

JUDGMENT PARTS

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Part 1: Overview and summary

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Overview

[1] In early November 2010 the bacteria known as Psa was identified as present in two neighbouring kiwifruit orchards in Te Puke, New Zealand.¹ Although there had been outbreaks of Psa affecting kiwifruit orchards in other parts of the world, this was the first time it had been identified in New Zealand. It was a virulent strain of the bacteria and its presence threatened the survival of the New Zealand kiwifruit industry.

[2] The initial strategy was containment with the ultimate goal of eradication. Orchardists with vines showing the symptoms cut out the area of infection and other measures, such as restrictions of access, cleaning machinery, and wearing protective footwear, were implemented. Despite these measures the bacteria spread to other orchards in the Te Puke region and beyond. The Hort16A variety of kiwifruit (at that time the predominant form of the “gold” variety being grown by orchardists) was particularly susceptible.

¹ The particular strain of Psa which caused the incursion has various names, the main ones being Psa-V or Psa3. I have used Psa3.

[3] It was a time of great uncertainty and stress for all those caught up in the outbreak. Orchardists were facing economic ruin. There was uncertainty for some about whether cutting out the vines, on which their hard work had been invested, was the appropriate thing to do. Personnel from the Ministry of Agriculture and Forestry (MAF) (as it then was), industry leaders and scientists in other organisations worked long hours responding to the incursion, assisting orchardists in various ways, testing samples from orchards, researching possible ways to combat or contain the disease, trying to determine how the incursion had happened and looking for ways to help the industry to recover from it.²

[4] At an early stage suspicion fell on Kiwi Pollen, a business involved in artificial pollination of orchards using milled pollen. That suspicion arose because Kiwi Pollen's milling operation was near the two orchards that were the first identified to have Psa symptoms and those two orchards had just finished being artificially pollinated with pollen and equipment supplied by Kiwi Pollen. It was a time of great stress for the Kiwi Pollen principals. MAF posted security guards at their gate for their safety.

[5] Industry participants, including orchardists, were unaware at this time that Kiwi Pollen had been granted a permit from MAF to import pollen from China. Pursuant to that permit, a consignment of kiwifruit anthers (the part of the plant that contains pollen) had received clearance at the border from a MAF inspector on 30 June 2009 and was shipped to Kiwi Pollen's premises in Te Puke that day. In the investigations which followed the incursion, suspicion fell on this shipment as the cause of the outbreak.

[6] Following the incursion the industry and Government agreed upon a funding package to compensate losses suffered by those affected. The compensation arrangements looked to assist with costs involved in cutting out and spraying vines, and to provide some compensation for lost production. However the arrangements were limited and came to an end before some orchardists could access them. Later,

² MAF is now the Ministry of Primary Industries (MPI). I have referred to MAF throughout for simplicity and because it was MAF, rather than MPI, when the principal events at issue occurred.

the industry recovered spectacularly well, but not necessarily in a way that compensated all those who had suffered loss in the interim.

[7] Horticulture is an inherently risky activity. It must contend with the vagaries of the environment whether that be adverse weather events or pests and diseases that arrive of their own accord or through no fault of anyone in particular. Biosecurity is complex and is not and cannot be infallible. The issue in this case is whether, if it can be shown that MAF was negligent in granting permission to Kiwi Pollen to import pollen or in granting clearance to the shipment of anthers, the loss suffered by orchardists or others should be borne by them, or whether the loss is more appropriately borne by the Crown as the party, through its servants, responsible for causing the loss.

[8] This proceeding has been brought by two claimants (the first and second plaintiffs). The first plaintiff (Strathboss) represents a class of orchardist owner operators as well as orchard lessors and lessees who suffered losses from Psa incursion. The second plaintiff (Seeka) is a post-harvest operator whose business depends on the supply of kiwifruit from orchardists. They contend that MAF owed them a duty to take reasonable care when granting Kiwi Pollen a permit to import kiwifruit pollen from China and when giving border clearance to the consignment imported pursuant to that permit. The plaintiffs say this case involves a straightforward application of well-established principles. They say it was MAF's responsibility to protect New Zealand's borders. They were aware for many years that Psa was a significant pest for kiwifruit that would cause economic harm to the industry participants. The plaintiffs say they were vulnerable and entirely reliant on MAF to carry out its functions competently. They say MAF failed to take reasonable care, this led to the Psa incursion and they suffered loss as a result.

[9] The Crown, represented by the Attorney-General, contends no duty of care was owed to the claimants.³ He says that biosecurity functions are not of a nature where the Crown should be held responsible for the consequences of biosecurity incursions

³ Because the Crown is represented by the Attorney-General, for ease of expression the judgment refers to submissions he made. Of course the submissions were made by counsel on his behalf and for and on behalf of the Crown.

when mistakes are made. He says MAF's duty is to the public as a whole and not to individual members or groups within that. He says the task is too complex, with competing policy considerations at play, and the potential consequences of a biosecurity breach are too great and too widely experienced to require compensation under negligence law principles. He also says that if the Court was to find a duty of care owed in this situation there is a whole raft of other Crown responsibilities that may cause significant losses and which may fall under a similar duty of care. He also says that the plaintiffs have not established MAF personnel failed to take care in discharging their responsibilities in this case and nor have they proven the incursion was caused by the anthers consignment. He says that even if the plaintiffs have succeeded in establishing all of these elements, then the Crown is totally immune by reason of a combination of specific and general statutory immunities.

Questions for determination at this stage

[10] The claim was divided into two stages. The hearing before me was stage one. The questions for determination at stage one relate to:

- (a) Whether MAF owed a duty of care to the plaintiffs (the duty question);
- (b) Whether MAF breached that duty of care (the negligence question); and
- (c) Whether the anthers consignment caused the Psa incursion (a causation question).

[11] These matters fall under the two specific questions that were set for my determination at this stage.

Question 1

[12] The first question was as follows:

Did MAF [MPI] owe a duty to:

- (a) Strathboss [the first plaintiff]; and/or
- (b) Seeka [the second plaintiff]; and/or

- (c) Members of the class represented by Strathboss

to exercise reasonable skill and care in any one or more of the respects identified in paras 122, 123, 124 and 128 of the statement of claim in its actions or omissions prior to the incursion of Psa-V into New Zealand to avoid:

- (a) physical damage to the property; and/or
- (b) economic loss resulting from damage to property; and/or
- (c) economic loss which did not result from damage to the property.

My decision

[13] I have found that MAF owed a duty of care to Strathboss to take reasonable skill and care in its actions or omissions prior to the New Zealand Psa incursion to avoid physical damage to property. It also owed a duty to take care to avoid loss consequential on that damage to property. The extent of consequential loss that is properly recoverable remains to be determined.

[14] I have found that MAF did not owe a duty of care to Seeka, in its capacity as a post-harvest operator, to take reasonable skill and care in its actions or omissions prior to the New Zealand Psa incursion to avoid economic loss to it.

[15] I have found that MAF owed a duty of care to some members of the Strathboss class to take reasonable skill and care in its actions or omissions prior to the New Zealand Psa incursion to avoid physical damage to property. It also owed a duty to take care to avoid loss consequential on that damage to property. The extent of consequential loss that is properly recoverable remains to be determined. The members of the Strathboss class who have sufficient property rights to be within the class to whom the duty is owed is yet to be determined but does include those who were both owners and operators of orchards whose vines suffered damage.

Question 2

[16] The second question was as follows:

- (a) Did Psa3 [Psa-V] enter New Zealand as pleaded in paras 110 to 121 of the statement of claim; and if so

- (b) did MAF [MPI] breach the duty of care by acts or omissions in the manner identified in paras 125 and 129 of the statement of claim; and if so
- (c) did any breach of the duty of care cause Strathboss's kiwifruit vines to become infected by Psa3 [Psa-V]?

My decision

[17] I have found that Psa entered New Zealand through the anthers consignment imported pursuant to the permit granted to Kiwi Pollen by MAF.

[18] I have also found that MAF breached its duty of care by acts or omissions at the pre-border stage when granting import permits to Kiwi Pollen. I have found the plaintiffs have not established that reasonable care by MAF at the clearance stage would have stopped the anthers consignment from reaching its destination at Kiwi Pollen.

[19] It was accepted by the Crown that Strathboss had proven that its vines were infected as a result of the Psa incursion first identified in 2010.

Parts to this judgment

[20] This judgment starts by setting out some factual and regulatory background (Part 2: Factual and regulatory background). It then discusses whether a duty of care is owed by MAF to the claimants (Part 3: Duty). It then discusses whether MAF breached that duty of care. This is in two parts. First, it concerns MAF personnel acts or omissions at the pre-border stage which led to the import permit being granted and its actions or omissions in responding to a similar and earlier Psa outbreak in Italy (Part 4: Breach – first cause of action). The second part of this aspect concerns whether MAF breached a duty of care at the border stage when clearing the consignment of anthers (Part 5: Breach – second cause of action). It then discusses whether the Psa incursion came from the consignment of anthers (Part 6: Causation). Lastly, it discusses whether the Crown has an immunity to the claim (Part 7: Crown immunity). There is also an appendix providing details of the expert witnesses.

Summary of reasons

Part 3: Duty

[21] Whether a duty of care is owed by MAF personnel to take care in carrying out their biosecurity functions relating to the importation and border clearance of risk goods has not been decided by the New Zealand courts before. However the Supreme Court has determined the methodology to be applied in new situations (as this case is) to decide this question. This methodology involves: an internal inquiry into whether the loss was reasonably foreseeable by the defendant and whether there is a sufficient connection (“proximity”) between the parties to warrant a duty; and an external inquiry into policy considerations in order to decide if a duty would be fair, just and reasonable for society and the law generally.

[22] This case involves a claim for economic loss, partly arising from and consequential to property damage and partly not, allegedly caused by the actions or omissions of a public body tasked with complex biosecurity statutory functions. In applying the methodology in this case there are established principles that are relevant. First, the principles that apply to whether a duty of care is owed by a private person apply equally to a body performing public functions. There are no special rules unless the statute under which the public body has acted excludes a duty of care. Secondly, although there are no special rules because this case concerns biosecurity, the nature of the public body’s functions are relevant to whether a duty of care arises. Thirdly, where a claim is for economic loss unrelated to property damage, that is a factor that can point against a duty of care. Fourthly, where a claim is for a failure to act (an omission) rather than a positive act, special rules apply before a duty can be owed.

[23] I have concluded the features in this case support a duty of care to those who have “property rights” in the vines or the crops where the vines were infected with Psa3 or treated as though they there were infected. In summary those features are:

- (a) They have suffered physical damage (to their vines and crops) from harm directly caused to their property.

- (b) The harm suffered was from a risk (a harmful kiwifruit pathogen) over which they had no control and for which they had to rely on MAF for protection.
- (c) MAF had responsibility for controlling that risk and had powers to control the entry of the risk goods into New Zealand (both pre-border and at the border) as well as powers for responding to the risk from a harmful plant pathogen once its presence in New Zealand is known.
- (d) The particular risk in this case, Psa in kiwifruit plant material, was known to MAF.
- (e) It was obvious that if kiwifruit plant material was allowed to be imported without a proper assessment of the conditions on which it could be imported and, if that plant material was intended to be applied to kiwifruit orchards, the vines and crops on those orchards were at risk of harm.
- (f) It was also obvious that if pollen was not free of plant material or other contaminants and was to be used commercially to artificially pollinate kiwifruit orchards, the vines and crops of those orchards were at risk of harm.

[24] Proximity is therefore established and a duty of care should be found to exist unless it would not be in the public interest to recognise the duty.

[25] The countervailing policy factors in this case are not sufficient to negate the duty because:

- (a) Concerns about indeterminate and disproportionate liability if a duty of care is recognised in this case make assumptions about the consequences that will follow. The elements of negligence involve inquiries that work together and serve to restrict its application to proper cases and within proper limits.

- (b) If a duty of care is imposed, the costs will ultimately be borne by the New Zealand public, through taxes which will pay for insurance if and to the extent it is available or more directly if it is not. There is, however, a societal benefit if members of the New Zealand public, who have suffered loss from the negligence of a government body, receive compensation for that loss.
- (c) The protection of New Zealand's border is in the national interest. New Zealand government bodies and industries have an interest in working together to find an efficient and effective means to protect the border and to allocate the costs of that protection and the responses to biosecurity breaches when they happen.
- (d) The existing accountability mechanisms that help to ensure careful and proper biosecurity decisions are made leave unfilled gaps. They did not protect the plaintiffs.
- (e) A duty of care is not likely to create overly risk averse behaviour by public servants with biosecurity responsibilities because of the range of other interests that are involved.

[26] In all the circumstances it is just, fair and reasonable that MAF has a duty of care to those within the class represented by Strathboss who have suffered loss to their property. The wrong to them should be remedied.

[27] I have reached a different view in relation to Seeka's claim as a post-harvest operator. It has suffered loss because of its business relationships with growers. That is relational economic loss. It is different in kind to property damage and more removed from the immediate consequences of the alleged negligence in this case. This means that the connection between Seeka and MAF is less close. Seeka's losses are not of a kind that are sufficiently distinct from others who suffered economic losses in some way because orchard production was affected by Psa. There are also issues about whether it is more appropriate that Seeka, rather than the government and ultimately the New Zealand public, bear losses arising from adverse events in kiwifruit

production whatever their cause. Therefore I have not been persuaded that it is just, fair and reasonable for MAF to owe a duty of care to Seeka as a post-harvest operator.

[28] I have left for determination at stage two of this case who in the Strathboss class falls within the group to whom the duty is owed. Those within the Strathboss class will have to show they had property rights in the vines and crops or that their interest in the vines and crops is sufficiently direct or closely associated with those rights that they should be treated as though they have suffered loss to their property. The duty of care applies to the consequential financial losses from that property damage for those that are in that class but will be subject to the limits of causation, remoteness, mitigation and betterment.

Part 4: Breach – first cause of action

[29] The plaintiffs have established MAF personnel breached a duty of care to them in some of the ways alleged. The breaches fall into three categories.

[30] First, the problems arose from a review of pests and diseases associated with pollen (called the PHEL Review). The scope of this review was not clearly set or clarified as between the principal author and the MAF scientist who was supervising the principal author. This meant that relevant literature about the association of bacteria with pollen was omitted. It also overstated the conclusion that could be drawn about pollen and bacteria generally from the one reference on which it was based. That reference concerned a subset of bacteria that is transmitted differently to bacteria generally. The review was misleading about the association of bacteria and pollen given it was based only on a particular mechanism of pollen transmitted pests, it was not clear that the review was concerned only with pollen used as a germplasm and it assumed that pollen would be “pure” and free of extraneous material.

[31] Secondly, this review was provided to the MAF plant imports team to assist in deciding on Kiwi Pollen’s permit application. When that happened, the conclusion in the review in relation to *Actinidia* (kiwifruit) was inaccurately conveyed and provided without it being noticed that the use to which the pollen would be put was different to that on which the review was premised.

[32] Thirdly, normally for a new type of import of risk goods, as Kiwi Pollen's pollen import request was, a formal risk analysis sign off by MAF personnel would be required. That would involve consultation on the application or otherwise making sufficient enquiries about the pollen milling process. That did not occur.

[33] These errors were not on matters requiring difficult questions of scientific judgment or competing policy considerations on which reasonable experts or advisers could differ. They were largely in the nature of process errors – that is, not following usual procedures, not being clear about the scope of a document to be relied on for determining whether risk goods should be permitted, and not adequately checking the context in which the document was to be relied upon.

[34] Other matters relied on by the plaintiffs did not amount to negligence or were not shown to have been of consequence.

Part 5: Breach – second cause of action

[35] The plaintiffs' second cause of action alleges that a MAF inspector at the border was negligent in clearing the anthers consignment imported pursuant to a MAF import permit. The plaintiffs say that if inspection was carried out then it was negligently done because it failed to discover that the consignment contained anthers and not the permitted pollen. Further, they say that if inspection was not carried out then this was negligent in and of itself because inspection was required by the legal and regulatory framework under which the inspector acted.

[36] First, on the evidence, I found it was more likely than not that inspection did not actually take place before the consignment was cleared. Secondly, I found there was no breach of duty in failing to visually inspect the contents of the consignment because this was not required by the Biosecurity Act nor the import permit. I found the discrepancies in the documentation accompanying the consignment should have led to the issuance of a non-compliance report. However I considered the plaintiffs had failed to show, on balance, that this would have led to the consignment being inspected, destroyed or returned rather than being cleared and dispatched to its destination in Te Puke.

Part 6: Causation

[37] In my view MAF's approach on this aspect of the case was looking for proof that the anthers consignment caused the incursion to the level of scientific certainty. Proof to that level is rarely possible when dealing with the reconstruction of past events. This is all the more so when the cause of the outbreak was caused by a pathogen about which not an enormous amount was known before the global pandemic. Proof to absolute or scientific certainty is not required in a civil case. On the contrary, the approach to be taken in a case like the present is to gather together all the properly established strands of circumstantial evidence and then to stand back and ask the ultimate question of whether the plaintiffs' explanation is more likely than not to be true.

[38] In this case, the plaintiffs properly established the following evidence:

- (a) any Psa3 contained in the anthers consignment when it left Shaanxi was likely to have survived the shipping to Kiwi Pollen and the cycloning process;
- (b) there were a number of possible pathways for any Psa3 contained in the anthers consignment to be conveyed to the two orchards at which the first Psa symptoms were discovered;
- (c) those two orchards were likely the epicentre or ground-zero of the New Zealand Psa3 outbreak based on the epidemiology of Psa3, the fact those orchards were the first to report symptoms, the advanced nature of the symptoms at those two orchards and the analysis of the spread;
- (d) the timing of symptom expression in Te Puke is consistent with each of the possible pathways based on the expert evidence;
- (e) based on the genetic evidence, considered in the context of other relevant information, it is probable that the origin of the New Zealand incursion is China and it is also quite possible and plausible on the

genetic evidence that it came from Shaanxi, the province from where the anthers consignment came;

- (f) a second shipment of pollen imported by Kiwi Pollen from China around a year later also tested positive for Psa;
- (g) there is no other known source for the incursion. Other conceivably possible pathways are unlikely and there is no evidence to suggest they in fact happened.

[39] Taken together, the strands of circumstantial evidence go beyond conjecture or coincidence and mutually support the overall inference that it is more likely than not that the anthers consignment contained Psa3 and that this ultimately caused the outbreak of the disease in New Zealand.

Part 7: Crown immunity

[40] The defendant submitted that the Crown had a complete defence to the claim because all the relevant MAF personnel have the benefit of an immunity under s 163 of the Biosecurity Act. This in turn meant that the Crown was not liable because of s 6 of the Crown Proceedings Act 1950 (CPA). The plaintiffs said that negligence was not covered by the s 163 immunity and that, even if it were, the Crown would be liable when s 6 of the CPA was read consistently with s 27 of the New Zealand Bill of Rights Act 1990.

[41] I found that s 163 of the Biosecurity Act did not apply to MAF personnel's acts or omissions leading to the granting of the import permits to Kiwi Pollen (the first cause of action). This meant the Crown does have liability for the acts or omissions of MAF personnel under the first cause of action. I found that s 163 did apply to the MAF inspector who cleared the consignment (the second cause of action). However, because this cause of action was not established, the Crown did not have liability for his actions regardless of the correct interpretation of s 6 of the CPA.

Part 2: Factual and regulatory background

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Introduction

[42] This part of the judgment provides an overview of factual matters which provide some background context for the matters discussed in the other parts of the judgment. It also includes an overview of the legal and regulatory framework under which biosecurity in New Zealand is managed.

The kiwifruit industry in New Zealand

Industry size

[43] The kiwifruit industry has been a significant industry in New Zealand for around 40 years. New Zealand is the third largest kiwifruit producer in the world after China and Italy. China's kiwifruit production is consumed by their domestic market. It has very little export presence. Italian growers operate a low cost model and, with a large market at their doorstep, volume tends to be the key driver of value.⁴ New Zealand, which has significant distance to its markets, in comparison occupies the premium position of the market. The vast majority of New Zealand grown kiwifruit is exported. In 2015 kiwifruit was New Zealand's second largest horticultural export after wine, earning export receipts of \$1.2 billion. Export receipts in 2009 were approximately \$1.072 billion.

Participants

[44] At present there are around 2500 growers operating on around 3200 registered orchards in New Zealand. It is a highly concentrated industry in that by 2015 total production was squeezed onto 11,000 hectares of orchards (0.041 per cent of New Zealand land), predominantly in the Bay of Plenty and concentrated in Te Puke. The average size of an orchard is a little under four hectares, although some orchards are small lifestyle blocks and some are much larger commercial operations. The orchards are owned by individuals or through companies, trusts, partnerships and Maori land trusts. Some orchards are owner operated. Others are operated under lease. The average age of a kiwifruit grower in New Zealand is around 58 years old.

⁴ Growers tend to be multi-generational landowners with land that is debt-free and, outside of Latina, Italians tended also to be multi-crop growers.

[45] New Zealand has a “single desk” export arrangement for kiwifruit through Zespri International Ltd (**Zespri**). Zespri’s shares are owned by past and present kiwifruit growers. All owners are eligible to buy shares. Lessees of kiwifruit orchards are also eligible to buy shares after a year. There is no limit to the number of shares owners and lessees are eligible to buy but they must find a willing seller to buy shares from. There is no requirement to sell shares when leaving the industry but ex-owners and lessees cannot purchase new shares. Nor can they vote at a Zespri Annual General Meeting. Voting is restricted to shareholders who are currently producing kiwifruit and their voting power is a combination of voter’s shares and production.

[46] Zespri is governed by regulations.⁵ Kiwifruit New Zealand (**KNZ**) is the regulator under the regulations. Under the “single desk” arrangement Zespri has an almost complete monopoly on the marketing of kiwifruit outside of New Zealand and Australia. The exception is collaborative marketing mechanisms authorised by KNZ which account for around 2 per cent of sales each year. Zespri also grows kiwifruit in five countries. This includes Italy. Zespri accounts for 30 per cent of global kiwifruit sales. It has sales and marketing capacity in 53 countries.

[47] Zespri is a MAF approved organisation (**MPO**) for inspecting and clearing its kiwifruit for export. In this capacity it is authorised to undertake certification services on behalf of MAF, which are called **Phytosanitary Certificates** (discussed further elsewhere in this judgment). These certificates provide importing countries with an official assurance that the product meets that country’s requirements. They are issued in accordance with international standards.

[48] In 1993 kiwifruit growers established New Zealand Kiwifruit Growers Inc (**NZKGI**). This was at the time of a significant downturn in the industry. NZKGI advocates for growers, undertakes a range of grower representation and education and is a watchdog over Zespri. It was previously funded by Zespri but is now funded through a grower levy. It has monthly meetings which Zespri attends. Grower representatives are appointed to the NZKGI forum. There is also an executive committee.

⁵ The Kiwifruit Export Regulations 1999.

[49] Another key group in the industry are the registered suppliers. A supply entity is a group of growers supplying to a post-harvest operator (**PHO**). The supplier entities are separate from the PHOs. It is the registered suppliers who sign the supply agreement with Zespri. Finalising the supply agreement is typically achieved at the Industry Advisory Council (**IAC**), an industry grouping made up of five representatives from each of NZKGI, registered suppliers and Zespri. The former Chief Executive Officer of Zespri, Lain Jager, described these layers coming together at the IAC as creating “a highly nuanced, balanced, sophisticated, complex and extremely participative industry”.

[50] The PHOs are another key group in the industry. PHOs contract with the supplier entities.⁶ They provide kiwifruit grading, packing and coolstore services before the fruit is sent to the docks for shipment to overseas markets by Zespri. Some PHOs arrange for the picking of fruit on orchards (which is typically done by gangs of contractors) and for the transport of the fruit to the packhouse. They may also provide other orchard management services to growers.

[51] The PHO sector is highly competitive. There are six major PHOs which account for about 85 per cent of the market share. In 2010, before Psa was found in New Zealand, EastPack Ltd (**EastPack**) and Seeka Ltd (**Seeka**) made up approximately 40 per cent of the PHO market. Satara Co-operative Ltd accounted for 10 per cent. Satara has since amalgamated with EastPack. EastPack is currently the largest PHO. It has around 26 per cent of the market. It has around 250 permanent staff members and seven packhouses (including the largest packhouse in the world which is located in Te Puke). Most PHOs have some form of direct grower-ownership. Seeka, which is a publicly listed company, is the exception to this.

[52] Some PHOs lease orchards. Three year leases are the most common. Long term leases, up to 20 years, have also been used. EastPack has a small leasing portfolio

⁶ Anthony Hawken of EastPack, the largest PHO, refers to “grower entities” which he says can be one and the same as Mr Jager’s description of “supplier entities”. He also refers to supply entities which manage the logistics of getting packed fruit to the dock. I have referred to supplier entities only for simplicity and because, where there is a distinction, it does not have any particular relevance for present purposes.

compared with some other PHOs. Its leasing portfolio is smaller than its management portfolio.

[53] After the Psa outbreak Kiwifruit Vine Health (**KVH**) was established. There was Zespri representation on KVH when it was first established. KVH is now funded by a levy on growers.

Orchard production returns

[54] Production is impacted by a number of factors. Weather is one factor: in any given year, weather, frosts, badly timed hail and other environmental factors may influence production. Orchard management is another factor: for example, pollination, plant nutrition, bud break and canopy management can influence production.

[55] The export price depends on factors such as fruit market conditions generally (that is, the production of apples, bananas and summer fruits in any season), kiwifruit industry supply factors, global economic conditions, any impediments to market access and the strength of the New Zealand dollar relative to sales market currencies.

[56] Zespri allocates each orchard a unique Kiwifruit Property Identification Number (**KPIN**). This enables Zespri to track the source of the fruit and to return payments to the appropriate grower. Generally Zespri makes payments to the supply entities that growers are contracted to. These payments are comprised of fruit, service and incentive payments. From Zespri's perspective, a grower's fruit and service payment depends on the class of fruit, taste, the pest status of the fruit, when the fruit is picked and supplied to Zespri and fruit loss. The supply entities distribute the payments to their growers in accordance with their supply agreements.

[57] The basic unit of calculation is a "tray". For example, "this hectare of green kiwifruit is returning 9,000 trays". PHO costs are also calculated per tray. Grower returns can be measured by the "Orchard Gate Return" (**OGR**). This is the total amount of money that flows to the growers prior to the payment of on-orchard costs (that is, Zespri's fruit and service payments less off-orchard costs such as post-harvest costs).

Varieties

[58] There are different species of kiwifruit and, within that, multiple cultivars. The green varieties are typically the *deliciosa* species. The gold and red varieties are typically the *chinesis* species. Baby kiwifruit, typically the size of large grapes and sold in a punnet, are the *arguta* species.⁷

[59] At the time of the Psa outbreak in 2010 there were two predominant varieties of Kiwifruit being grown commercially: Hayward (green) and Hort16A (gold). The Hayward was the most common variety.

[60] Plant & Food have a breeding programme for the development of new cultivars.⁸ Breeding a successful new cultivar involves about a ten year long process which is then followed by a pre-commercial block trial. If that is successful the cultivar may then be commercialised. New cultivars are subject to Plant Variety Rights (**PVRs**).

[61] The Hayward has been grown for a long time and is not subject to a PVR. Anyone can choose to grow it. Hort16A was subject to a PVR held by Zespri. The PVR provided Zespri with the exclusive right to produce the variety for sale. It also allowed Zespri to license others to do so.⁹ The PVR for Hort16A in New Zealand was due to expire on 18 November 2018. At that time, all grower rights under licences, would also terminate. At this time it would become a public variety meaning that, like Hayward, there would be no constraint on planting it.

[62] Hort16A turned out to be particularly susceptible to the strain of Psa responsible for the incursion that is the subject of this litigation.¹⁰ As a result, Zespri decided to roll out early one of the new cultivars, Gold3 (G3) also known as SunGold, which it had been growing in pre-commercial trials.¹¹ In 2012 Zespri offered licences

⁷ The *arguta* species has only recently being commercialised in New Zealand.

⁸ As I understand it, this is part of a Zespri breeding programme which is carried out with the assistance of Crown funding.

⁹ Hort16A demanded a premium price as a new and attractive eating fruit. It also had a better yield than green kiwifruit. It therefore obtained a higher return per hectare.

¹⁰ As set out in Zespri's 2011/2012 annual report, around 800 hectares of Psa-infected Hort16A canopy would have been cut out by the end of the 2012 harvest.

¹¹ In the 2011/12 season there was a small amount of (G3) being grown in pre-commercial trials and sold as part of the gold pool.

to enable growers to switch to the G3 variety. The G3 variety has been successful and, as at 2017, 39 per cent of New Zealand orchards are gold kiwifruit.

Growing kiwifruit

[63] Kiwifruit vines have four key parts: the trunk, the leader, the cane and the shoot. The vines are grown on a support structure. The diagram illustrates this:

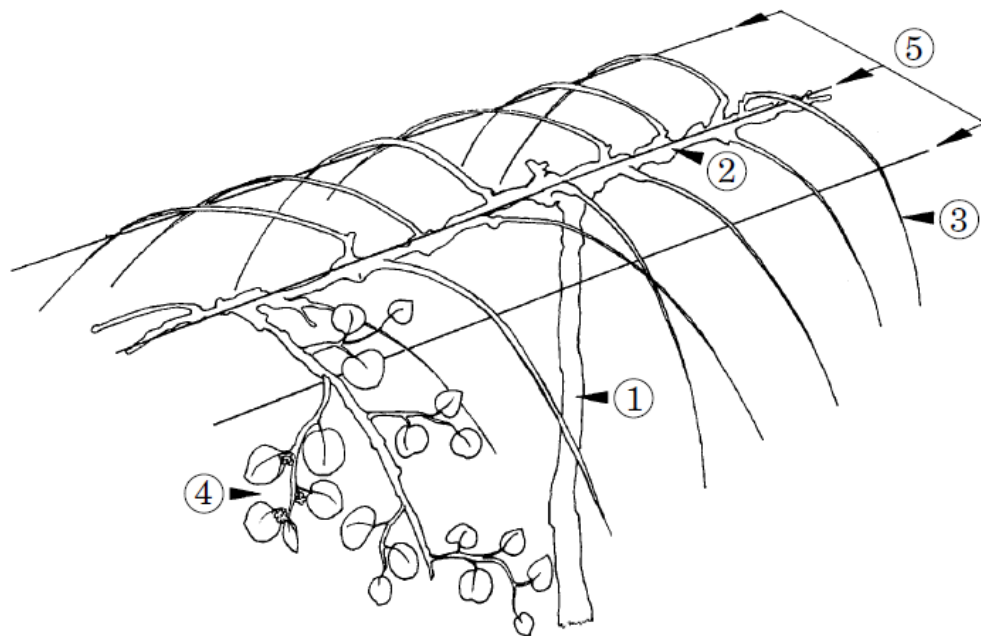


FIG. 1. Schematic of mature kiwifruit vine showing the trunk (1), leaders (2), canes (3) and shoots (4). The wires of the support structure (5) are also shown.

[64] The New Zealand kiwifruit growing season is as follows:

- (a) The season begins in winter following the previous year's harvest in autumn. Kiwifruit vines are dormant during winter and this allows the growers to carry out management such as winter pruning, bud-break spraying, soil testing, base fertiliser dressing, scale control and nitrogen fertilisation.
- (b) Springtime begins with vine growth and shoots begin appearing on the canes along with bud-burst, flowering and pollination. Growers carry

out male and girdling-root pruning, thinning and various types of spraying.

- (c) As summer starts, vines undergo significant growth and orchardists undertake regular pruning to direct growth and manage the canopy. Fertiliser side dressing, irrigation and pest monitoring and control are important during this season. The fruit grows quickly during summer and crop estimations can be undertaken. Growers will selectively thin kiwifruit to optimise the size and taste of the fruit.
- (d) Finally, as the weather cools in autumn, harvest time approaches. Growers will test their fruit for ripeness through maturity monitoring and area selection. This is important for ensuring that the fruit meets certain criteria for quality and grade. The season ends with the careful picking, transport and packing of the fruit. During this period trunk girdling and root pruning occurs, cicada and PVH sprays are applied and steps are taken to minimise the coming frost risk in winter.

Pollination

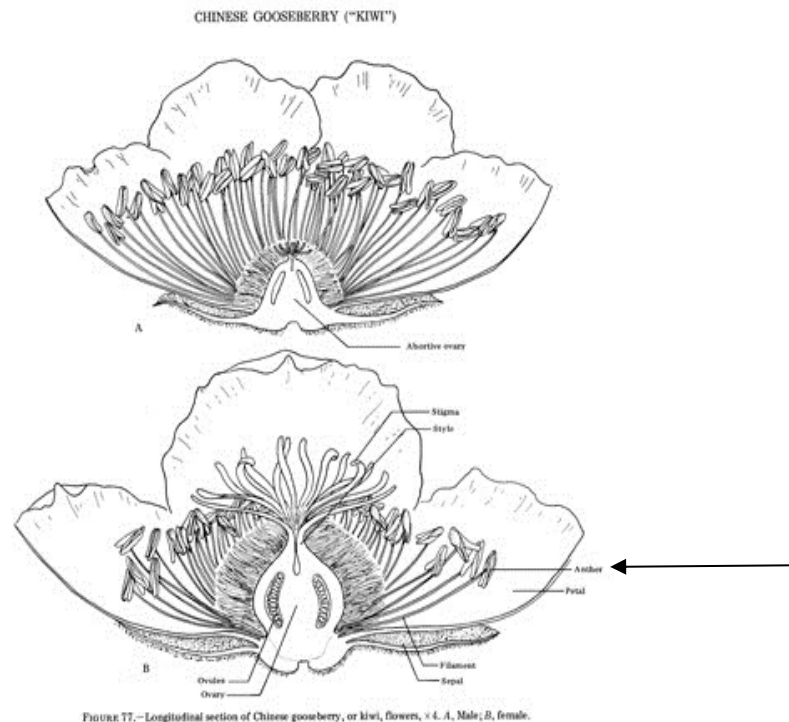
*The pollination process*¹²

[65] Kiwifruit have both male and female vines. Kiwifruit are produced by female vines. Each female flower bud is capable of producing fruit but will not do so unless pollinated by pollen from a male vine's flower. The layout or distribution of male vines in a New Zealand orchard varies but typically occupies around 10 per cent of the canopy area.¹³

[66] The pollen of the male flower is contained in "anthers". Anthers can be seen in the image below.

¹² This section comes from the plaintiffs' helpful discussion in opening submissions about which there was no dispute.

¹³ In other countries, such as Korea and Japan, orchards are 100 per cent female and growers undertake artificial pollination to produce fruit.



[67] Anthers open and release their pollen when climatic conditions (moisture levels and heat) are suitable for pollination. Pollen is transferred from the male flower to the female flower by wind, bees and other insects, and birds. The pollen adheres to the sticky stigma of female flowers, which attract pollinators by producing anthers and pseudo-pollen. The base of a pollinated female flower is what develops into a kiwifruit.

Bees

[68] The timing of flower production in commercial orchards can be controlled to an extent. In New Zealand a product is typically sprayed onto vines to stimulate bud production (or “bud break”). Control enables predictable flowering and fruiting. After bud break, orchardists typically have beehives delivered to their orchards to assist pollination. The bees remain in the orchard while the vines are in flower.

Artificial pollination

[69] Some orchardists use artificial pollination. This involves spraying pollen which has been extracted from male flowers on or near female vines. Artificial pollination can be applied wet or dry. Wet pollination involves mixing kiwifruit pollen

with water then spraying the female flowers individually. It is labour intensive. Dry pollination involves blowing pollen into the air around the kiwifruit vines. It is less labour intensive and therefore cheaper.

[70] Artificial pollination is a relatively widespread practise in the kiwifruit industry. Kiwifruit need to meet a certain range of seeds in the fruit to qualify as export grade. The number of seeds is caused by the number of successful instances of fertilisation from pollination. Artificial pollination can assist the natural pollination of female vines carried through bees. Moreover, the Court heard evidence that both Japan and Korea depend heavily on pollen imports due to the practise there of only growing female fruit-bearing vines. There is, therefore, a market for pollen and pollination services. New Zealand industries are involved in this market. Seeka, for example, is involved in pollen production and supplies pollen to its growers.

[71] Following the Psa3 incursion, most pollen collected from New Zealand kiwifruit vines carries viable Psa3. The exception is the South Island, which is Psa3-free at present. The total production of pollen from the South Island is not sufficient to sustain internal New Zealand demand, let alone export demand.

*Milling of pollen*¹⁴

[72] Pollen is extracted from male flowers via a milling process. That process is:

- (a) Flowers are hand-picked from male vines.¹⁵
- (b) The flowers are put through a series of rotating mills that cut them, exposing the anthers. The flower parts drop into a rotating mesh drum that rips the anthers from their stalks. The anthers and similar sized flower and plant parts fall through the mesh and into a tray, while the balance of the flower parts fall out the end of the mill.

¹⁴ This section also comes from the plaintiffs' helpful summary provided in opening submissions and confirmed by the evidence.

¹⁵ Another method of collecting flowers is by vacuum.

- (c) The flower parts that did not fall through the mesh are put through further mills, to extract more anthers. Again, anthers and similarly sized flower and plant parts fall through the mesh and into a tray.
- (d) Any flower parts that have not fallen through to a tray are then discarded.
- (e) The trays of anthers and other small flower and plant parts are placed into drying cabinets for 18 to 20 hours.
- (f) Pollen is extracted from the dried anthers by putting them through a cyclone machine. Pollen is deposited in a jar that is attached to the cyclone. The anthers are typically disposed of.
- (g) Milled pollen is not 100 per cent pure. It inevitably includes small pieces of other flower and plant material, as well as dust and dirt which is a similar size to the pollen.

Kiwi Pollen

[73] Kiwi Pollen is owned by Ms Hamlyn and Mr Crawshaw who are married. Ms Hamlyn is the managing director and oversees its activities. Kiwi Pollen has been operating since about the early 1990s. It specialises in kiwifruit pollination. It services both certified organic and conventional kiwifruit growers.

[74] It offers kiwifruit pollen, dry and wet pollination systems and PollenAid technology.¹⁶ Prior to the Psa outbreak Kiwi Pollen carried out dry pollination via a four-wheel drive motorbike which had three blowers mounted onto the front. These blowers could be rotated by the driver of the vehicle. The other way dry pollination could be carried out involved a person on a motorbike holding a single blower and moving it around.

¹⁶ This is a buffer solution that maintains the pollen in a viable state.

[75] Part of Kiwi Pollen's business involved milling pollen. For its milling business, male flowers were sowed from New Zealand orchards, which Ms Hamlyn and Mr Crawshaw (or entities associated with them) owned or leased.

[76] Kiwi Pollen leased a building at Main Road, Te Puke (the **Main Road premises**). This building is more than seven km away from Kairanga orchard which is owned and operated by Mr Crawshaw. The building was leased from Tony Moore, who was a kiwifruit orchardist. The building was adjacent to his orchard. Initially Kiwi Pollen carried out milling at this building. After that, the milling took place at various locations around Te Puke. The last of these temporary locations was an old kiwifruit pack house at No 3 Road, which was owned by Bob Burt.

[77] In February 2009 Kiwi Pollen purchased a building at Te Matai Road, Te Puke (the **Te Matai Road shed**). It is on the corner of Te Matai Road and Mark Road. It was very close to Ms Hamlyn and Mr Crawshaw's home and their kiwifruit orchard at 36 Mark Road, Te Puke (**Kairanga**). It is also close to 37 Mark Road, Te Puke (**Olympos**), the orchard immediately across the road from Kairanga, which was owned by Russell West and operated by his brother, Peter West. Olympos was the first orchard to report symptoms that tested positive for Psa.

[78] The milling operations were moved to the Te Matai Road shed when it was purchased. The mill was commissioned around August 2009 and the first milling season commenced after that. Kiwi Pollen milled at this location each year after that.

[79] Kiwi Pollen sold the milled pollen to both domestic and international customers. This part of the business was carried out in the pollen room at the Main Road premises (the **pollen room**) until 2011 at which time this part of the business also moved to Te Matai Road shed. It involved storing, managing, testing and distributing the pollen.

[80] The pollen business was busiest from around September to April each year. Artificial pollination of female vines would take place in October and male flowers were ready for harvest and milling during November. February to April was when pollen was exported to overseas customers.

[81] During the milling season, the mill would operate through the night. The pollen would be delivered frozen to the pollen room at Main Road (when this building was leased). The next day it would be counted, weighed, inspected, tested, labelled and stored in a freezer before being dispatched to customers. Ms Hamlyn carried out some of this work. Kiwi Pollen also employed a pollen manager to carry it out. The manager was Jan Mitchell from around 1995 until about March 2009. It was then Amanda Lyons from August 2009 until the shift to Te Matai Road in 2011.

[82] Kiwi Pollen also began to import pollen. Imports needed MAF approval (discussed further below). Kiwi Pollen obtained a number of permits but these were not always used. During the period at issue in this proceeding it imported pollen from Chile and China. There were two consignments from China. The first consignment arrived in New Zealand on 24 June 2009 and was received by Kiwi Pollen shortly after it was cleared at the border on 30 June 2009 (**the June 2009 anthers consignment**). The second consignment from China arrived in New Zealand on 6 June 2010 and was received by Kiwi Pollen shortly after it was cleared at the border on 16 June 2010. The unviable pollen from this second consignment tested positive for Psa. It is the June 2009 anthers consignment which the plaintiffs say led to the Psa3 outbreak in New Zealand.

Psa

What is Psa?

[83] Psa is a bacterium that causes damage to kiwifruit vines. The scientific name of Psa is *Pseudomonas syringae* pv. *Actinidiae*. The species is *pseudomonas syringae* which can affect about 300 different plant species. The species is grouped into about 50 pathovars (being a group of strains which cause the same symptoms and affect the same plant species), of which *Pseudomonas syringae* pv. *Actinidiae* is one. *Actinidiae* refers to kiwifruit.¹⁷ Within a pathovar there can be several strains (or biovars) of Psa.

¹⁷ There are other *pseudomonas* pathovars that affect kiwifruit.

[84] The present scientific understanding, based on genetic analysis, is that Psa falls into the following biovars or groups:¹⁸

- (a) Psa1 (also referred to as Psa-J): a group of strains isolated in Japan in the 1980s and 1990s and Italian strains from 1992.
- (b) Psa2 (also referred to as Psa-K): Korean strains isolated in 1997 and 1998.
- (c) Psa3 (also referred to as Psa-V): a group of strains isolated from Italy, New Zealand, Chile and China. It has also been found in other parts of Europe and in Japan and Korea.
- (d) Psa4 (also referred to as Psa-LV or Pfm): a strain isolated in New Zealand and Australia which is genetically quite distinct from the other three types.
- (e) Psa5 and Psa6:¹⁹ strains isolated from Japan.

[85] The Psa3 strain can be separated into further groups: pandemic and divergent. China has both groups. The New Zealand, European and Chilean Psa3 strains fall into the pandemic group. The pandemic group of Psa3 is a virulent strain. Psa4 is of low virulence and is now regarded as being a different pathovar to Psa3.²⁰

Survival and spread

[86] Psa is a bacteria associated with kiwifruit. It is a simple organism that will survive if there is sufficient moisture, nutrients and warmth. It can reproduce clonally,

¹⁸ JR Chapman, RK Taylor, BS Weir, MK Romberg, JL Vanneste, *et al* “Phylogenetic relationships among global populations of *Pseudomonas syringae* pv. *Actinidiae*” (2012) 102 *Phytopathology* 1034-1044 [*Chapman et al (2012)*] compared the DNA sequences of multiple loci (MLST, a method of analysis that looks at parts of the genome rather than the whole genome) from strains of Psa from various countries. Their phylogenetic analysis indicated that Psa could be sorted into four different groups (Psa1, Psa2, Psa3 and Psa4).

¹⁹ Subsequent to Chapman *et al* (2012), Sawada *et al* (2014) and Sawada *et al* (2016) have since identified isolates of Psa that fall into two further MLST types named Psa5 and Psa6.

²⁰ This strain is now considered to be sufficiently different from Psa3 that it is no longer regarded as a different biovar of the same pathovar as Psa3, but rather is regarded as a different pathovar and hence the change to Pfm or Psa-LV (*P.syringae* pv. *actinidifolioum*) terminology.

meaning that a single bacterial cell can rapidly multiply from one cell to more than 2 million cells in seven hours.²¹

[87] The Psa3 bacteria can survive on the outside of the plant (“epiphytically”) before infecting it. It infects the interior of the plant through natural openings in the plant surface or through wounds such as those caused by pruning, wind or rain damage to leaves, and insect damage. Psa3 will also infect plants through flowers when they are open for pollination.

[88] Psa3 bacteria can spread between vines in any number of ways: by wind and rain, pruning equipment, insects (including those that bite into kiwifruit vines, such as cicadas and leaf hoppers), birds, bees, and other pollinators. It can also live in soil, prunings and leaf litter for a period and be carried from orchard to orchard on the soles of shoes and tyres of vehicles. From there the opportunity arises to infect vines where the necessary physical proximity occurs (be it from contact with the vine or transfer by wind, rain, or other external means).

[89] Psa3 bacteria adheres to pollen grains. It is inactive below 0 °C and can survive at sub-zero temperatures without nutrients and moisture. That is why pollen that has been frozen for years can still test positive for Psa3.

[90] Psa3 bacteria multiplies in favourable conditions. When it is mixed with an application solution and applied to a flower, it will have conditions in which it can multiply. The application of artificial pollen has been confirmed as a means of spread of Psa3. Recent Psa3 outbreaks in Japan and Korea are regarded as having originated from New Zealand pollen imports.²²

Symptoms

[91] A plant’s response to a bacterial invasion is expressed through symptoms. The same symptoms can be caused by different pathogens and this makes diagnosis on the

²¹ KVH, N. 667, “Survival of Psa” (October 2011) referred to by Giorgio Balestra (an expert witness in this case).

²² For example: Gyoung Hee Kim *et al* “Outbreak and Spread of Bacterial Canker of Kiwifruit caused by *Pseudomonas syringae* pv. *Actinidiae* Biovar 3 in Korea” (2016) 32(6) *Plant Pathology Journal* 545.

basis of symptoms alone inaccurate. The first visible symptoms of Psa are often leaf spots (angular leaf spots with chlorotic halos). This is the plant recognising the infection and responding by killing the cells around the point of infection. The plant kills the cells to contain the infection because Psa needs live tissues to survive.

[92] Secondary symptoms are caused when Psa has invaded the internal tissues of the plant. Secondary symptoms may be:

- (a) Cane dieback: this is caused when the bacteria blocks the xylem vessels and prevents the cane from obtaining water and nutrients. The cane therefore wilts and dies.
- (b) Cankers: lesions on a twig that are caused by the bacteria multiplying in the internal systems of the plant, leading to the collapse and death of the plant cells in that vascular system.
- (c) White exudate (a viscous fluid which oozes from lenticles, cankers and wounds on infected vines and trunks): this is caused when the bacteria, after a phase of rapid multiplication, forces its way to the surface following the path of least resistance.²³
- (d) Red exudate: compounds produced by the plant in reaction to the infection.

[93] Critically to fruit production, Psa3 causes browning and wilting of buds and flowers, collapse of fruit, and the death of plants. The progress of the disease within a plant will depend upon climatic conditions, the extent of infection, any control methods applied, and the variety of kiwifruit infected. Psa4 (also known as Pfm and Psa-LV) causes leaf spotting but the damage is limited and it does not cause widespread economic loss.

²³ This is almost exclusively bacteria and it constitutes an important source of inoculum.

The Italian outbreak

[94] Zespri's Italian production is run through a business unit called Zespri Global Supply (ZGS). The intention of ZGS is to enable Zespri to supply its northern hemisphere markets as close to 12 months of the year as possible. Both gold and green varieties are produced for ZGS. In 2008 to 2009 ZGS had around 800 hectares of orchards in Italy.

[95] In the middle of 2008 Shane Max, Zespri's global production manager, had observed some unhealthy vines in Italian orchards. There was no particular alarm at this time. The vines were removed. Psa had been reported in Italy in 1992 and it had not been especially problematic.

[96] In the Italian 2009 spring Zespri symptoms were rapidly spreading. Hayward orchards had leaf spots and Hort16A had cankers and exudate. Mr Limmer, the then general manager of ZGS, first became aware of kiwifruit vine dieback in Italy (later confirmed to be Psa and also in Italy called *Bacteriosi* and *Batteriosi*) in February 2009. The practice in 2009 continued to be to cut off the infected vine, past the visible infection. Around 11 per cent of the Italian Hort16A had to be removed that season.

[97] Spring 2009 was followed by a hot Italian summer. During the summer Mr Max observed that the cankers and exudate had stopped developing and the vines seemed to be recovering. Zespri also understood that where Psa had been a problem in other countries the growers had gotten on top of it. For example, Zespri's Asian growers had been dealing with bacterial disease, successfully, for some time. At this point Zespri was optimistic that the height of the infection Italy might have passed.

[98] However, by early 2010 Zespri was aware that orchards in Emilia Romagna were affected. By spring in early 2010 the disease was having devastating effects for some Italian growers.²⁴ Zespri concluded that Psa was not merely weather-spread and

²⁴ Some Italian growers considered that the Hort16A, which Zespri had introduced to Italy, was the cause of the devastating effects. Zespri had to front up to meetings with angry growers about this. One Italian grower family commenced a case against Zespri in the Latina Court alleging New Zealand had introduced Psa knowingly. The case did not proceed. The anger dissipated once it was understood that the problem was new and quite different from anything the industry had seen before.

that it was likely it was being borne on plant material. There were also rumours of linkages with nursery plants going from Italy and into France. By mid-2010 orchards in France were affected.

[99] Throughout this period Zespri was trying to find a solution to the Italian incursion. Around \$300,000 research funding was allocated. Zespri contacted Plant & Food Research (**Plant & Food**) and arranged for a scientist, Dr Vanneste, to visit Italy in late March 2009. He spent about a week in Latina with Mike Manning (also from Plant & Food) and Mr Max. They travelled to orchards where they observed the symptoms. The research for Zespri identified that the disease had also been present in Korea, Japan and China but had not been identified in New Zealand. Initially the research had not identified the variable susceptibility of kiwifruit varieties to Psa, nor the different virulence of the strains.

[100] However, by mid-2010 it was confirmed that the Italian Psa was a new strain. It was also around this time that Zespri became more concerned about its implications for New Zealand. Despite this concern, Mr Limmer said there was never a sense of impending disaster from him or that of his colleagues. In Italy there were challenges in addressing the problem. One of those challenges was that there was no centralised kiwifruit organisation and the post-harvest sector was fragmented and uncoordinated. This was not the case in New Zealand. Also, Italy had just had two consecutive extremely cold and wet winters which had been followed by cool, wet springs. Zespri's view was that the New Zealand environment was unlikely to be conducive to Psa.

[101] Dr Vanneste had continued to be involved in assisting Zespri on the Italian incursion. One piece of work was on the survivability of Psa on fruit. In an email to Zespri on 28 September 2010 he noted that fruit inoculated with Psa and held at 0 °C was not enough to kill the Psa. It seemed that the cold killed the other bacteria which had colonised the fruit surface but left the place free for Psa to colonise and, when conditions became favourable, to multiply. In late September to October 2010 Zespri was communicating with MAF, raising concerns about fruit imports. MAF was approached about banning imports of Italian kiwifruit into New Zealand. MAF

considered the risk was not sufficient to warrant that measure. The kiwifruit importers, however, decided they would not import the fruit.

[102] Throughout this time Zespri was informing New Zealand growers about the incursion in Italy via its “Kiwi Flyer” newsletters issued in June 2009, 29 October 2009, 30 April 2010, 25 August 2010 and 28 October 2010. These flyers reflect Zespri’s views based on their observations of the Italian experience. For example:

- (a) The 7 April 2010 Kiwi Flyer noted that Zespri had no cause for concerns for the New Zealand industry at this stage.
- (b) The 25 August 2010 Kiwi Flyer advised growers that Psa had been reported in most major kiwifruit growing countries as a result of unusually wet and cold winter/spring conditions. It advised growers that the severity of outbreaks was variable and this was most likely due to the severity of environmental conditions. It said that it was not a disease the New Zealand orchards would want. It described the symptoms.
- (c) The 28 October 2010 Kiwi Flyer advised growers that the disease should not be underestimated because of its devastating impact and that Zespri was working closely with MAF to minimise the risk of Psa reaching New Zealand.

[103] When Psa was first reported in New Zealand, Zespri was quick to have personnel on the ground and in coordinating an industry response with Government (discussed further below).

Psa outbreak in New Zealand

MAF’s initial response

[104] The initial report of Psa came around midday on Friday 5 November 2010. Dr Kerry Everett, a scientist at Plant & Food, had tested samples which had been taken from Olympos. Plant & Food contacted Robert Taylor, a senior scientist at MAF’s

Plant Health and Environment Laboratory (**PHEL**). PHEL contacted MAF's Biosecurity Group manager to say that the kiwifruit industry believed something indicative of Psa symptoms had been received and samples were being sent to PHEL. MAF's response managers were put on standby. David Yard was to be the lead Response Manager. Later that afternoon, the Biosecurity Group were told it was highly likely it was Psa and MAF put in place a response team and structure.

[105] Test results of the samples from Olympos were confirmed on 6 November 2010. MAF declared a Restricted Place at Olympos on that date on the basis that Psa was believed or suspected on reasonable grounds to be present (RP1).

[106] The MAF response team met over the weekend and were ready to go on Monday morning, 8 November 2010. Heather Pearson, Rob Taylor and a third person from MAF went to Te Puke in an investigative role. That day MAF declared a Restricted Place on Kairanga orchard on the basis that Psa was believed or suspected on reasonable grounds to be present (RP2).

[107] One of the early problems in responding to the outbreak was the available tests for Psa. At the time they could not distinguish between different Psa biovars. As it was later determined, when the tests to do this had been developed by Plant & Food in 2011, Psa4 had been quite widely present in New Zealand kiwifruit orchards for some time. This meant that the spread of Psa3 was not as wide as had been thought originally.

[108] The same problem occurred with pollen testing. As part of the MAF investigation large amounts of New Zealand commercial pollen was taken for testing. The test could not distinguish between different biovars of Psa, nor determine whether the Psa was alive or dead. Initial testing using the available test gave positive Psa results for 94 per cent of the pollen but without making these distinctions. When the test to distinguish between biovars was developed, the samples were retested and found to contain Psa4.

[109] Kiwi Pollen's imported Chilean pollen was also taken for testing. On 14 November 2010 it tested positive for Psa. This, together with the close proximity

between Kiwi Pollen's milling premises and RP1 and RP2, and that both of those orchards had recently been pollinated with Kiwi Pollen, gave rise to the early suspicion which fell upon Kiwi Pollen's product. When the test was available to distinguish between the biovars, it transpired that the Chilean pollen tested negative for Psa3.

Industry's response

[110] Mr Jager first learned about Psa in New Zealand via a telephone call at about 5 pm on Friday 5 November 2010 from Plant & Food. On Saturday morning, 6 November 2010, Barry O'Neil (MAF's then Deputy Director-General responsible for biosecurity) telephoned Mr Jager about this. They discussed the government and industry working together to respond.

[111] On Sunday 7 November 2010 at 5 pm an IAC took place. Approximately 50 people attended or telephoned into the meeting. Mr Jager describes it as a crisis management situation. The industry wanted to work with MAF but considered it could act more quickly and go further than the government. After this initial meeting, the IAC was meeting every couple of days to update the industry leaders.

[112] That day Mr Jager also sent a letter to growers telling them Psa might be in New Zealand. The letter stressed the importance of implementing best practice orchard hygiene across the industry to reduce spread, and tracing the development of the disease. Mr Jager sent a follow up letter on 10 November 2010 to growers, telling them that MAF had confirmed Psa. Zespri held grower meetings on 9 and 11 November 2010 and further meetings between 15 and 25 November 2010. Hundreds of growers attended these meetings.

[113] Mr Jager said that Zespri began with an eradication mind set. Even after MAF advised that the bacteria was everywhere and eradication was impossible, Zespri did not accept that. It thought it could be eradicated and therefore speed was overwhelmingly important. This was against the background of a concern that the Italian response had not been quick and aggressive enough. This was discussed at an IAC meeting on 14 November 2010.

Compensation

Initial phase

[114] There was significant confusion in the grower community in Te Puke immediately after Psa was confirmed to be in the region. While industry leaders and government officials moved to put together a plan, some growers were told to “sit tight and wait for [industry or government] to tell [them] what to do”. Others, such as Mr Crawshaw, had already begun cutting out affected blocks on Kairanga orchard. Mr Crawshaw said that this was self-initiated.

[115] It was decided quickly that there should be an industry response led outside of Zespri. Zespri is a marketing and sales company first and foremost and it still had a crop to sell. The proposed structure of a new body, KVH, was discussed at an IAC meeting on 16 November 2010. At that meeting IAC formally resolved to contribute \$25 million to the response.

[116] The minutes record the following resolutions:

1. To adopt the aggressive containment strategy for Psa as set out in the attached papers and presentation, recognising that such plan will continue to evolve as further information regarding Psa becomes available; and
2. To adopt the financial assistance package for growers who are required to act under the strategy as set out in the attached papers and presentation ...
3. To incorporate an incorporated society with the object of managing the implementation of the aggressive containment strategy and developing and managing a long-term National Pest Management Strategy for Psa; and
4. To work collaboratively with such body and other industry parties in an effort to manage Psa for the benefit of New Zealand Kiwifruit growers, suppliers and other stakeholders in the New Zealand Kiwifruit industry.

[117] On 17 November 2010 Mr Jager, along with other industry leaders, met with the Minister of Agriculture, David Carter, and other key ministers. The then Prime Minister, Rt Hon John Key, also joined the meeting. Co-funding for KVH, \$25 million from industry and \$25 million from the Government, was agreed. Mr Jager says that this co-funding model reflected the industry culture of self-determination. The industry thought it could apply more resources to respond than MAF could do by itself.

[118] On 18 November 2010, just over a week after incursion had been confirmed, Zespri announced the joint funded government-industry response. It attached a paper outlining a strategy for managing Psa that essentially involved cutting out affected plant material. It proposed that compensation would be paid for cut outs on a per hectare basis. On 6 December 2010 KVH formally came into existence.

Funding Agreement

[119] A funding agreement was entered into between MAF, Zespri and KVH on 18 February 2011. This formalised the terms on which agreed funding from MAF and the industry would be administered. Prior to this, Mr Yard explained that MAF did not pay any compensation to growers as a result of powers exercised during the incursion response.²⁵ He said that the growers might have been entitled to it if they suffered loss from their property being designated a restricted place.

[120] The funding was made available to growers who adopted the “aggressive management plan” and who signed a contract with KVH. It summarised the financial package as follows:

- KVH will pay a lump sum for the grower’s 2011 crop on the vine based on an independent crop estimate and the subsequent cut back of vines in accordance with the amended strategy;
- In addition, KVH will pay for regeneration costs in accordance with the original package:
 - For vines cut back to the stump: \$65k per ha for GREEN (to be spread over three years) and \$50k per ha for GOLD (to be spread over two years);
 - For vines cut back to the leader: \$25k per ha for GREEN (to be spread over one year) and \$25k per ha for GOLD (to be spread over one year);
- KVH will coordinate, manage and pay for monitoring and removal and destruction of affected plant material;
- The financial support package will apply to orchards that have already been cut out in accordance with the management strategy at the time of the cut back.

²⁵ That is, no compensation was paid under s 162A of the Biosecurity Act 1993 prior to KVH takeover of response activities.

[121] The standard form agreement entered into with growers detailed the KVH strategy and the general process that was to be followed for the orchard management plan and the financial assistance package. Once signed, KVH would organise to have the affected area cut out, including the buffer zones, in accordance with the agreed management plan. Payments would then commence and KVH would continue to monitor the orchard. Vine regeneration payments would stop if the land was converted to another use. Finally, any sale of the orchard would be effective only if the buyer agreed to grant the same rights to KVH and that all financial support remained with the original owner.

[122] The agreement set out additional terms and detailed the advantages of signing and the disadvantages of not signing. It noted that growers not signing the contract might be liable in civil suits lawsuits if the decision not to cut out leads to the spread of Psa to neighbouring orchards. The agreement had an appendix with further terms and conditions. These included:

- (a) Clause 7.2: “none of KVH, Zespri nor MAF is liable for any loss of profit, loss of revenue or other indirect, consequential or incidental loss or damage arising under or in connection with this agreement”.
- (b) Clause 9: which detailed the containment strategy and potential additional compensation. Clause 9.2 recognised that the financial assistance package may not be enough to fully compensate the grower for the cut out of their vines.

[123] All in all, KVH spent \$17.2 million in compensation payments under the financial assistance package. It spent an additional \$3.1 million on compensating nurseries for nursery stock which could not be sold. KVH also subsidised spraying for the industry to protect against Psa. The total amount spent on this was \$4.8 million.

[124] By mid-February 2011, the disease had spread outside of Te Puke and there was a lack of tools to feasibly eradicate the disease. KVH made the decision to phase out the strategy of cutting out green orchards with primary symptoms only. This decision was made public in its newsletter on 11 February 2011. On 30 March 2011,

KVH decided that there would be no further financial assistance arrangements entered into and by 27 July 2011 the financial assistance programme for cutting out orchards had ended.

National Management Plan

[125] A national pest management plan was put in place in May 2013.²⁶ This was fast-tracked after the decision was made in February 2011 to phase out the strategy of cutting out green orchards under the Funding Agreement the industry had negotiated with the Crown. The plan's primary objective was to reduce the harmful effects of Psa3 on economic well-being by preventing its spread and minimising its impact on kiwifruit production. The plan's secondary objectives included "to support the recovery of kiwifruit production ... by minimising overall production losses and enabling the successful establishment of new kiwifruit varieties".

[126] The draft plan made no provision for compensation. The reasons for this included that compensation could be extremely expensive (and would have to be paid for through a grower levy), it could create perverse incentives (such as leaving orchards to deteriorate) and it could create an avenue for some growers to exit the industry in a manner that increased the burden on the industry as a whole. The draft plan was the subject of consultation. Over 75 per cent of kiwifruit growers voted in favour of the plan with no provision for compensation.

Grower experience of compensation scheme

[127] The evidence was not clear about who of the claimants represented by Strathboss in this case received compensation and to what extent. I understand this was because Stage 2 of this case is intended to deal with loss if the plaintiffs are successful on Stage 1. However, for present purposes, I understand that some orchardists did not receive compensation payments because they had not signed contracts before the aggressive containment strategy came to an end or because by that time their orchards had not yet been diagnosed as having Psa.

²⁶ Kiwifruit Vine Health *National Psa-V Pest Management Plan* (May 2013).

[128] For example, Bob Burt, a director and shareholder of Strathboss Kiwifruit Ltd, said that he was not eligible for compensation under KVH's assistance scheme because his orchard tested positive for Psa too late in time. The first positive diagnosis for Psa on Strathboss orchard was in late October 2011. He did not have to cut out his Hort16A vines until June 2012.

[129] Murray Holmes, one of the orchardists who gave evidence in this case whose trust is a claimant, received compensation for the cut out of his Hayward vines since these tested positive for Psa very early in the incursion. However, he was not eligible for the loss of Hort16A because there was no compensation available by the time it tested positive for the bacteria. Mr Holmes also said he had felt pressured by KVH and the industry in that they spoke about how any refusal to agree to the plan would negatively affect other orchards and might lead to legal action for damages if it could be shown that neighbouring orchards were infected or re-infected by his orchard. Despite feeling that pressure, he accepted the package was voluntary and that he received detailed legal advice about entering into it.

[130] Mr Holmes received the costs of cut-out, cut-out crop and regeneration payments for cutting out four out of five hectares of his infected Hayward vines. Following this, it was announced that Hayward was probably resistant enough to Psa and that KVH would adopt phase out the cutting out of these vines. Mr Holmes refused to cut out the last hectare of Hayward vine as a result. Mr Holmes said that the true value of the compensation really depended on each grower's existing borrowing history because if the extent of pre-existing debt loading was low then the financial strain would be eased more by the compensation than in the situation where the grower had borrowed a lot.

[131] Donald Hyland, another orchardist, also received KVH compensation as his orchard was positively diagnosed with Psa early in the incursion. He was paid a lump sum for the cost of cut out crop, cost of cut out and regeneration costs. One of the key issues for Mr Hyland during the early period of incursion was there was significant uncertainty about whether his orchards were infected. He received contradicting diagnostic correspondence from MAF within days of each other but his orchard was confirmed as having Psa in February 2011.

[132] Robert Bayly, another orchardist who gave evidence, did not receive any compensation as he refused to cut out his vines. He was very concerned that KVH's strategy to pull out all vines with primary symptoms was not supported by scientific evidence. Mr Bayly spoke to the time pressure that was felt by growers in the early months of the incursion because KVH would highlight the fact that compensation funds under the management strategy was capped. He also spoke to feeling ostracised by the industry and the grower community for his decision not to cut out.

[133] Further financial assistance was made available in June 2012 when biosecurity incursions were able to be classified as an adverse event for the purpose of Ministry of Social Development assistance. The Psa incursion was classified as a medium-scale adverse event in December 2012. This enabled orchardists to apply for receive Rural Assistance Payments or RAPs from the Ministry of Social Development. These covered the essential living costs of growers whose income had been affected by the incursion. It was an income-tested social welfare payment intended to ensure that affected growers could put food on the table without selling their orchards, assets or otherwise compromise their profitability in the future. The RAPs scheme for Psa did not have retrospective effect. It was to cover needs going forward. Three orchardists applied for RAPs during the medium-scale classification. There were also some forms of tax relief from Inland Revenue as a result of the classification.

Impact of Psa

At an individual level

[134] The Psa outbreak was an incredibly stressful time for all those caught up in it.

[135] There was, for example, stress about what to do with vines. As mentioned, Mr Bayley, a third generation kiwifruit grower, described being ostracised by other growers because he refused to cut out his vines. Murray Holmes also described the difficult decisions he had to make about whether or not to follow advice to cut out vines.

[136] There was evidence from various participants in the kiwifruit industry about the impact the incursion had on the emotional and mental well-being of those in the

industry. One grower spoke to the feeling of depression that he and others like him suffered as a result of the incursion. He said:

- Q. ... You're welcome to, if you'd like – and you're not under any pressure if it's uncomfortable – just to talk about the impact it had on you of seeing that work that you're so proud of affected in that way.
- A. Oh devastated. ... I suffered badly, and still do. I don't read anything about kiwifruit. It just upsets me. I occasionally talk to people about it, but I'm a very ambitious man. I've turned my ambition to fishing to try to forget about this. I strive very highly in fishing as well, just as I have in dairy farming and orcharding, and all I can say is that it destroyed me. My legs are possibly even hurried up because of Psa. In a roundabout way, I was under such stress it didn't do my diabetes any good at all and in the last two years I've lost two legs because of it. Well, not because of Psa but because of stress.

[137] The emotional repercussions were also felt by those within the wider industry and Te Puke community as well. For example, Lee Crawshaw, a beekeeper operating in Te Puke, said:

- Q. Mr Crawshaw, you also gave some evidence before about the restrictions that MAF placed on beehives after the incursion. You're obviously a member of the industry, were you part of the concern I understand beekeepers had that if the restrictive place notices were put on the hives they might get stuck on the orchards?
- A. I was definitely concerned and to the degree while my hives were in Graeme's orchard and knowing – 'cos the whole thing was this horrible moving mass of nobody knowing anything. It was terrible. And it was horrible for us, we were in and out of everybody's orchards and they're looking at us, "You guys are bringing it to us," and it was like, "Are we?" What are we bringing if we're just trying to do our jobs."

[138] Murray Judd, who worked at Seeka at the time of disease outbreak said:

... our lives were in chaos really and remarkably stressful and so any ineptitude I have at remembering months is magnified I'm sure. You know, it's hard to convey to the Court I think how stressful that time was. I was just thinking sitting there this morning. Imagine if you had a 15 month old who was diagnosed with cancer and you don't know if that child is going to live or not live. It was a bit like that in Te Puke. No one knew if they had a livelihood in six months or 12 months, or not at all and so we were all doing things that we had never done before. So I don't know if that's amelioration or excuse, but it does mean that things like when exactly things happened, sometimes I think and read what I've written and think, oh, is that right but this is my best recollection.

[139] Michael Franks, the then and current Chief Executive Officer of Seeka, said that it was a very stressful time for those affected by the disease outbreak and Seeka was required to work long hours and ensure that those directly affected were checked up on and looked after. Mr Franks described the outreach that Seeka was receiving from growers and what it was doing to help them psychosocially:

Seeka was regularly being contacted by kiwifruit growers who no longer had any income, who were seriously in debt, and who had negative equity in their properties. We spent considerable time talking to growers whose situation was precarious. It was also a difficult time for Seeka's staff members. We have close relationships with our growers. These relationships are not just professional relationship: our growers and their families are also our friends. It is a close knit community.

...

I spent a lot of time talking to growers as they worked through their personal situations, including facilitating the buying and selling of orchards to assist with individual debt situations.

We also did what we could to help growers emotionally. Ian Greaves, who was a member of the Seeka Grower Council, was instrumental in making sure growers got the support they needed. He was part of a network that had been established under KVH and KGI to support growers emotionally. Ian provided emotional support and suicide prevention. Seeka was one of the organisations who financially supported him. From time to time, I would refer people to Ian when I was concerned for their welfare. This was typically late at night.

[140] He expanded on this in oral evidence as well:

... I'm reasonably well known amongst our growers in the industry and people know how to contact me so typically they would ring me. During the day, we're normally pretty busy. We would take calls and my PA would give me a list of people I had to ring at the end of the day and so I'd ring them either on my way home or when I got home, or later on and I would talk to them, and generally I think most of them just wanted somebody to talk to and given the other things we were doing, we could tell them the sort of things that we were doing without giving them false hope, but to give them some hope that something was happening, yeah. Some cases if they were in a really desperate situation, I might ask them to come and have a chat and might put their numbers up on the whiteboard, but if I was really worried about I'd ring ... and say, "Hey mate, you need to ring this guy."

[141] From early on, suspicion fell on Kiwi Pollen. Graeme Crawshaw described what this was like for them personally. He and Ms Hamlyn had previously had good relationships with their neighbours. After the incursion their relationship changed quite dramatically. Some growers stopped speaking to them and some made threats, indirectly, against Mr Crawshaw. MAF posted security guards outside their gates

because they were worried about their safety. People blamed them. At least once a week Mr Crawshaw would be asked, by his friends or other growers and acquaintances, if he was okay because they had heard he had been assaulted. His cousin, Lee Crawshaw, telephoned him once and said “I’m so pleased to hear your voice. I’d heard you’d done away with yourself”. That had not crossed Graeme Crawshaw’s mind, but someone had told Lee this. As Graeme put it in his evidence at the hearing: “It was a torn up community and a torn up industry and I completely understand everything that everyone said. I may well have done the same”.²⁷

[142] Apart from the emotional stress, the evidence indicates the compensation package arranged between industry and government left some growers facing losses and financial hardship. Because of the harvest period (March through June), the impact of Psa on the crop was limited in 2010/11. It seems that it may also have been quite limited in 2011/12, as this was a record year for production, but some gold growers were affected. The production of gold trays was down in 2012/13 but the Gold OGR was up because of the reduced supply. However production of Gold trays was dramatically down by 2013/14 when the newly grafted Hort16A were not yet producing.²⁸ Production of gold trays in 2014/15 was still well down from 2011/12 but was improving. The 2015/16 season was the most profitable for kiwifruit growers in the industry’s history.

At an industry level

[143] There were different consequences for different people. Mr Jager explained this in the following exchange:

Q. So you’ve talked later about that impact and in particular you’ve recorded the email or the press release from the Zespri chairman at paragraph 152 of your brief and his statement there was, “Psa caused immense damage to businesses and people, including myself. At its height it devastated peoples’ incomes, their assets, their savings, their life work and their self esteem. It put immense pressure on people and families on orchards and in the wider community”

²⁷ A complaint was made that the Kiwi Pollen mill was in breach of the Biosecurity Act and another complaint was made to the Commerce Commission. Mr Crawshaw was unaware of or did not remember those complaints.

²⁸ For example, Strathboss’ orchard did not have a good crop for two years.

- A. ... Yes I think two things are true. So on the one hand, it can be true that by and large the industry has recovered, cash flows have recovered, asset values have recovered and so it can be true that the industry is better off today than it was before the impact of Psa and certainly through the impact of Psa. At the same time it can be true that depending on their financial situation going into Psa, depending on the location of their orchards, depending on how they reacted to the impact of Psa, as you say whether they sold their orchards when they were distressed, then some growers, some individual growers will be worse off, so both of those things can be true at once.
- Q. Yes and in terms of the position of individual growers, and growers who had to get out, either voluntarily or because their bank forced them out, the numbers only really tell part of the story don't they?
- A. Yes.
- Q. And the emotional and mental stress that came along with a disease like Psa, can't be underestimated, do you agree with that?
- A. Correct, yes.
- Q. So whilst one might look at the numbers in Zespri's annual financial statements for 2016/2017 and say well those look healthy, the reality is for people who were looking at the numbers on the ground, their decisions about how they were going to respond to Psa, humanly and naturally were massively affected by the levels of stress that they were subject to?
- A. Correct. For completeness the vast majority of growers got through Psa and are well on the way to recovery accepting that there is a cash flow impact that takes years to catch up from. A relatively smaller number of growers fell out of the industry as you describe. That doesn't detract from the very significant and negative impact on those people that did fall out of the industry.

[144] Mr Jager described Psa as “hugely traumatic” for the industry. Growers’ equity disappeared overnight. It was “very tough” in 2012 in particular. As to the industry recovery he said:

However, now, in 2017 the industry is in the best shape it's ever been in. It's bigger and more profitable. G3 is a better variety than Hort16A – it grows higher yields, it's a bigger sized fruit, it's got a broader taste appeal and it is selling better in the market. The productivity of green kiwifruit has also markedly increased. If it wasn't for Psa, we would still have a lot of Hort16A in the ground, facing the end of the plant variety right in New Zealand and the challenges that would have caused. This productivity means that land values and returns are higher than they've ever been.

So looking at the big picture, and despite the hardship and emotional trauma caused at the time, it is hard to make the case that we are worse off now than we would have been if Psa hadn't come.

[145] On a similar theme, Barry O’Neil, Chief Executive of KVH, said:

... production of both green and gold varieties on orchards has significantly increased since Psa arrived. My only explanation for that is that now growers are paying attention to the detail of growing kiwifruit, so their orchard set-up is better, they’ve drained the orchard if it’s a wet area ... so they’re looking after the vine health better ... so I believe the attention to the details of growing kiwifruit as a result of Psa has actually resulted in production levels that have increased since Psa arrived.

[146] As described by Mr Jager, a large part of the recovery has been the rollout of the G3 variety. Mr Limmer described the market’s response to G3 as “phenomenal” and the overall market uptake as “exceptional”. The volume of gold fruit has nearly doubled. G3 has been attractive to new consumers and new markets have rapidly developed. It has achieved significant market premiums at much higher volumes. It has extended storage characteristics. It is a cost effective and environmentally friendly product to grow and pack. It has driven grower returns and orchard values to record levels.

[147] As earlier mentioned, the G3 variety was one of the varieties in development when Psa3 struck New Zealand. In early 2012 Zespri released the “GOFO” scheme, which enabled gold kiwifruit growers to swap their existing Hort16A licence for a G3 licence. G3 licences were also released to green kiwifruit growers under a commercial bid process. Over 2012-2013, 1,854 hectares of kiwifruit were grafted with G3. As evidence of the industry recovery:

- (a) G3 licences were originally provided for \$8,000 per hectare. They have a market value of \$270,000 per hectare in 2017.
- (b) Before the Psa incursion, green kiwifruit orchards were selling on average for \$250,000 per hectare. In March 2017 they were selling for \$360,000 to \$400,000 per hectare. Before the Psa incursion, gold orchards were selling for approximately \$400,000 per hectare. In March 2017 they were selling for \$700,000 to \$770,000 per hectare.

- (c) In October 2010, before the Psa incursion, Zespri's plan was to triple export revenue from \$1 billion to \$3 billion by 2015. Zespri is now planning on export revenue of \$4.5 billion by 2025.

Biosecurity in New Zealand

Importance to New Zealand

[148] Border protection is important to any nation. It is particularly important to New Zealand.²⁹ Fraser Colegrave, an economist called by the plaintiffs, summarised the reasons for this as follows:

- (a) New Zealand is highly trade dependent. This has the twofold effect of high import volumes elevating the probability of an incursion and our high exports magnifying the likely consequences.
- (b) New Zealand is highly reliant on primary production which is at constant and growing risk from incursion. In 2015, for example, 73 per cent of our merchandise exports were either food or raw materials (such as wood), compared with 10 per cent for the OECD average.
- (c) Primary production is densely concentrated, in a handful of very successful sectors, which significantly exacerbates incursion risk. For example, sheep and cows account for nearly all our animal farming, while three grains (wheat, barley and maize) comprise 95 per cent of our total grain production. Our top three horticultural exports (wine, kiwifruit and apples) accounted for nearly 75 per cent of horticultural exports in 2015.
- (d) New Zealand is also strongly dependent on tourism. This is partly underwritten by our clean, green image.

²⁹ For example, Ministry for Primary Industries *Tiaki Aotearoa – Protect New Zealand – The Biosecurity Strategy for New Zealand* (August 2003) at page 5 states: “New Zealand is more dependent on biosecurity than any other developed country”; Office of the Controller and Auditor-General *Performance audit report: Ministry for Primary Industries: Preparing for and responding to biosecurity incursions* (February 2013) at 5 states: “Biosecurity is fundamental to New Zealand’s economic health and natural heritage”.

[149] Border protection is critical to the kiwifruit industry. The industry faces a range of pest and pathogenic threats. It is a large industry with high export receipts. Production is highly concentrated over a small area which facilitates the rapid spread of pests and pathogens from one orchard to another.

[150] Mr Colegrave referred to a number of reports which estimate the economic impacts of incursions on primary industries. Most of these concern the direct economic impacts. For example clover root weevil could reduce annual profits by between \$170 million and \$600 million and giant buttercup could reduce annual profits by \$310-\$990 million. A 2003 Reserve Bank and Treasury Report took a broader view and used macroeconomic models to estimate the broader economic effects of Foot and Mouth Disease. This predicted a range of catastrophic effects including a cumulative loss of around \$10 billion in GDP over 2 years.

[151] There is also the potential for incursions to cause permanent losses of biodiversity. Around 90 per cent of New Zealand species are found nowhere else in the world. This increases the risk of biosecurity losses from an incursion because native flora and fauna may be less resilient to invasive alien species.

[152] Therefore, as Mr Colegrave puts it, the stakes are high, with incursion threats only likely to rise with increasing globalisation, tourism, new trade markets, and climate change which may change the profile of pest and pathogenic threats. As farming systems move to their technical limits there is also the prospect that, what were once thought to be minor pest species, could now cause disproportionate damage.

[153] Economic analysis by Mr Colegrave concludes that border protection is better than post-border mitigation. In short, biosecurity is critical to the kiwifruit industry, as it is for other primary industries. Biosecurity is in the national interest and the ongoing role of Government is critical to border protection.

The SPS Agreement

[154] New Zealand is a party to the Agreement on the Application of Sanitary and Phytosanitary Measures (**SPS Agreement**), which forms part of the wider World Trade

Organisation international trade enhancing arrangements.³⁰ The SPS Agreement provides international obligations which New Zealand has agreed to meet. Under the SPS Agreement:

- (a) Governments retain the right to determine their appropriate level of risk to human, animal and plant life and health; but
- (b) must be able to demonstrate that the least trade-restrictive measure³¹ to achieve a government's appropriate level of protection (**ALOP**) is chosen; and
- (c) must be able to justify any restrictive "measure" on the basis of science.³²

[155] The purpose of these requirements is to stop restrictive measures being imposed on imports as protective barriers to trade. These principles also underpin aspects of New Zealand's bilateral trade agreements (for example New Zealand's trade agreement with China). New Zealand is dependent on trade for its prosperity and has long been an advocate for trade liberalisation and a rules-based, multilateral WTO system.

[156] New Zealand is concerned to ensure import decisions are technically justified and supported by sufficient scientific evidence. This is also important to ensure that New Zealand's measures are not challenged by other member-states at the WTO. New Zealand has utilised the international framework to hold others to account as, for example, when New Zealand was in dispute with Australia about the Australian risk assessment for New Zealand apples.

³⁰ The World Trade Organisation (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) 1867 UNTS 493 (opened for signature 15 April 1994, entered into force 1 January 1995); also the International Plant Protection Convention (IPPC) 2367 UNTS 223 (opened for signature 17 November 1997, entered into force 2 October 2005).

³¹ "SPS Measure" is defined broadly under Annex A of the SPS Agreement and includes "any measure applied" – "(a) to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms".

³² SPS Agreement, art. 2.2.

[157] The Biosecurity Act was drafted when the SPS Agreement was being negotiated. Barry O’Neil, who was a New Zealand delegate to the WTO and later became head of Biosecurity New Zealand, describes the Act as reflecting a shift in Government public policy from a more conservative approach to a “robust risk analysis system based on science”. He described that shift as necessary if New Zealand’s exporters expected to receive such treatment in return and realise the government’s objective to liberalise trade internationally.

[158] One of the issues traversed at the hearing was the nature of the scientific evidence that could be relied upon by a country when deciding on whether to impose measures. A theme of some of the defendant’s evidence was that peer reviewed published scientific evidence was required. However that was clarified through the evidence of a number of witnesses. For example, Gretchen Stanton, a witness called by the defendant because of her expertise arising from her over 30 years working for the WTO Secretariat and its precursor, gave this evidence:

Q. So it’s fair to say from this and from the other decisions – I won’t take you to all of them – that a relevant factor is that notwithstanding the fact that there may be gaps in published literature if scientists can make some rational assessments about the risk then they ought to do so. Is that a fair summary of that?

A. Yes. Again, with a lot of qualifiers to ensure that they’re looking at, you know, scientists who are familiar with the subject, the product, the risks at hand, yes.

Q. So credible, in other words?

A. Yes, yes.

Q. And just going to 186, it seems to me just based on the last part of the first sentence that another relevant factor for a risk assessment can be practical experience as well as scientific studies. You’d agree with that?

A. Yes. That's correct. It is an element to be considered.

[159] The fact that it was appropriate and necessary to consider all credible scientific information, rather than just information published in peer reviewed journals, was endorsed by the other witnesses of fact including Mr O’Neil and Dr Newfield. Dr Butcher explained it this way:

THE COURT:

Q. I don't think you answered it a few questions ago. What sort of scientific evidence can be taken into account in determining that there's credible scientific evidence in particular? Does that there need to be peer-reviewed published literature that you're relying on?

A. That certainly is the gold standard, Your Honour, but not exclusively so. As an example, when we've – there's a number of different aspects that we consider. When we were aware of the incursion of xylella in olives in Italy, for example, we looked at the movement controls between Italy and other parts of Europe. It has now been found in other parts of Europe as well. We were concerned that the controls of the movement of the plant material around Europe wasn't sufficiently controlled, that there wasn't a risk that the pest moving into other parts of Europe.

...

But equally when we are considering a new identification of a species as now being a host to xylella which wasn't previously known to be a host, that's new information that suggests that our previous understanding of what the host range was, was limited. As I've mentioned in my brief, that's because perhaps these hosts haven't been exposed to this bacterium up to that point. So we've indicated because there are related plants to that species, our initial response is to say, "Okay, we're going to apply measures on the genus," if that's the case and in fact if there are more than one genera affected by xylella we will take it up to the next level of, you know, to a family or something like that and ban the whole family as well, or apply measures to the whole family. So we're trying to work off known information. Here's a new host and it's a species within a genus. We don't know whether the rest of the members of that genus could also be hosts, so we're taking action on those as well.

[160] Dr Françoise Petter, the Director at the European Plant Protection Organisation (EPPO), called by the defendant, agreed that it was permissible under the SPS Agreement to make comparisons of pathogens between species:

Q. I just wanted to ask you or get you to confirm that for the PRA and other PRAs, I read those two comments as indicating that comparisons can be made between pathogens and between species if the experts are comfortable that those comparisons are appropriate, is that right?

A. That's correct. It is also allowed in ISPM 11 so when you do that, you have to justify why you're thinking that the scientific evidence for a specific species is also valid for another species.

Q. Yes I understand.

A. So this is the point you would discuss in an expert working group.

Q. I understand.

[161] There is provision in the SPS Agreement to impose provisional measures where the scientific evidence is not at that point sufficient, although there does still have to be some basis for doing so and clarification of the points in issue must be pursued within a reasonable time.

[162] Issuing or amending an Import Health Standard (**IHS**) (discussed further below), or refusing import permits for a class of commodities is a “measure” under the SPS Agreement.

Biosecurity Act

[163] The Biosecurity Act 1993 is the statute under which MAF:

- (a) granted permits for Kiwi Pollen to import pollen;
- (b) cleared the consignments of pollen at the border; and
- (c) responded to the Psa incursion.

[164] The long title of the Act is as follows:

An Act to restate and reform the law relating to the exclusion, eradication, and effective management of pests and unwanted organisms.

[165] At the applicable time period, the Act was divided into 10 parts. Part 1 contains the preliminary provisions, including the definitions of various terms used in the Act. Part 2 contains the functions, powers and duties of the responsible Minister and local and territorial authorities. The Minister, for example, has non-delegable powers in relation to biosecurity emergencies.³³

[166] Part 3 is of particular importance for present purposes. Its purpose is “to provide for the effective management of risks associated with the importation of risk goods”.³⁴ Risk goods are defined as follows:³⁵

³³ Biosecurity Act 1993, s 11.

³⁴ Section 16.

³⁵ Section 2, definition of “risk goods”.

risk goods means any organism, organic material, or other thing, or substance, that (by reason of its nature, origin, or other relevant factors) it is reasonable to suspect constitutes, harbours, or contains an organism that may—

- (a) cause unwanted harm to natural and physical resources or human health in New Zealand; or
- (b) interfere with the diagnosis, management, or treatment, in New Zealand, of pests or unwanted organisms.

[167] An organism, organic material, natural and physical resources and unwanted organisms are in turn defined. The definition of organism excludes a human being or a genetic structure derived from a human being (which are dealt with differently). The definitions are wide.

[168] Part 3 sets out the process for importing risk goods. It is divided into the following subparts:

- (a) Arrival of craft: ss 17-19;
- (b) Import health standards: ss 20-24;
- (c) Clearance of goods: ss 25-29;
- (d) Inspections, declarations, etc: ss 30-41.

[169] Sections 17-19 require notice to be given of the arrival of craft (aircraft, ship, boat and other vessels) and require a person in charge of a craft to obey reasonable directions given by an inspector concerning the movement of the craft, the unloading or discharge of risk goods or the disembarkation of crew or passengers from the craft and measures to ensure that any risk goods not intended to be unloaded or discharged from the craft are maintained in a secure place, provide a report to answer questions, and every person disembarking from the craft is required, on request, to make his or her baggage available for inspection by an inspector.

[170] Section 22 provides for the issue of IHSs. It provides:

22 Import health standards

- (1) The Director-General may, following the recommendation of a chief technical officer, issue an import health standard specifying the requirements to be met for the effective management of risks associated with the importation of risk goods before those goods may be imported, moved from a biosecurity control area or a transitional facility, or given a biosecurity clearance; and may, in a like manner, amend or revoke any import health standard so issued.
- (1A) An import health standard issued under this section applies to goods the importation of which involves, or might involve, an incidentally imported new organism.
- (2) If an import health standard requires a permit to be obtained from the Director-General before the goods can be imported, moved from a biosecurity control area or a transitional facility, or given a biosecurity clearance, the Director-General may, if he or she thinks fit, issue the permit.
- (3) Nothing in this Act obliges the Director-General to have an import health standard in force for goods of any kind or description if, in the Director-General's opinion, the requirements that could be imposed on the importation of those goods would not be sufficient to enable the purpose of this Part to be met if the importation of those goods were permitted.
- (4) An import health standard issued under this section may apply to goods of a certain kind or description imported from—
 - (a) a country or countries specified in the import health standard; or
 - (b) countries of a kind or description specified in the import health standard; or
 - (c) all countries; or
 - (d) a location or locations specified in the import health standard.
- (5) When making a recommendation to the Director-General in accordance with this section, the chief technical officer must have regard to the following matters:
 - (a) the likelihood that goods of the kind or description to be specified in the import health standard may bring organisms into New Zealand:
 - (b) the nature and possible effect on people, the New Zealand environment, and the New Zealand economy of any organisms that goods of the kind or description specified in the import health standard may bring into New Zealand:
 - (c) New Zealand's international obligations:
 - (d) such other matters as the chief technical officer considers relevant to the purpose of this Part.

- (6) Before making a recommendation to the Director-General on the issue or amendment of an import health standard, the chief technical officer must, unless the standard needs to be issued or amended urgently, or unless the chief technical officer considers that the amendment is minor, consult with those persons considered by the chief technical officer to be representative of the classes of persons having an interest in the standard.
- (7) The consultation may be on the import health standard or on a document that analyses or assesses the risks associated with the goods or class of goods to which the goods belong.
- (8) Before making a recommendation to the Director-General in accordance with this section the chief technical officer must give notice of the intention to make the recommendation to the chief executive of every department of State whose responsibilities for natural resources or human health may be adversely affected by the issue, amendment, or revocation of the relevant standard.
- (9) The Director-General must maintain a register of the import health standards (as amended from time to time) issued under this section.
- (10) The register must be available for public information and inspection at the office of the Director-General during normal office hours.

[171] All goods must receive biosecurity clearance before entering New Zealand.³⁶ Uncleared goods must proceed to a transitional facility or a biosecurity control area.³⁷ Clearance is granted by an “inspector” appointed by the Chief Technical Officer.³⁸ To grant clearance, the inspector must be satisfied either that:

- (a) the goods are not risk goods; or
- (b) the (risk) goods meet the requirements of s 27(a)-(e) which are as follows:
 - (a) that the goods comply with the requirements specified in an import health standard in force for the goods (or goods of the kind or description to which the goods belong); and
 - (b) that there are no discrepancies in the documentation accompanying the goods (or between that documentation and those goods) that suggest that it may be unwise to rely on that documentation; and

³⁶ Section 25.

³⁷ Section 39.

³⁸ Sections 26 and 103.

- (c) in the case of an organism, that the goods display no symptoms that may be a consequence of harbouring unwanted organisms; and
- (d) that the goods display no signs of harbouring organisms that may be unwanted organisms; and
- (e) there has been no recent change in circumstances, or in the state of knowledge, that makes it unwise to issue a clearance.

[172] Sections 30-33 give an inspector powers concerning the making of declarations about goods, surrendering goods, processing of unaccompanied goods, boarding craft and giving directions to the person in charge of a craft. Section 34 requires persons disembarking a craft to obey reasonable directions given by an inspector. Section 35 requires a person in a biosecurity control area to obey any reasonable direction of an inspector, answer an inspector's question and make goods available for examination.

[173] Section 39 permits the Director-General to approve standards for building, maintaining, or operating transitional facilities. A transitional facility is for the purpose of inspection, storage, treatment, quarantine, holding, or destruction of uncleared goods.³⁹ The Director-General may approve a person to be the operator of the transitional facility.⁴⁰ The Director-General may designate any place to be a quarantine area.⁴¹ Quarantine is defined as meaning the confinement of organisms or organic material that may be harbouring pests or unwanted organisms.⁴²

[174] Part 4 is concerned with surveillance and prevention. Amongst other things it provides that an inspector or authorised person may require a person to provide information concerning pests, pest agents, unwanted organisms or risk goods.⁴³ Every person is under a duty to inform the Ministry of the presence of what appears to be an organism not normally seen or otherwise detected in New Zealand.⁴⁴

³⁹ Section 2.

⁴⁰ Section 40.

⁴¹ Section 41.

⁴² Section 2, definition of "quarantine".

⁴³ Section 43.

⁴⁴ Section 44.

[175] Part 5 is concerned with pest management. Its purpose is “to provide the effective management or eradication of pests and unwanted organisms”.⁴⁵ Section 55 requires that the management or eradication of pests must be in accordance with pest management strategies. A national pest management strategy specifies a number of matters including:⁴⁶

- (a) the pest or pests to be managed or eradicated;
- (b) the objectives of the strategy;
- (c) the management agency that is responsible for implementing the strategy;
- (d) the period for which the strategy will remain in force;
- (e) the basis, if any, on which compensation is to be paid by the management agency in respect of losses incurred as a direct result of the strategy; and
- (f) the sources of funding for the implementation of the strategy.

[176] A national pest management strategy is notified by the Minister. The Minister must be of the opinion that the benefits of having a pest management strategy outweighs its costs (amongst other things).

[177] There is also provision for a regional pest management strategy. The contents of a regional pest management strategy are also specified. They include “the basis, if any, on which compensation is to be paid by the management agency in respect of losses incurred as a direct result of the implementation of the strategy”.⁴⁷

⁴⁵ Section 54.

⁴⁶ Section 69A.

⁴⁷ Sections 76 and 80A.

[178] Section 86 provides that a pest management strategy shall not provide for or permit the payment of compensation in certain circumstances. This includes.⁴⁸

In respect of loss suffered before the time when an inspector or authorised person establishes the presence of the pest on the premises of the person.

[179] Section 90 provides for the imposition of a levy payable to a pest management agency for the purposes of wholly or partially funding the implementation of a pest management strategy by Order in Council.

[180] Part 6 contains administrative provisions. It includes:

- (a) The appointment of chief technical officers,⁴⁹ deputy chief technical officers,⁵⁰ inspectors, authorised persons, and accredited persons.⁵¹
- (b) The powers of inspectors and authorised persons. These include:
 - (i) The power to seize and dispose of unauthorised goods.⁵² All costs and expenses attendant upon the custody and disposal of seized goods are borne by the owner or any other person in possession of the goods immediately before they were seized subject to a waiver discretion vested in the Director-General.⁵³
 - (ii) The power to make a restricted place declaration.⁵⁴ The power is vested in an inspector or authorised person. A declaration may be made if he or she “believes or suspects on reasonable grounds that a pest or unwanted organism is or has been in a place”.⁵⁵ Notice is given to the occupier of each place included in the area of the restricted place.⁵⁶ While a notice is in force, no person shall, without the permission of an inspector or

⁴⁸ Section 86(1)(c).

⁴⁹ Section 101.

⁵⁰ Section 102.

⁵¹ Section 103.

⁵² Section 116.

⁵³ Section 117.

⁵⁴ Section 130.

⁵⁵ Section 130(1).

⁵⁶ Section 130(3).

authorised person, remove any organism, organic material, or risk goods, or any other goods that may have been in contact with any organism, organic material or risk goods from the area, or introduce any goods of any kind to the place.⁵⁷

(c) The powers of a chief technical officer to declare an area as a controlled area⁵⁸ and to apply to a District Court Judge for a warrant to authorise a road block, cordon or check point.⁵⁹

(d) Provisions for the recovery of costs.

(i) The Director-General, every other Chief Executive, and every management agency is required to:⁶⁰

Take all reasonable steps to ensure that so much of the costs of administering this act, including costs incurred as the management agency of a pest management strategy, as are not provided for by money appropriated by Parliament for the purpose, are recovered in accordance with the principles of equity and efficiency ...

(ii) The Governor-General, on the recommendation of the responsible Minister, may by Order in Council impose a levy “for the purposes of wholly or partially funding a service provided or function performed by the department for the purposes of the Act.”⁶¹

[181] Part 7 relates to exigency actions. It enables the Minister to declare a biosecurity emergency and exercise emergency powers.

[182] Part 8 is concerned with enforcement, offences and penalties.

⁵⁷ Section 130(4).

⁵⁸ Section 131.

⁵⁹ Section 132.

⁶⁰ Section 135(1).

⁶¹ Section 137.

[183] Part 9 contains the miscellaneous provisions. It includes a compensation provision as follows:

162A Compensation

- (1) Where—
 - (a) powers under this Act are exercised for the purpose of the management or eradication of any organism; and
 - (b) the exercise of those powers causes verifiable loss as a result of—
 - (i) the damage to or destruction of a person's property; or
 - (ii) restrictions, imposed in accordance with Part 6 or Part 7, on the movement or disposal of a person's goods,—

that person is entitled to compensation for that loss.
- (2) The compensation payable under this section must be of such an amount that the person to whom it is paid will be in no better or worse position than any person whose property or goods are not directly affected by the exercise of the powers.
- (3) Compensation payable by a Minister or by a chief executive is payable from money appropriated by Parliament for the purpose.
- (4) Compensation must not be paid under this section to any person—
 - (a) in respect of a loss in relation to unauthorised goods or uncleared goods; or
 - (b) in respect of a loss suffered before the time when the exercise of the powers commenced; or
 - (c) who has failed to comply with this Act or regulations made under this Act and whose failure has been serious or significant or has contributed to the presence of the organism or to the spread of the organism being managed or eradicated.
- (5) Any dispute concerning the eligibility for, or amount of, compensation must be submitted to arbitration and the provisions of the Arbitration Act 1996 apply.
- (6) Nothing in this section applies to any loss suffered by any person as a result of the exercise of powers under this Act to implement a pest management strategy.

[184] It provides an immunity for inspectors and others as follows:

163 Protection of inspectors and others

An inspector, authorised person, accredited person, or other person who does any act or omits to do any act in pursuance of any of the functions, powers, or duties conferred on that person by or under this Act or a pest management strategy shall not be under any civil or criminal liability in respect of that act or omission, unless the person has acted, or omitted to act, in bad faith or without reasonable cause.

[185] It protects Crown from civil liability when it has goods in its custody as follows:

164 Liability for goods

The Crown shall not be under any civil liability in respect of any loss or damage to any goods suffered—

- (a) while those goods are in the custody of the Crown by reason of the exercise, in good faith and with reasonable care, of authority under this Act; or
- (b) as a result of or in the course of any treatment, handling, or quarantine of those goods undertaken or required in good faith and with reasonable care by an inspector or any other person acting in the exercise of authority under this Act.

[186] Part 10 contains transitional provisions and is not relevant to this proceeding.

Funding for biosecurity

[187] MAF's responsibilities for biosecurity are funded by appropriations. The allocation and prioritisation of resources under this framework are subject to Parliamentary oversight. The Public Finance Act 1989 requires the Crown to seek Parliamentary authority for expenses incurred and money spent. The authority and appropriations are linked in the Public Finance Act to the review by Parliament of the particular department's intentions for the funds, and the performance of the Department in obtaining the outcomes desired by the Government.

[188] MAF's Statement of Intent was presented to the House in May 2009. This sets out the Government's goals, priorities and the measures and indicators that would be used to assess MAF's performance. This was supported by a statement of responsibility from the Minister and a confirmation from the Director-General that the information was consistent with the proposed appropriations set out in the estimates for 2009/10.

[189] The Estimates of Appropriations for 2009/10 were also presented to the House in May 2009. For Vote Biosecurity the appropriation was \$185.6 million.⁶² This included standards of performance agreed with the Minister for MAF's various activities. The estimate for Vote Biosecurity was reviewed by the Primary Industries Committee. The Minister gave evidence before the Committee. The estimates were given approval in the Appropriation Act enacted in September 2009.

[190] At the end of the 2009/10 Government financial year, MAF presented its Annual Report to the House. This report included a review of the outcomes agreed with the Government, audited financial statements and its service performance including in relation to specific targets and priorities agreed with the Minister. The Annual Report was reviewed by the Primary Production Committee in November and December 2010.

[191] Additional funding for biosecurity incursion responses may come out of the Government's contingency fund and is approved under the supplementary estimates process.

[192] Biosecurity is also partly funded by levies and charges.⁶³ As described by Murray Sherwin, the then Director-General of MAF, the statutory regime requires MAF to take reasonable steps to ensure the costs of administering the Act are recovered through service charges and levies to the extent that resourcing is not provided for that purpose. For example, MAF is empowered to impose a levy for services and charge fees for inspection of consignments at the border. They are also empowered to charge a passenger levy for carrying out their functions in the passenger pathway. This funding model allows MAF to spread the costs of carrying out its biosecurity functions across an entire sector or segments of beneficiaries. Treasury and the Auditor-General provide guidelines regarding these levies and charges.

⁶² The total appropriation for all Votes was \$74.2 billion.

⁶³ Biosecurity Act, ss 135-142. Charges and levies are subject to Ministerial approval and guidelines laid out by Treasury and the Office of the Auditor-General. Levying requires consultation and goes through an Order in Council process. It can lead to judicial review. It is also a political decision.

[193] Charges were imposed on importers for border clearance services. The evidence was that in the 2009/10 year these nearly covered the total cost of cargo clearance (\$258,849,000 in costs and \$25,427,000 in revenues from levies and fees). The fees and levies subsequently have increased substantially.

[194] Kiwi Pollen paid a fee for its pollen permit application. Kiwi Pollen was also advised that self-funding of a risk analysis was potentially available where Crown funding was unavailable.

MAF

[195] Biosecurity New Zealand was the business group within MAF which was the lead agency for New Zealand's biosecurity system at the relevant time. Within Biosecurity New Zealand there were four directorates: Policy & Business Directorate; Biosecurity Strategy Unit; Pre-Clearance Directorate; and Post-Clearance Directorate.

[196] Biosecurity New Zealand was structured to manage risk at three stages:

- (a) Pre-border: broadly speaking, the pre-border stage is everything done to manage risk before the goods actually arrive in New Zealand. It included: standard setting, offshore treatment, inspection and certification by exporting countries and offshore quarantine. An example of MAF's pre-border groups is the Plant Imports team. The first cause of action is concerned with pre-border negligence.
- (b) Border: the border stage involves managing risk from the arrival of goods in New Zealand until clearance is granted. It involves risk-screening, inspection, clearance, quarantine, destruction of goods and so on. The second cause of action is related to negligence at the border stage.
- (c) Post-border: This stage is about the management of biosecurity risks which materialise after crossing the border. It includes: incursion investigation, response, pest management and readiness and preparedness building.

[197] Because actual figures were said to be very difficult to obtain, the following table (from MAF's 2017 budget bid) was provided:

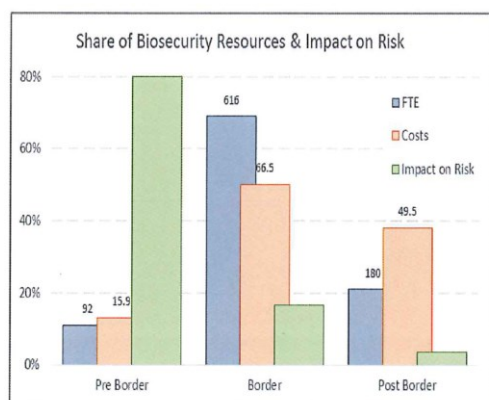


Figure 1: This graph is showing the investment of MPI resources invested across pre border, border, and post border layers as well as the estimated impact these layers have on NZ's biosecurity incursion risk profile

[198] This was described as showing that the biosecurity system is designed to manage the majority of risk before the consignment leaves the exporting country, or ensure the risk goods are placed in a secure environment on arrival until risks can be managed (PEQ); verify that the majority of risks have been managed at the border (including PEQ) before clearance is given; with residual risk (approximately 2 per cent) being managed through MAF's post border activities such as surveillance and responses.

Importing risk goods

[199] At the pre-border stage, one of MAF's functions is to develop IHSs. There are currently 339 IHSs. They range in length from five to over 300 pages. For new IHSs the risk analysis can take weeks to years depending on the number of pests involved and the amount of scientific information available. For example, the recent potential hazard identification for the IHS for pears from China identified 592 pests and diseases; the potential hazard list for a risk assessment for the importation of grapevine material identified more than 800 fungi and viruses.⁶⁴ A number of requests for import permits are also dealt with each year.

⁶⁴ In relation to plants, MAF deals with approximately 24,000 different species which have approximately 15,000 different pests and diseases of concern to New Zealand or associated with them.

[200] The demand for IHSs outstrips (and always has outstripped) supply. There are hundreds of outstanding requests for new IHSs and dozens of requests to amend or review current IHSs. In the relevant period when decision-making occurred regarding pollen imports, the prioritisation of IHS requests was determined by a panel comprising representatives from MAF, MFAT, and the Biosecurity Ministerial Advisory Council. A large range of considerations came into play.

[201] At the border stage a large number of goods arrive for clearance. In 2009, 238,658 sea freight consignments, and 48,283 air cargo consignments were cleared by MAF. Additionally 39.1 million international mail items were cleared. 4.4 million passengers arrived in New Zealand. The figures have increased since 2009.

[202] Approximately 8.1 million import requests, each representing a single cargo consignment, are entered into the New Zealand Customs Service system by importers every year. Each consignment may contain a number of goods. In 2009/10 there were 3.7 million units of nursery stock arriving by air freight and another 16.4 million units arriving by sea freight.

[203] MAF has developed processes for targeting goods that may require particular attention.

Importing kiwifruit plant material and fruit

[204] All plants and plant products are within the definition of “risk goods” under s 2 of the Act. This means an import health standard may be issued specifying requirements for the effective management of the risks associated with their importation. These requirements must be met before they may be imported, moved from a biosecurity control area or a transitional facility, or given biosecurity clearance.⁶⁵

[205] Kiwifruit plant material and fruit are covered by the following IHSs:

⁶⁵ Section 22(1) and s 27(1).

- (a) IHS 155.02: Importation and Clearance of Fresh Fruit and Vegetables into New Zealand.
- (b) IHS 155.02: Seed for Sowing.
- (c) IHS 155.02.06: Nursery Stock.

[206] The Seeds for Sowing IHS contained basic conditions for entry. The basic conditions required that seeds be in clean, new packages and any seed from fleshy fruit have all traces of flesh removed.⁶⁶ Seeds were either required to be imported with a phytosanitary certificate⁶⁷ or they were to be inspected on arrival in New Zealand in accordance with the MAF's Biosecurity New Zealand sampling rules.⁶⁸

[207] The Seeds for Sowing IHS included special conditions for particular kinds of seeds. This included special conditions for *Actinidia* seed (and a list of the *Actinidia* pests was included). These conditions required that seeds be accompanied by a phytosanitary certificate. Before the certificate was issued, the NPPO of the exporting country had to be satisfied the seeds had been inspected in accordance with appropriate official procedures and found to be free of any visually detectable regulated pests. Additionally *Actinidia* seed was required to be imported into post-entry quarantine (in a level 3 accredited facility) where it was to be grown for a minimum period of six months and inspected and tested for regulated pests.⁶⁹

[208] The scope of the Nursery Stock IHS was to describe "the import specifications and entry conditions for nursery stock imported into New Zealand". It defined nursery stock as follows:⁷⁰

Whole plants or parts of plants imported for growing purposes, e.g. cuttings, scions, budwoods, marcots, off-shoots, root divisions, bulbs, corms, tubers and rhizomes.

⁶⁶ Section 2.2.2.1. This was subject to an exception which is not presently relevant.

⁶⁷ Concerning inspection in accordance with official procedures and found to be free of any visually detectable regulated pests and conforming to New Zealand import requirements.

⁶⁸ Section 2.2.2.3.

⁶⁹ Schedule to the IHS.

⁷⁰ The definitions also include a definition of "Unit" as being "[t]he basic element selected for sampling. For nursery stock this unit may be a plant, bulb or cutting. For tissue cultures it is the vessel containing the cultures."

[209] Imported nursery stock was required to meet basic conditions (which applied to nursery stock of any genus). Basic conditions were specified as applying to cuttings, whole plants, dormant bulbs and tubers, and tissue culture. These requirements concerned obtaining a permit, and labelling, cleanliness and phytosanitary certificate requirements. Unless specified otherwise, all nursery stock was also to undergo a period of post-entry quarantine in order to check for the presence of regulated pests and diseases.

[210] Imported nursery stock was also required to meet and any “special conditions”, which applied to specific genera and were contained in a series of schedules. There was an *Actinidia* schedule. This specified dormant cuttings and plants in tissue culture as approved for entry into New Zealand. An import permit and a phytosanitary certificate were required. The phytosanitary certificate was to certify that nursery stock had been inspected and found to be free of any visually detectable regulated pests, and had been treated for regulated insects and mites (cuttings only). On arrival in New Zealand, the nursery stock was required to be grown for a minimum period of six months in a level three post-entry quarantine facility where it would be inspected, treated and/or tested for regulated pests. The regulated pest list for *Actinidia* listed *Pseudomonas syringae* pv *actinidiae* under bacteria.

[211] Pollen was included under the basic conditions section of the Nursery Stock IHS. However no conditions of entry were set out. Instead, it simply stated: “A prior import permit must be obtained from the Permit Officer”. The effect of that was to leave import conditions for assessment at the time that an application to import pollen was received.

Permits issued to Kiwi Pollen

[212] The permits issued by MAF to Kiwi Pollen were as follows:

Application submitted	Application approved	Authorising officer	Exported from	Special conditions	Consignment number
29 March 2007 Permit no 2007031028	16 April 2007	Susan Cooper	Exporter name: Bexley Inc, China Valid for 12 months, multiple consignments	Only hand collected, unopened male flower buds may be collected, milled and imported. Consignments must be accompanied by a government issued phytosanitary certificate stating that the male flower buds were hand collected and unopened.	Permit not used
7 December 2007 Permit no 2007033015	7 December 2007	Wayne Hartley	Exporter name: Chile Valid for 12 months, multiple consignments		Permit not used
3 November 2008 Permit no 2008035594	3 November 2008	Tamsin Hains	Exporter name: Apicola Martinez SRL Country of origin: Chile Valid for 12 months, multiple consignments	Unopened male flower buds must be hand collected. The pollen may be milled prior to import. All consignments must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation of the exporting country with the following Additional Declaration: 'The male flower buds were hand collected and unopened.'	c2008/352699 Arrived 15/12/2008 2.5 kg of pollen c2009/67312 Arrived 28/3/2009 26 kg of pollen
29 April 2009 Permit no 2009036858	30 April 2009	Bryan Rose	Exporter name: Bexley Inc Country of origin: China Valid for 12 months, multiple consignments	As above	c2009/140782 Arrived 24/6/2009 4.5 kg of anthers
29 April 2009 Permit no 2009036865	30 April 2009	Bryan Rose	Exporter name: Apicola Martinez SRL Country of origin: Chile Valid for 12 months, multiple consignments	As above	Permit not used
3 November 2009 Permit no 2009038537	9 October/November 2009	Bryan Rose	Exporter name: Apicola Martinez SRL Country of origin: Chile Valid for 12 months, multiple consignments	As above	c2009/296408 Arrived 28/11/2009 99 kg of pollen c2010/113285 Arrived 30/4/2010 21 kg of pollen
8 June 2010 Permit no 2010040083	9 June 2010	Bryan Rose	Exporter name: Bexley Inc Country of origin: China Valid for 12 months, multiple consignments	As above	c2010/161762 Arrived 06/06/2010 Cleared 16/06/2010

Changes following Psa incursion

Present position on pollen imports

[213] MAF decided to halt import permits for pollen on 12 November 2010 due to increasing concerns from industry around the spread of Psa. The *Actinidia* schedule was suspended in August 2013 which had the effect of stopping the import of everything on that schedule until a full risk analysis was completed. There have not been any pollen imports since then.

MAF procedures

[214] Following the Psa incursion, MAF has made changes. As described by Dr Butcher, the main things that have changed are:

- (a) MAF has a real focus on documenting decisions and information;
- (b) MAF has changed the way that imports are issued so that measures are reflected in the standard rather than the permit; and
- (c) there has been a large increase in staff in the pre-border clearance team.

[215] The increase in staff reflected a number of things, including the increasing trade demands and the need for new IHSs from new markets and goods from those markets.

Industry view on claim

[216] For completeness I note that the industry is divided about this claim. Zespri does not support the claim. Zespri considered that the industry was well into recovery from Psa and the focus should be on that and the industry would be better for working with the government and not against it. A number of growers have the same view.

Litigation funder

[217] This claim has the support of a litigation funder. The High Court granted approval for this.⁷¹

⁷¹ *Strathboss Kiwifruit Ltd v Attorney-General* [2015] NZHC 1596.

Part 3: Duty

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Introduction

[218] Negligence is concerned with a lack of proper care and attention, but not all carelessness gives rise to liability for all the consequences that ensue. The law has developed criteria (or elements) for determining when that liability arises. To make out a negligence claim a plaintiff must establish: a duty of care owed by the defendant to the plaintiff (duty); a breach of that duty (breach); the breach caused the loss

suffered by the plaintiff (causation); and the plaintiff suffered loss which is recoverable (loss which is not too remote).

[219] This part of the judgment is concerned with the criterion of duty. The duty requirement is whether the defendant has a legal responsibility to the plaintiffs for the defendant's conduct. The existence of that responsibility depends on there being the necessary connection between the plaintiffs and the defendant. The situations in which someone's carelessness can cause harm to another are virtually limitless. The nature of the connection required varies between different kinds of cases and there is no all-embracing test which defines the nature of the connection required for all cases. The courts have, through decided cases, established some key issues of principle which provide guidance when a new case comes before them.⁷²

[220] In considering whether a duty of care is owed in a new situation, it is important to keep in mind that all the elements are interlinked. They work together to set the proper boundaries for when a defendant is responsible for the consequences of their carelessness. The factors that bear upon whether a duty of care is owed may overlap with other elements.⁷³ Whether liability for negligence arises should be looked at as a whole.⁷⁴

[221] It is accepted this case raises a novel duty of care. It is novel because the New Zealand courts have not previously decided whether those performing functions under

⁷² S Todd *The Law of Torts in New Zealand* (7th ed, Thomson Reuters, Wellington, 2016) [*Todd on Torts*] at [5.1].

⁷³ For example, in *Couch v Attorney-General (No 1)* [2008] NZSC 45, [2008] 2 NZLR 725 [*Couch (No 1)*] at [43], Elias CJ (with whom Anderson J agreed) considered a statutory duty that involved high level policy need not preclude a duty because it would also be relevant to breach or remoteness of damage.

⁷⁴ See *Dorset Yacht Co Ltd v Home Office* [1970] AC 1004 (HL) [*Dorset Yacht*] at 1052 per Lord Pearson: "The analysis is logically correct and often convenient for purposes of exposition, but it is only an analysis and should not eliminate consideration of the tort of negligence as a whole. It may be artificial and unhelpful to consider the question as to the existence of a duty of care in isolation from the elements of breach of duty and damage. The actual damage alleged to have been suffered by the plaintiffs may be an example of a kind or range of potential damage which was foreseeable, and if the act or omission by which the damage was caused is identifiable it may put one on the trail of a possible duty of care of which the act or omission would be a breach." See also *Sutherland Shire Council v Heyman* [1985] HCA 41 [*Sutherland Shire*] per Deane J; *Wellington District Law Society v Price Waterhouse* [2002] 2 NZLR 767 (CA) per Gault J; and *Couch (No 1)* at [34]-[35] and [41]-[42] per Elias CJ.

the Biosecurity Act owe a duty of care to persons who suffer loss from negligent performance of those functions. In this case:

- (a) The functions at issue concern decisions allowing the importation of “risk goods” (pollen) and clearing those goods at the border.
- (b) The persons to whom the duty is said to be owed are:

<i>Strathboss class</i> ⁷⁵	Categories of loss for which the duty is said to arise
1. Owners and operators	(i) The costs of removing and disposing of kiwifruit vines; (ii) The costs of purchasing and grafting replacing varieties; (iii) Loss of revenue as a result of decreased orchard production; (iv) Spraying costs and other costs associated with mitigating the effects of Psa3; and (v) Increased financing costs relating to the losses in (i) to (iv) above.
2. Owners and lessors	(i) Where a lessor’s costs under the lease, the costs of removing and disposing of kiwifruit vines; (ii) Where a lessor’s costs under the lease, the costs of purchasing and grafting replacing varieties; (iii) Loss, as a result of decreased orchard production, of that part of the rent calculated under the lease by reference to orchard profit; (iv) Loss, as a result of decreased market value of orchard land following Psa3, of rental increases that would otherwise have occurred through rental reviews under the lease; and (v) Increased financing costs relating to the losses in (i) to (iv) above.
3. Operators and lessees	(i) Where a lessee’s cost under the lease, the costs of removing and disposing of kiwifruit vines; (ii) Where a lessee’s cost under the lease, the costs of purchasing and grafting replacing varieties; (iii) Loss of revenue as a result of decreased orchard production; (iv) Spraying costs and other costs associated with mitigating the effects of Psa3; and (v) Increased financing costs relating to the losses in (i) to (iv) above.
4. Growers who sold after testing positive for Psa3	(i) The costs of removing and disposing of kiwifruit vines; (ii) The costs of purchasing and grafting replacing varieties; (iii) Loss of revenue as a result of decreased orchard production; (iv) Spraying costs and other costs associated with mitigating the effects of Psa3; (v) Loss of value of the orchard resulting from the orchard’s decreased production and/or infection with Psa3; and (vi) Increased financing costs relating to the losses in (i) to (v) above.
5. Growers who sold before	(i) The loss of value of the orchard resulting from the introduction of Psa3 into New Zealand and the risk the orchard was or would become infected with Psa3.

⁷⁵ The Strathboss class includes Seeka as a grower, operating a number of kiwifruit orchards under long and short term leases.

testing positive for Psa3	
6. Seeka, as a post-harvest operator (PHO)	<ul style="list-style-type: none"> (i) Loss of profit as a result of reduced volumes of kiwifruit being packed by Seeka (for the years from 2012 to 2016, measured against the profit in the 2011 year); (ii) The costs of staff redundancies due to the decreased volumes of kiwifruit being packed; (iii) Losses resulting from the diminution in value of assets sold after the outbreak of Psa3, as a result of that outbreak (namely the sale of Zespri shares, the sale of an orchard, the sale of a packhouse, the sale in a packing and cool storage company, and the sale of another facility); and (iv) Costs in mitigating losses caused by Psa3 (including additional capital expenditure incurred to increase packing capacity and so maintain overall profits in the face of decreased margins per tray packed after planting of the G3 variety, the costs of grower incentive schemes that were implemented to encourage growers to pack fruit with Seeka; the net costs of developing the Seeka Psa lab).

[222] As an indication of the quantum of loss claimed, Strathboss (as one member of the class it represents) calculates its losses as totalling over \$8.7 million (over \$300,000 in removing and replacing vines, over \$8 million in lost revenue over the periods between 2012 and 2014, and over \$300,000 in mitigating costs). Seeka, in its capacity as a PHO, calculates its losses as totalling over \$92.5 million.⁷⁶ The losses suffered by the grower entities represented by Strathboss are additional to these sums. There are 212 of these grower entities in the class represented by Strathboss.⁷⁷

The methodology

[223] The methodology for determining whether a duty of care exists in a novel case was confirmed by the Supreme Court in *North Shore City Council v Attorney-General (The Grange)*, one of a number of cases involving defective buildings that have reached that Court.⁷⁸ As explained in the principal judgment,⁷⁹ the framework for determining whether a duty of care arose has two stages.

⁷⁶ Both Strathboss and Seeka have given more precise calculations in the pleadings, but these details are not material for present purposes.

⁷⁷ *Strathboss Kiwifruit Ltd and Seeka Kiwifruit Industries Ltd v Attorney-General* [2015] NZHC 1596 (Dobson J's judgment granting approval to bring the class action).

⁷⁸ *North Shore City Council v Attorney-General* [2012] NZSC 49, [2012] 3 NZLR 341 [*The Grange*].

⁷⁹ Judgment of Blanchard J on behalf of himself, McGrath and William Young JJ.

[224] The first stage concerns foreseeability and proximity. It is concerned with everything bearing upon the relationship between the parties (internal factors). Foreseeability in novel cases is “at best a screening mechanism, to exclude claims which must obviously fail because no reasonable person in the shoes of the defendant would have foreseen the loss”.⁸⁰ Assuming foreseeability is established in a novel situation, the Court must then address the more difficult question of whether foreseeable loss occurred within a relationship that was sufficiently proximate. This is usually the hardest part of the inquiry.⁸¹ The concept of proximity is focussed on “the closeness of the connection between the parties”.⁸² A number of factors are relevant to this assessment. The proximity assessment enables the balancing of the moral claims of the parties: the plaintiff’s claim for compensation for avoidable harm and the defendant’s claim to be protected from an undue burden of legal responsibility.⁸³

[225] The second stage is concerned with policy features which means it is not fair, just and reasonable to impose a duty despite the internal factors which have pointed to a duty of care at the first stage. This second stage is concerned with external factors. That is, the effect on non-parties and on the structure of the law and on society generally.⁸⁴ The second stage encompasses “a relatively small number of cases” in which a court will find no duty of care existed even though the loss was foreseeable and the relationship sufficiently proximate.⁸⁵ This might involve considerations of indeterminate liability, the capacity of each party to insure against the liability, the likely behaviour of other potential defendants in reaction to the decision, and whether imposing liability is consistent with the legal system more generally.⁸⁶

⁸⁰ *The Grange* at [157] per Blanchard J.

⁸¹ At [158] referring to, amongst other things, Lord Oliver in *Alcock v Chief Constable of South Yorkshire* [1992] 1 AC 310 (HL) at 411 “that the concept of proximity is an artificial one which depends more on the Court’s perception of what is a reasonable area for the imposition of liability that upon any logical process of analogical deduction”. Also referring to S Todd (ed) *The Law to Torts in New Zealand* (5th ed, Brookers, Wellington, 2009) at 143, that it is “a means of identifying whether the defendant was someone most appropriately placed to take care in the avoidance of damage to the plaintiff”.

⁸² *The Grange* at [158].

⁸³ At [159] citing Richardson J in *Fleming v Securities Commission* [1995] 2 NZLR 514 (CA) at 532.

⁸⁴ At [156].

⁸⁵ At [160].

⁸⁶ At [160].

[226] The two stages are not a “straightjacket”.⁸⁷ There may be some overlap in the features considered at the first and second stages. The exact methodology employed is not of paramount importance, providing all the salient features of a case are identified and considered.⁸⁸

Tort law theory

[227] As this is a novel case for a duty of care, and the framework to determine it involves judgments to be made on proximity and consideration of policy factors, some further context on the role of negligence in the law may be helpful. Negligence is a component of tort law. Tort law has the primary function of compensating injuries or losses.⁸⁹

[228] As one academic writer put it:⁹⁰

Arising out of the various and ever-increasing clashes of the activities of persons living in a common society, carrying on business and competition with fellow members of that society, owning property which may in any of a thousand ways affect the person or property of others – in short, doing all the things that constitute modern living – there must of necessity be losses, or injuries of many kinds sustained as a result of the activities of others. The purposes of the law of torts is to adjust these losses and afford compensation for injury sustained by one person as the result of the conduct of another.

[229] The law does not, however, attempt to compensate all losses. There are two basic interests which are in tension: the interest in security (that is, a person’s demand for protection against injury) and the interest in freedom of action. Tort law adjudicates on these interests when they clash. It aims to do so in a way conducive to the public good.⁹¹

⁸⁷ *Rolls-Royce New Zealand Limited v Carter Holt Harvey* [2005] 1 NZLR 324 (CA) at [58] per Glazebrook J.

⁸⁸ *The Grange* at [161] per Blanchard J.

⁸⁹ C Sappideen and P Vines (ed) *Fleming’s The Law of Torts* (10th ed, Thomson Reuters Sydney, 2011) [*Fleming’s The Law of Torts*] at 4.

⁹⁰ Wright “Introduction to the Law of Torts” (1942) 8 Cam LJ 238 cited in *Fleming’s The Law of Torts* at 5.

⁹¹ *Fleming’s The Law of Torts* at 8.

[230] As another writer put it, tort law does not sanction every act or omission which interferes with or damages some protected interest of the victim; nor are all legally recognised interests protected by tort law:⁹²

The imposition of tort liability limits people's freedom of action in a significant way by making certain causes of action (or inaction) more costly than they would otherwise be. The imposition of tort liability on someone will also typically reduce that person's wealth because the effect of granting a judicial remedy will usually be to make the defendant worse off and the plaintiff better off. Because the imposition of tort liability on a person significantly impinges on that person's freedom of action and reduces their financial wealth, the law, to be fair, must strike a balance between the interests of victims and the interests of injurers.

[231] Two main factors are relied on in tort law in assessing how losses should be allocated:⁹³

- (a) The type of interest at stake: traditionally the law has been more concerned about protecting against bodily injury and physical damage than a detriment to a person's financial position.⁹⁴
- (b) The degree of fault by the person who caused the loss:⁹⁵ deliberate injury to others is almost invariably devoid of social utility. Protection of others against unintended harm requires a more nuanced assessment.⁹⁶

⁹² P Cane *The Anatomy of Tort Law* (Hart Publishing, Oxford, 1997) [*The Anatomy of Tort Law*] at 14.

⁹³ *Fleming's The Law of Torts* at 6-10. See also C Witting (ed) *Street on Torts* (14th ed, Oxford University Press, Oxford, 2015) at 1.

⁹⁴ *Fleming's The Law of Torts* at 6.

⁹⁵ *Fleming's The Law of Torts* at 9-10 explains that many torts are now fault-based but that was not always the case. In earlier times the law was focussed on preserving the peace and providing a substitute for private vengeance. It looked to causation rather than fault. Gradually the law began to pay greater heed to exculpatory considerations and, particularly under the influence of the church, tilted towards moral culpability as the proper basis for tort. During the 19th century the courts attached increasing importance to freedom of action and ultimately yielded to "no liability without fault". This coincided with, and was influenced by, the demands of the industrial revolution. Fault justified a shifting of loss because the function of tort remedies was seen as primarily admonitory or deterrent. In a sense it was an adjunct to the criminal law designed to induce anti-social and inconsiderate persons to conform to the standards of reasonable conduct prescribed by law. *Fleming's* cites Holmes *Common Law* (Macmillan, London, 1881) at 144: "the true explanation of the reference of liability to a moral standard ... is not that it is for the purpose of improving men's hearts, but that it is to give a man a fair chance to avoid doing the harm before he is held responsible".

⁹⁶ *Fleming's The Law of Torts* at 6-7, elaborating that accidental harm may have been caused either negligently or without fault at all. If it is caused negligently, this will often supply a reason for tilting the balance against the actor but much depends on the nature of the plaintiff's interest that has been violated. A duty to not expose others to unreasonable risks is most generally recognised

[232] While these are the main factors, there is no universal theory or aim underlying all tort law against which these factors are assessed.⁹⁷ Dominant theories of tort law aims are:⁹⁸

- (a) Corrective justice: where a wrong is done by one person to another, it must be corrected by compensation to equalise the “moral” balance between the two parties.⁹⁹ This is about making good certain alterations to the distribution of wealth or benefits in society. The person causing the alteration is held responsible.
- (b) Distributive justice: the law should allocate risks and losses according to broader utilitarian goals. This is about the way wealth and other benefits are distributed throughout society.¹⁰⁰

[233] As one academic writer puts it:¹⁰¹

Some people say that the law of tort is best explained in terms of corrective justice. On this view, it is a set of rules concerned, and concerned only, with correcting disturbances to the distribution of resources in society which come about in certain ways. ... Once we take account of the fact that court decisions can create precedents which can be used to guide people’s conduct and to decide disputes other than that before the court, we can see that the law is also concerned with distributive justice. ... When we make judgments about the

with reference to physical harm to persons or tangible things. More reservations have been evident in regard to purely financial loss.

⁹⁷ In a relatively recent article, James Goudkamp “The Failures of Universal Theories of Tort Law” (2015) 21 LEG 476, the author discusses the corrective justice, rights theory and economic theory of tort law as put forward by Ernest Weinrib, Robert Stevens and Richard Posner (respectively). Goudkamp concludes that none are a satisfactory universal account of tort law.

⁹⁸ *Fleming’s The Law of Torts* at 8-15; *The Anatomy of Tort Law* at 17, and *Todd on Torts* at 14-17. See also *The Anatomy of Tort Law* at 14 where Cane describes the social goals most commonly associated with tort law as being compensation for injuries and losses, deterrence of harmful conduct, fair distribution of accident risks and costs throughout society, and economic efficiency.

⁹⁹ Another way of putting this, from *Clements v Clements* 2012 SSC 31, [2012] 2 SCR 181 at [7] per McLachlin CJ is: “If the defendant breaches this duty and thereby causes injury to the plaintiff, the law “corrects” the deficiency in the relationship by requiring the defendant to compensate the plaintiff for the injury suffered. This basis for recovery, sometimes referred to as “corrective justice”, assigns liability when the plaintiff and defendant are linked in a correlative relationship of doer and sufferer of the same harm: E. J. Weinrib, *The Idea of Private Law* (1995), at p. 156.”

¹⁰⁰ As *Fleming’s The Law of Torts* discusses at 11-13, if a certain type of loss is regarded as the more or less inevitable by-product of a desirable but dangerous activity, it may well be just to distribute its costs among all who benefit from that activity. This leads to the selection of defendants because they represent a conduit for internalising the accident cost to the risk-creating activity and distributing it among its beneficiaries through higher prices and/or liability insurance. Sometimes this approach points to the victim as the better loss bearer, when the victim can better calculate and control the risk. More often, however, it points to the injurer.

¹⁰¹ *The Anatomy of Tort Law* at 18.

fairness of rules of tort law, independently of their application to the facts of individual cases, we are commenting on whether the distribution of legal rights and obligations established by those rules is fair.

[234] This recognises that tort liability may influence behaviour.¹⁰² It may, for example, deter people from intentional harmful conduct. It may influence human conduct *ex ante* (before accidents) and lead to an efficient use of resources.¹⁰³ But where harm is accidentally caused, there may be other more effective mechanisms for maintaining standards (for example, regulatory control, education and training and disciplinary procedures), and more efficient mechanisms or mechanisms more beneficial to society for compensating for the harm. In New Zealand, for example, the accident compensation scheme has replaced the role of tort law in compensating for negligently inflicted physical injury.¹⁰⁴ A focus on efficiency in determining tort liability also requires predictions about behaviour without all the relevant information and it may overlook the human dimension of who should bear the costs of an accident.¹⁰⁵

A brief history to the development of negligence liability

[235] Negligence is a fault based tort. It is a cause of action developed by the courts over centuries. The early cases all concerned harm to persons or their property caused by another's carelessness. A claim could be brought in particular kinds of cases.¹⁰⁶ In

¹⁰² See, for example, Hammond J in *Couch v Attorney General* [2007] 1 NZLR 374 (CA) at [75] that: "For at some level, tort law is concerned with social accountability ... Are the huddled survivors of these appalling kinds of events to be left in the quagmire of an inadequate institutional response ... Unsurprisingly Ms Couch, in particular, sees her proceeding as one in which she seeks "public accountability" that she cannot get elsewhere. Hence the argument is run that, where it is apparent that resources or abilities have fallen woefully short, courts should not be deterred and, beneficially, should lay down duties of care that may then require some executive response."

¹⁰³ *Fleming's The Law of Torts* at 14 explains the theory is that the price of an entity's products will reflect the cost of its accidents and affect their competitive attraction to consumers, hopefully either stimulating a remedial managerial response or a reduction of consumer demand. Either way, the theory is that this assists the efficient allocation of resources.

¹⁰⁴ *Fleming's The Law of Torts* at 14 discusses the strong influence on loss distribution of the modern prevalence of liability insurance. An adverse judgment no longer merely shifts the loss from one individual to another, but tends to distribute it among all policy holders carrying insurance on this type of risk. Without liability insurance, the tort system would long ago have collapsed under the weight of the demands put on it, having been replaced by an alternative, and perhaps more efficient, system of accident compensation.

¹⁰⁵ See, for example. *Todd on Torts* at 16-17; *Street on Torts* at 18-19; Goudkamp "The Failures of Universal Theories of Tort Law" at 55-56: breach is not simply an economic assessment of the burden of taking precautions as against the probability of loss and the loss itself. Immeasurable values such as community concepts of justice, health, life and freedom of conduct have to be taken into account.

¹⁰⁶ As discussed in *Todd on Torts* at 150.

the late 19th century a Judge proposed a statement of broad principle about when a negligence claim could be brought. This statement was based on an objective view of whether it was obvious that if a person did not take care they would harm another person's person or property. It did not gain any support at the time.¹⁰⁷

[236] However, in the famous case of *Donoghue v Stevenson*, decided in the United Kingdom in the early 1930s, a statement of principle was set down which became the cornerstone of the modern law of negligence.¹⁰⁸ The case involved a person who suffered physical harm from drinking a ginger beer that had been contaminated with a snail. The person sued the manufacturer of the ginger beer for negligence even though she had purchased the ginger beer from the café (not the manufacturer). In finding a duty of care was owed by the manufacturer to a person consuming its products, Lord Atkin considered a duty of care to one's "neighbours" arose in law.¹⁰⁹ A neighbour was someone.¹¹⁰

... so closely and directly affected by my act that I ought reasonably to have them in contemplation as being so affected when I am directing my mind to the acts or omissions which are called in question.

[237] The case involved personal injury caused by a positive act. Foreseeability of injury was seen as a sufficient connection between the manufacturer and the consumer. Since that decision, a duty of care will normally be owed where a person who is negligent, through their positive conduct, causes personal injury to another person, or causes physical damage to a person's building or personal property.¹¹¹ That is, there is a duty of care not to inflict physical or property damage on another.

[238] Conversely, there is no general duty to take care to prevent injury to another (omissions to act).¹¹² This is consistent with the principle of individual autonomy. Imposing a duty of care requiring a person to help another is a constraint on their freedom of choice. It may cut across the principles of contract (under which a person

¹⁰⁷ *Todd on Torts* at 151 discussing *Heaven v Pender* (1883) 11 QBD 503 (CA).

¹⁰⁸ *Donoghue v Stevenson* [132] AC 562 (HL) [*Donoghue v Stevenson*], discussed in *Todd on Torts* at 151-153.

¹⁰⁹ *Donoghue v Stevenson* at 580 per Lord Atkin. *The Anatomy of Tort Law* at 7 describes that, underlying *Donoghue v Stevenson*, "lay an ethical injunction of extremely wide potential scope – namely take care not to injure your 'neighbours'".

¹¹⁰ *Donoghue v Stevenson* at 580-581 per Lord Atkin.

¹¹¹ *Todd on Torts* at 174-182.

¹¹² Nor to confer a benefit on another person.

may agree to bear the burden of an undertaking in return for a benefit). It may be unclear who, of a range of people aware of the risk of injury, had the duty to act. There is also a risk of opening up wide and uncertain areas of responsibility. It may require someone to become involved in dangerous or otherwise burdensome activities for which they may not be suited and for which there may be no reward. There are, however, situations where a duty to act will arise. This might be because the omission to act is part of wider positive conduct, or because the plaintiff reasonably relied on the defendant to act for her benefit, or where the defendant exercised control over or assumed responsibility for the circumstances giving rise to the danger.¹¹³

[239] An example is provided by another well-known case, *Dorset Yacht*, decided in the 1970s. The case involved employees of the Home Office in the United Kingdom negligently supervising borstal trainees who they had taken to an island to carry out some work. When the trainees were left to their own devices, they boarded a boat and crashed it into another boat. The Home Office was held to owe a duty of care to the plaintiffs as property owners in the vicinity of the place from where the trainees had escaped. The duty arose, despite the fact the trainees were adults engaged in deliberate criminal activity, because the trainees were under the control of the Home Office employees. *Couch (No 1)*, discussed further below, is a recent New Zealand case where a duty of care was held to be arguable in a broadly analogous situation.

[240] There is more controversy around when a duty of care will arise for financial loss.¹¹⁴ Financial loss consequential on physical injury or property damage has traditionally been recoverable.¹¹⁵ A wide view of what is consequential has been taken in New Zealand.¹¹⁶ In contrast, traditionally, pure economic loss (that is, economic loss not consequential on physical or property damage) was not recoverable at all.

¹¹³ *Todd on Torts* at 182-186.

¹¹⁴ *Todd on Torts* at 175.

¹¹⁵ For example, as *Todd on Torts* discusses at 257, in pre-accident compensation days a large part of the total damages in personal injury claims would often be for loss of earnings and medical expenses.

¹¹⁶ *Todd on Torts* at 258 refers to *Taupo Borough Council v Birnie* [1978] 2 NZLR 397 (CA) where a plaintiff, whose hotel was flooded by the defendant's actions, was able to recover for loss of profits not only on the basis that some rooms were unavailable for a period, but also because travellers and travel agents were deterred from making future bookings because of doubts about whether satisfactory accommodation would be available.

[241] A ground-breaking decision on this topic was *Hedley Byrne*, another decision in the United Kingdom, decided in the 1960s.¹¹⁷ This case recognised a negligence claim could be made for negligent statements which caused only financial loss (not physical or property damage). As explained and developed in later cases (including in New Zealand), a duty of care in such cases requires that it be reasonable for the plaintiff to have relied on the statement, that the plaintiff has in fact relied on the statement, and that the defendant has assumed responsibility for the statement or there is a relationship of sufficient proximity between the plaintiff and the defendant so as to justify imposing a duty of care on the defendant.¹¹⁸

[242] More difficult are cases where a large range of people may rely on the information. The provider of the service may be unable to spread the costs of mistakes, except through insurance which may become prohibitively expensive and lead to a shrinkage of a publicly beneficial service.¹¹⁹ More generally there are issues about when, outside of the *Hedley Byrne* situation, recovery for pure economic loss should be permitted. Concerns include the prospect of imposing disproportionate risk on defendants and the appropriate boundaries of negligence law as against other areas of the law.

[243] The next significant development was *Anns* decided by the House of Lords in the late 1970s.¹²⁰ It was held that, following *Donoghue v Stevenson*, *Hedley-Byrne* and *Dorset Yacht*, a two-staged test was to be applied for deciding whether a duty of care would exist. The first stage asked whether there was a relationship of sufficient proximity between the plaintiff and defendant. This involved asking whether it was reasonably foreseeable that the plaintiff would suffer loss from the defendant's carelessness. If so, a prima facie duty of care arose. The second stage asked whether there were considerations which negated or reduced the limit or scope of the duty,

¹¹⁷ *Hedley Byrne & Co Ltd v Heller & Partners Ltd* [1964] AC 465 (HL) [*Hedley Byrne*]. Discussed in *Todd on Torts* at 228-230.

¹¹⁸ Discussed in *Todd on Torts* at 226-245. Under the *Hedley Byrne* line of authority a duty will commonly be found where a skilled person, acting in a business context, gives misleading information or advice directly to another person, knowing the specific purpose for which the information is wanted, and knowing the person attaches importance on it.

¹¹⁹ Discussed in *Todd on Torts* at 226-245 or [5.8] more generally.

¹²⁰ *Anns v Merton London Borough Council* [1978] AC 465 (HL) [*Anns*].

or the class of persons to whom it was owed, or the damages to which a breach may give rise.

[244] *Anns* involved a house with defective foundations. The owner of the property brought a claim against a local authority for failing to take care in inspecting the foundations. The House of Lords regarded the claim as one involving physical damage to the property. The plaintiff could recover against the local authority for the cost of restoring the property to a condition where it was no longer a present or imminent danger to the health or safety of persons occupying it.

[245] Following *Anns*, courts began to wrestle with the judgment's limits. There were two perceived problems with it:

- (a) First, whether, when a house had defective foundations, the damage was properly categorised as physical damage. That categorisation could lead to arbitrary distinctions between claims (depending on whether defective foundations gave rise to an imminent risk to the health or safety of those occupying it or had given rise to structural damage requiring repairs, and those which had not given rise to either of those things). Further, there were issues about when the damage occurred for the purposes of determining whether a claim was time-barred.¹²¹ These issues led to the courts later deciding the true nature of the claim in *Anns* was for pure economic loss.¹²²
- (b) Secondly, the test was one of potentially very wide application. This was especially the case if it applied to all claims for pure economic loss (that is, claims not for injury to persons or damage to property, or closely

¹²¹ *Invercargill City Council v Hamlin* [1994] 3 NZLR 513 (CA) at 522 per Cooke P: "As Miss French argued, in a house-building case where the basic defect is in the foundations, classifying the damage as economic assists the conclusion that, time runs from the date when a significant defect in the foundation is or ought to have been discovered." Compare with McKay J (dissenting) at 545 who considered the limitation defence applied based on when observable damage to the house occurred. An appeal in *Invercargill City Council v Hamlin* [1996] 1 NZLR 513 (PC) at 526 Lord Lloyd of Berwick said: "Once it is appreciated that the loss in respect of which the plaintiff in the present case is suing is loss to his pocket, and not for physical damage to the house or foundations, then most, if not all the difficulties, surrounding the limitation question fall away."

¹²² *Todd on Torts* at 299-304 discusses the cases following *Anns* leading to the view that the claim was properly categorised as one for pure economic loss.

associated with such claims). Foreseeability was a low threshold for a prima facie duty of care in such cases.

[246] As it was put in the recent decision of the Supreme Court of the United Kingdom in *Robinson, Anns* was seen as having:¹²³

... major implications for public authorities, as they have a multitude of functions designed to protect members of the public from harm of one kind or another, with the consequence that the first stage inquiry was readily satisfied, and the only limit to liability became public policy.

Anns led to a period during which the Court struggled to contain liability, particularly for economic loss unassociated with physical damage or personal injury, and for the acts and omissions of public authorities.

[247] These problems led to different responses in the United Kingdom and New Zealand.¹²⁴ In the United Kingdom the response was two-fold:

- (a) First, in *Murphy v Brentwood District Council*, a decision of the House of Lords in the early 1990s, it was held that when a house has defective foundations the nature of the loss was economic.¹²⁵ It was further held that the local authority owed no duty of care to the owner for this kind of loss in approving a faulty design for the foundations. Such a duty would open up a wide field of claims as it would be akin to an indefinite transmissible warranty of quality. Protection of house owners was better left to the legislature.
- (b) Secondly, the courts moved away from the two-staged test in *Anns* as a statement of universal principle. In *Caparo Industries plc v Dickson*, a decision of the House of Lords decided a year earlier than *Murphy*, the Court regarded foreseeability, proximity and considerations of fairness and justice as no more than convenient labels which attach to the features of different situations which, on a detailed examination of all the

¹²³ *Robinson v Chief Constable of West Yorkshire Police* [2018] UKSC 4 [*Robinson*] at [22]-[23] per Lord Reed (with whom Lady Hale and Lord Hodge agreed).

¹²⁴ And also in Canada and Australia.

¹²⁵ *Murphy v Brentwood District Council* [1991] 1 AC 398 (HL) [*Murphy*]. In this case the defective foundations later caused the house to crack and subside. The owner did not carry out repairs. Instead the house was sold and the claim was for difference in the market value of the house in its damaged state and if it had been undamaged.

circumstances, the law recognises pragmatically as giving rise to a duty of care of a given scope.¹²⁶

[248] Most recently, the approach to be taken in the United Kingdom is explained in *Robinson*. The lead judgment, given by Lord Reed, emphasised that the *Caparo* test does not set down a single test to be applied in all cases in order to determine whether a duty of care exists.¹²⁷ There are many situations in which it has been established that a duty of care is or is not owed. Once that decision is made, it applies to all future cases of the same kind. It then becomes unnecessary and inappropriate to reconsider whether the relevant existence of the duty is fair, just and reasonable.

[249] *Robinson* further explained that it is normally only in a novel type of case, where established principles do not provide an answer, that the courts need to go beyond those principles in order to decide whether a duty of care should be recognised.¹²⁸ In cases where the question whether a duty of care arises has not previously been decided, the courts will consider the closest analogies in the existing law, with a view to maintaining the coherence of the law and the avoidance of inappropriate distinctions. They will also weigh up the reasons for and against imposing liability in order to decide whether the existence of a duty of care would be just and reasonable.¹²⁹

[250] In New Zealand:

- (a) The courts have continued to examine whether a novel duty of care is owed broadly along the lines of the two-staged framework of *Anns*, but reformulated as set out in “The Methodology” section above. Ultimately the court makes a value judgment based on its assessment of all the relevant circumstances.¹³⁰

¹²⁶ *Caparo Industries plc v Dickman* [1990] 2 AC 605 (HL) [*Caparo*]. See the discussion of *Todd on Torts* at 153-154.

¹²⁷ The lead judgment considered the Court of Appeal had erred in this respect.

¹²⁸ *Robinson* at [27] per Lord Reed.

¹²⁹ At [29].

¹³⁰ *Todd on Torts* at 157-158.

- (b) As in the United Kingdom, the courts have viewed the liability for defective construction of a house as pure economic loss.¹³¹ In contrast with the United Kingdom, the courts have adhered to the view that a duty of care is owed by a local authority for negligent approval/supervision of a building and approval of remedial work. As discussed in more detail later, this has been extended to multi-unit and mixed-use developments and to commercial premises.¹³² Pure economic loss is regarded as recoverable as a matter of ordinary principle and is simply one of the factors to be taken into account in weighing up whether a duty is owed.

Particular issues

Recovery for economic loss

[251] On the New Zealand approach that pure economic loss is one of the factors to be taken into account in weighing up whether a duty is owed, the question arises as to what other factors are relevant in such a claim. From a review of cases, Professor Todd summarises the policy reasons which have tended to negate a duty as follows:¹³³

- (a) where a duty would be inconsistent with contractual obligations;
- (b) where a duty might conflict with a professional's obligations to her client;
- (c) where a duty is unnecessary because the plaintiff has other avenues for protection from harm or loss;
- (d) where the duty concerns a failure to act;
- (e) where statutory functions under which a defendant is acting are for purposes other than the protection of the economic interests of the plaintiff; and

¹³¹ The cases were initially about defective foundations and in more recent times concern "leaky" buildings.

¹³² See "New Zealand examples" discussion below.

¹³³ *Todd on Torts* at 273-276.

- (f) where a duty would undermine an existing principle of law.

[252] A particular kind of economic loss, of relevance to the present case, is “relational economic loss”. This is loss which a plaintiff suffers because of her relationship to the immediate victim of a negligent act. Professor Todd gives the simple example of a doctor owing no duty of care to her patient’s employer, when treating the patient.¹³⁴

[253] An example of this principle, in a case which has more similarity to the present, is *Weller & Co v Foot and Mouth Disease Research Institute*, a decision in the United Kingdom in 1965.¹³⁵ It involved a research institute which had imported the foot and mouth disease virus from Africa in order to carry out research. Cattle in the vicinity of the research premises then became infected. The Ministry of Agriculture, pursuant to statutory powers, ordered the slaughter of some cattle and placed movement restrictions on other cattle. A claim was brought against the research institute by cattle auctioneers who suffered financial loss from not having cattle to auction.¹³⁶

[254] The court accepted economic damage may be just as real as direct physical injury. But:¹³⁷

The world of commerce would come to a halt and ordinary life would become intolerable if the law imposed a duty on all persons at all times to refrain from any conduct which might foreseeably cause detriment to another.

[255] Direct injury to a plaintiff was necessary. The Court considered a duty of care was owed by the research institute to those who suffered direct injury to their property (here, the cattle owners)¹³⁸ but not to those who did not (here, the cattle auctioneers). The scope of the potential liability in such cases, if some limit was not placed upon it, was described as follows:¹³⁹

¹³⁴ At 258 citing *West Bromwich Albion Football Club Ltd v El-Safty* [2006] EWCA Civ 1299.

¹³⁵ *Weller & Co v Foot and Mouth Disease Research Institute* [1966] 1 QB 569 (QB) [*Weller & Co*].

¹³⁶ A claim against the Minister of Agriculture was discontinued. The report of the case does not discuss why that was.

¹³⁷ *Weller & Co* at 585 per Widgery J.

¹³⁸ There is no information in the report of the decision about whether the cattle owners, who were not a party to the proceeding, had received any compensation from the Ministry or the Research Institute.

¹³⁹ *Weller & Co* at 577 per Widgery J.

Mr. Eveleigh says that, since the defendants should have foreseen the damage to his clients but nevertheless failed to take proper precaution against the escape of the virus, their liability is established. It may be observed that if this argument is sound, the defendants' liability is likely to extend far beyond the loss suffered by the auctioneers, for in an agricultural community the escape of foot and mouth disease virus is a tragedy which can foreseeably affect almost all businesses in that area. The affected beasts must be slaughtered, as must others to whom the disease may conceivably have spread. Other farmers are prohibited from moving their cattle and may be unable to bring them to market at the most profitable time; transport contractors who make their living by the transport of animals are out of work; dairymen may go short of milk, and sellers of cattle feed suffer loss of business. The magnitude of these consequences must not be allowed to deprive the plaintiffs of their rights, but it emphasises the importance of this case.

[256] *Weller & Co* was a classic case of what is sometimes called contractual relational loss. That is, where property is damaged and someone who is not the owner, but who enjoys a contractual right to use or otherwise take a benefit from the property, suffers financial loss. In such cases concerns about indeterminate liability, and questions about the relative abilities of plaintiffs and defendants to protect themselves, arise.¹⁴⁰ Because of this, although in New Zealand such cases are not ruled out altogether, there is a need for special caution.¹⁴¹

[257] Some 40 or so years later, the foot and mouth virus again escaped from the same site that had been the subject of *Weller & Co*. That research site was then used by new operators (one a publicly funded limited liability company with charitable status and the other a privately owned joint venture).¹⁴² Following the outbreak livestock confirmed as, or suspected of being, infected with the virus were required to be slaughtered. Restraints on the movement of livestock and related material (carcasses, manure, slurry or used litter from slaughterhouses) were also put in place. Legislation provided for compensation to be paid to the owners of the slaughtered livestock. This was paid on the basis of the value of the animal immediately before it was infected or slaughtered. No compensation was payable under the legislation for

¹⁴⁰ *Riddell v Porteous* [1999] 1 NZLR 1 (CA) at 9 per Blanchard J. Also see the discussion in *Todd on Torts* at 264-266. *Riddell* involved a relational transferred loss which did not give rise to concerns about indeterminate liability.

¹⁴¹ *Todd on Torts* at 264-266.

¹⁴² *D Pride & Partners v Institute for Animal Health* [2009] EWHC 685 (QB), [2009] NPC 56 [*D Pride*] at [27] records that between 1922 and 1967 there were only two years in which Great Britain was free of foot and mouth disease. The case concerned an outbreak in 2007.

consequential losses. However the government put in place a support package of £12 million for farmers affected by the movement restrictions.

[258] A claim for consequential losses was brought by farmers whose livestock had been slaughtered. An operator settled this claim. A second category of farmers also brought a claim. They did not have livestock which had been slaughtered. Rather they suffered loss from livestock movement restrictions put in place by the Government to prevent the spread of the disease. These farmers had not been eligible for payments from the support package. They brought their claim against the two operators and the Government. They alleged the operators had failed to take reasonable care so as not to cause the escape of the virus. They alleged the Government failed to take reasonable care in licensing the operators to work with the virus so as not to cause its escape from the site.

[259] These claims were dismissed in *D Pride* (a first instance decision). This was because the farmers had not suffered any direct physical injury. Nor did they claim to have suffered losses from contracts with farmers whose livestock was slaughtered. Their claim was one step removed even from the auctioneers in *Weller & Co* whose claim had failed. Moreover the restrictions applied to all of Great Britain and were not confined just to livestock. The claimants did not allege anything to distinguish themselves from every other livestock farmer in Great Britain or other business affected by the measures (such as auctioneers, hauliers and slaughterhouse owners). The Judge considered the potential claimants were too great and the claimants were not a uniquely prominent class.

[260] A case which allowed claims for relational economic loss is *Perre v Apand Pty Ltd*, a decision of the High Court of Australia.¹⁴³ The case involved defendants who sold seed potatoes to a potato grower in South Australia. The seed produced a crop that suffered from bacterial wilt. Western Australian regulations prohibited the import of potatoes from within a 20 km buffer zone around the infected property. The plaintiffs were made up of growers, processors and landowners in the potato industry affected by the regulations. The Court considered they could all succeed against the

¹⁴³ *Perre v Apand Pty Ltd* [1999] HCA 36, (1999) 198 CLR 180 [*Perre*].

seed seller. They were an ascertainable class, and they were vulnerable to harm and could not protect themselves against the effects of negligence.

[261] *Perre* was considered in *D Pride* but distinguished on the basis of the “very much greater” class of potential claimants affected by the foot and mouth disease.¹⁴⁴ Although the class was smaller in *Perre*, as Professor Todd discusses, it has been criticised for its failure to make distinctions between the relevant plaintiffs. Only one plaintiff was a grower that was unable to export its crop to Western Australia. It could be said that this plaintiff suffered direct loss (its crop being treated by the regulations as though it was infected by the blight). The other plaintiffs suffered loss because of their relationship with the plaintiff (suppliers and land owners). Their loss was therefore relational economic loss. Allowing their claims expanded the scope of the defendant’s liability potentially giving rise to indeterminate exposure. These plaintiffs were also not necessarily especially vulnerable because they may have been able to allocate their losses to the growers in their contractual arrangements with them.¹⁴⁵

[262] In short, a claim for pure economic loss raises concerns about indeterminate and disproportionate liability. A mechanism that responds to this concern is to confine the duty only to those who suffer direct loss, rather than loss because someone else has suffered loss.

Public authorities

[263] Public bodies are generally under a duty of care to avoid causing actionable harm in situations where a duty of care would arise under the ordinary principles of the law of negligence. This general principle is subject to the common law or statute under which the public body operates. Police therefore owed a duty of care to a bystander who was injured in the course of a police arrest of a drug dealer effected on a public street¹⁴⁶ (a case of positive action causing physical harm to another); but a highway authority did not owe a duty to road users for failing to maintain a visible “slow” marking on a dangerous part of the road because occupiers of land are under

¹⁴⁴ *D Pride* at [126] per Tugendhat J.

¹⁴⁵ *Todd on Torts* at 263.

¹⁴⁶ *Robinson*.

no duty to give warning of obvious dangers and the duties of a highway authority are narrowly defined at common law and by statute.¹⁴⁷

[264] This principle was reiterated in *Robinson*.¹⁴⁸ It is also the position that applies in this country. As it was put in *Couch (No 1)*:¹⁴⁹

... public bodies are liable in tort in the same way as private individuals. If public bodies act to create a danger or cause direct harm through use of their powers, there is no impediment to their liability on ordinary principles, unless such liability is inconsistent with the statute conferring their powers.

[265] As Professor Todd says, this is not the same as concentrating on the statute's purpose. A claim for negligence does not depend on whether the legislature intended that there be such a claim. That confuses a claim for breach of statutory duty with a claim for negligence.¹⁵⁰ As Lord Steyn explained in *Gorringe v Calderdale Metropolitan Borough Council*, in cases founded on breach of statutory duty the central question is whether from the provisions and structure of the statute a legislative intention to create a private law remedy can be gathered,¹⁵¹ whereas in a case framed in negligence "against the background of a statutory duty or power, a basic question is whether the statute *excludes* a private law remedy".¹⁵²

[266] The starting point is to consider a public authority's functions and powers.¹⁵³ A statute may positively exclude liability by, for example, authorising the conduct at issue. It may also exclude liability because it is inconsistent with what the statute requires or empowers a public body to do. A duty is more likely to be imposed if it would buttress and support the legislative policy. It may be denied if it would cut across or discourage the performance of the statutory function.¹⁵⁴ The statutory context is therefore important.

¹⁴⁷ *Gorringe v Calderdale Metropolitan Borough Council* [2004] UKHL 15.

¹⁴⁸ *Robinson* at [33] per Lord Reed.

¹⁴⁹ At [55] per Elias CJ and Anderson J. The Court was unanimous on the result but differed in their reasons. The judgment of Elias CJ (joined by Anderson J) contained the minority reasoning but the difference between the majority and minority concerned was not about this statement of principle.

¹⁵⁰ *Todd on Torts* at 370.

¹⁵¹ *Gorringe v Calderdale Metropolitan Borough Council* [2004] UKHL 15 [*Gorringe*].

¹⁵² At [3].

¹⁵³ *The Grange* at [170] referring to *Fleming v Securities Commission* at 528 per Richardson J.

¹⁵⁴ *Todd on Torts* at 370.

[267] Although in principle a public body is liable in negligence in the same way as a private individual, there are special considerations. Todd puts it this way:¹⁵⁵

Public bodies frequently have wide-ranging duties and powers which can impact on the public at large in all kinds of ways. They cannot be open to action by all who might be harmed in some way by the negligent exercise or non-exercise of their statutory responsibilities. Rather ... any duty imposed by the courts should not trespass into a non-justiciable or political sphere, should not interfere with a public body's autonomy in deciding whether or how to act, should impose only a suitably proportionate burden of liability, should more readily protect those in vulnerable positions, and should operate coherently in relation to the statutory context, other common law principles and the legal system as a whole.

[268] What Professor Todd describes as trespassing into “a non-justiciable or political sphere” has sometimes been discussed in terms of a distinction between a policy (or planning) decision and an operational one.¹⁵⁶ The key point is whether the allegation of negligence is of a character that renders it unsuitable for judicial decision. In *Takaro Properties Ltd v Rowling*, the Privy Council put it this way:¹⁵⁷

They incline to the opinion, expressed in the literature, that this distinction [between policy and operational decisions] does not provide a touchstone of liability, but rather is expressive of the need to exclude altogether those cases in which the decision under attack is of such a kind that a question whether it has been made negligently is unsuitable for judicial resolution, of which notable examples are discretionary decisions on the allocation of scarce resources or the distribution of risks ... If this is right, classification of the relevant decision as a policy or planning decision in this sense may exclude liability; but a conclusion that it does not fall within that category does not, in their Lordships' opinion, mean that a duty of care will necessarily exist.

[269] More recently, in *Couch (No 1)* the Chief Justice (with Anderson J in agreement) considered it relevant to ask whether the alleged duty concerns acts or omissions by a public body exercising “high-level responsibilities”.¹⁵⁸ In such a situation a duty might be more readily precluded as a matter of implied legislative

¹⁵⁵ At 348-349.

¹⁵⁶ For example, in *Anns* at 754 Lord Wilberforce said: “Although this distinction between the policy area and operational area is convenient, and illuminating, it is probably a distinction of degree; many ‘operational’ powers or duties have in them some element of ‘discretion’. It can safely be said that the more ‘operational’ a power or duty may be, the easier it is to superimpose on it a common law duty of care.”

¹⁵⁷ *Takaro Properties Ltd v Rowling* [1988] AC 473, [1987] 2 NZLR 700 at 709 per Lord Keith of Kinkel.

¹⁵⁸ *Couch (No 1)* at [59] per Elias CJ (with Anderson J agreeing).

intent.¹⁵⁹ The case concerned alleged negligence by a probation officer who was ill-equipped for her role. It was unclear on the strike out application whether the probation officer had been managed inadequately as:¹⁶⁰

... a result of high policy assessment of priorities (which might be a consideration against a duty of care or its breach, depending on the view taken of the statutory obligation) rather than administrative blunders (which may raise no such concerns of policy or excuse).

[270] Canadian cases have found the policy/operations distinction important in deciding if a public body owes a duty of care. One example, relied on by the defendant in this case, is *George v Newfoundland and Labrador*.¹⁶¹ This concerned a claim for negligence against the provincial government by victims of motor vehicle accidents arising from collisions with moose on the island of Newfoundland. The moose population on the island had become “hyper-abundant” and there were many moose-related collisions.¹⁶² During the relevant period the province had adopted a strategy of reducing moose-vehicle collisions through increasing public awareness and targeted prevention strategies.¹⁶³ The plaintiffs contended that a duty of care was owed by the public officials to the travelling public to conduct a reasonable level of research when formulating policy advice to the executive on moose-vehicle collision mitigation.

[271] The Court found that no duty of care arose. The case was one where the scale and manner of the mitigation measures to be exercised was left to the discretion of the

¹⁵⁹ At [59]. The minority judgment contrasted the duty of care claimed against the Probation Service with the “target duties” referred to in *Gorringe* at [29]. That is, duties requiring the public body to do no more than exercise its powers in the manner it considers appropriate. The minority judgment notes the differences in views in other jurisdictions on this topic.

¹⁶⁰ At [12]. See also *Body Corporate 207624 v North Shore City Council* [2012] NZSC 83, [2013] 2 NZLR 297 [*Spencer on Byron*], a case concerning a council’s alleged negligence in inspecting a building. Elias CJ comments that the case was not one of those cases where the Court had to decide whether a duty to use available powers arose. The Chief Justice commented that those cases “can turn on questions of policy and priorities in spending which may make it inappropriate to recognise a duty of care which would transform the ability to avoid harm into an obligation to do so.” Examples of this were *Stovin v Wise* [1996] AC 923 (HL) and *Fleming v Securities Commission*.

¹⁶¹ *George v Newfoundland and Labrador* [2016] NLCA 24, 399 DLR (4th) 440.

¹⁶² Moose had been introduced to the island of Newfoundland in 1874-75. At the time relevant to the claim, there was approximately one moose for every five persons living on the island and 3.5 per cent of all vehicle accidents in the province were moose-vehicle collisions. The proceeding was commenced as a class action on behalf of victims of moose-vehicle collisions during the period from April 2001 to November 2011.

¹⁶³ For example: driver education, enhancing highway signage and increasing brush clearing.

government. No proximity could be shown between the government and individuals.¹⁶⁴ No private law duty arose to better mitigate the risk as that would conflict with the province's other duties. If there was a prima facie duty of care owed, it would be negated by policy reasons.¹⁶⁵ It was a non-justiciable policy decision by the government¹⁶⁶ and policy decisions, involving social, economic and political considerations, did not give rise to tort liability.¹⁶⁷ Negligent public policy-making was not a tort.¹⁶⁸

[272] Cases of this kind may therefore fail the requirement of proximity. The statute confers a discretion to be exercised for the benefit of the public generally. A duty to exercise that discretion in some manner may conflict with other duties. These cases also raise policy concerns of indeterminate liability and the risk that imposing a duty involves passing judgments on government expenditure that the court may not be best placed to make.¹⁶⁹ This latter point may overlap with and could also be considered when deciding whether a duty of care was breached.

[273] An example is provided by another Canadian case. In *Just Cory J*, discussing governmental inspections of aircraft, said:¹⁷⁰

¹⁶⁴ *George v Newfoundland and Labrador* at [130]. Proximity did not arise from the interactions between the province and the claimants as there had been no particular interactions other than being a motorist on the highway. If there was a duty, it was one owed to the public as a whole. Nor did proximity arise out of the statute. The claim was about the process of formulating policy rather than the negligent implementation of a highway maintenance practice (at [133]). The government's duty to maintain highways could not be interpreted as imposing a duty to expend unlimited funds upon eliminating any possibility of moose getting upon highways and creating risks to the travelling public.

¹⁶⁵ At [135]. The Court had to be mindful of imposing indeterminate liability and creating an insurance scheme not contemplated by the legislature.

¹⁶⁶ At [137]. The courts did not have the authority to require government to reduce annual expenditures on other social services. Annual budgeting was a discretionary authority assigned under a parliamentary democracy to the legislature and the executive. The correct interpretation of the statutory framework was that it assigned a discretion to be reasonably exercised, not by the courts but by the legislature and executive.

¹⁶⁷ At [154].

¹⁶⁸ At [161].

¹⁶⁹ A similar point is made in *Couch v Attorney-General (No 2) (on appeal from Hobson v Attorney-General)* [2010] NZSC 27, [2010] 3 NZLR 149 [*Couch No 2*], at [161] per Tipping J, in discussing whether subjective recklessness ought to be part of the test for exemplary damages, as follows: "The present case is said to involve so-called systemic negligence of this kind. In the case of governmental organisations there is a danger that such cases may become an examination of general governmental policies, priorities and funding decisions into which the legal system should be very reluctant to go. The remedy for issues of this kind is generally political rather than legal."

¹⁷⁰ *Just v British Columbia* [1989] 2 SCR 1228 at 1243 per Cory J. Cited in *George v Newfoundland and Labrador* at [124] per Barry JA.

Thus a decision either not to inspect at all or to reduce the number of inspections may be an unassailable policy decision ...

At a lower level, government aircraft inspectors checking on the quality of manufactured aircraft parts at a factory may make a policy decision to make a spot check of manufactured items throughout the day as opposed to checking every item manufactured in the course of one hour of the day. Such a choice as to how the inspection was to be undertaken could well be necessitated by the lack of both trained personnel and funds to provide such inspection personnel. In those circumstances the policy decision that a spot check inspection would be made could not be attacked.

[274] It would also be more difficult to establish a lack of care in decisions about the funding available for such inspections and policies as to how that funding is best allocated in implementing the duty.¹⁷¹

[275] This is also the rationale of *Cromane v Minister for Agriculture*, a decision of the Supreme Court of Ireland which is also relied on by the defendant.¹⁷² This case considered whether the State owed a duty of care to the owners of a mussel harvesting business and the purchasers of the mussels. The business was closed due to a European Commission directive. Pursuant to that directive only conservation work could be undertaken at the site and this applied to both existing businesses as well as future use. Approval was required and could be granted if the business did not adversely affect the integrity of the site.

[276] A majority of the Court considered that no duty of care was owed. Under the legislative framework, the State's duties were to the wider community in the protection of the environment. The State's most important duty was found in European law. Forty sites had been affected by the closure of non-conservation activity until they could be cleared through an appropriate assessment. How was the State to choose which of these 40 was to be given priority? The majority considered there was nothing in the legislation that provided a duty of care in favour of the respondents. It was concerned that a duty of care involving public decisions would involve the Court in

¹⁷¹ *Todd on Torts* at 374 makes the point that the funding and other resources which are available to meet the demands which are made upon the public body will be very relevant to whether any duty is breached (citing *Just v British Columbia*).

¹⁷² *Cromane v Minister for Agriculture, Fisheries & Food* [2016] IESC 6 [*Cromane*].

hearing “the views of experts at several removes from the pressures of government”.¹⁷³

It considered:¹⁷⁴

... The rationale for excluding the exercise of discretionary powers is that where the statutory framework places the decision making power in the context of a choice between action on a particular issue, through the expenditure of funds that may also be needed elsewhere, or in the context of a choice between the allocation of resources insufficient to cover all needs, it is both a matter of policy and administrative choice. Further, it is also the reposing of trust by the legislature in administration and not in the litigation process. In that regard, administration should not have to look to prospective second-guessing by the courts, as this would trammel the discretionary power conferred. Instead, in any area of governmental activity it would become possible to find an expert to say that a different policy might have enhanced any contended for benefit to litigants, or not taken same away and to construct, through operative negligence, a realm where a duty of care is inventively and artificially owed to all prospective beneficiaries of whatever allocation of resources may be made.

[277] The minority view regarded the case as one which lay well to the implementation or administrative (rather than the policy or discretion) end of the spectrum.¹⁷⁵ The Judge considered that a similar failure by a private individual in an analogous situation would be likely to lead to the Court imposing a duty of care and finding that individual negligent.¹⁷⁶ The minority judgment would have disallowed the relational economic loss claim from the purchasers of the business. They were not in any different position, as a matter of principle and as a matter of law, from any other downstream purchaser (for example, supermarkets who purchased mussels from the business) and “such downstream knock-on effect” did not meet the test of proximity.¹⁷⁷

[278] Whether described in terms of political versus operational decisions or decisions that are unsuitable for judicial resolution, there are no bright lines. Because

¹⁷³ At [29].

¹⁷⁴ At [29] per Charleton J.

¹⁷⁵ At [15.29] per Clarke J (with Laffoy J concurring).

¹⁷⁶ At [15.32].

¹⁷⁷ At [17.4].

of this, reliance on this distinction has its opponents. It is not favoured in the United Kingdom for example.¹⁷⁸ Professor Todd summarises the topic as follows:¹⁷⁹

Claims rarely fail on the grounds that they involve high level responsibilities, or are not justiciable, or are essentially political. Even so, asking this kind of question may sometimes be of value, and there is continuing support for this kind of inquiry. But duty problems involving public bodies are far more likely to be resolved on other bases ...

[279] Public bodies are vested with wide-ranging responsibilities of a significant magnitude and complexity for the public good. This means sometimes there may be difficulties in applying private duty principles to public body powers. Some governmental obligations are relatively easily analogised to well-established case categories of common law obligations, while others are not.¹⁸⁰ A particular issue is whether a private duty of care to prevent harm caused by another person or another thing can arise from a statutory duty or power to prevent harm. Private individuals or bodies have no such duties. Nevertheless, by analogy with omission cases involving private individuals, factors such as control, assumption of responsibility and vulnerability are important in considering when a public body will come under a duty to prevent harm caused by someone else. This is discussed by Professor Todd as follows:¹⁸¹

In *Michael v Chief Constable of South Wales Police* Lord Toulson said that it did not follow from the setting up of a protective system from public resources that if it failed to achieve its purpose, through organisational defects or fault on the part of an individual, the public at large should bear the additional burden of compensating a victim for harm caused by the actions of a third party for whose behaviour the state is not responsible. Accordingly, and consistently with the cases involving private defendants, in cases where the complaint is of a failure to prevent harm done by another person there needs to be close control over, or a specific assumption of responsibility in relation to, the person who has caused the harm. In addition, in all cases it is necessary to consider the proximity of the connection or relationship between the defendant public body and the plaintiff. There needs to be an assumed responsibility which brings about a special, proximate, relationship between

¹⁷⁸ See, for example, Lord Hoffman's discussion in *Stovin v Wise* of the Canadian cases relying on the policy/operational distinction at 955 and Lord Reed in *Robinson* at [38], which described *Anns* as having found a duty of care to prevent the harm caused by another party's conduct in the absence of any special circumstances such as an assumption of responsibility and "add[ing] to the confusion by importing public law concepts, and the American distinction between policy and operational decisions, into questions concerning duties arising under the law of obligations."

¹⁷⁹ *Todd on Torts* at 353.

¹⁸⁰ See C Curran, D Knight, G McLay "Liability of Public Authorities" (New Zealand Law Society Seminar Paper, June 2009) at 15 for example.

¹⁸¹ *Todd on Torts* at 354.

the defendant body and the person affected by its failure to act. ... Further influential considerations, not confined to omissions cases, include whether the plaintiff was vulnerable to harm, and whether a duty could operate coherently in the particular statutory context.

[280] This is also discussed by Lord Reed in *Robinson*:¹⁸²

... there are certain circumstances in which public authorities, like private individuals and bodies, can come under a duty to prevent the occurrence of harm ... In the absence of such circumstances, however, public authorities generally owe no duty of care towards individuals to confer a benefit upon them by protecting them from harm, any more than would a private individual or body ...

That is so, notwithstanding that a public authority may have statutory powers or duties enabling or requiring it to prevent the harm in question ... The position is different if, on its true construction, the statutory power or duty is intended to give rise to a duty to individual members of the public which is enforceable by means of a private right of action. If, however, the statute does not create a private right of action, then “it would be, to say the least, unusual if the mere existence of the statutory duty [or ... a statutory power] could generate a common law duty of care” ...

... public authorities, like private individuals and bodies, generally owe no duty of care towards individuals to prevent them from being harmed by the conduct of a third party ... There are however circumstances where such a duty may be owed ... They include circumstances where the public authority has created a danger of harm which would not otherwise have existed, or has assumed a responsibility for an individual’s safety on which the individual has relied.

...

... liability is generally imposed for causing harm rather than for failing to prevent harm caused by other people or by natural causes. It is also consistent with that characteristic that the exceptions to the general non-imposition of liability for omissions include situations where there has been a voluntary assumption of responsibility to prevent harm (situations which have sometimes been described as being close or akin to contract), situations where a person has assumed a status which carries with it a responsibility to prevent harm, such as being a parent or standing in loco parentis, and situations where the omission arises in the context of the defendant’s having acted so as to create or increase a risk of harm.

[281] Lord Reed considered the principle that there was generally no liability for omissions explained the rationale of *Hill* (where the police did not owe a duty of care for failing to arrest a murderer before a potential future victim was killed) and *Michael* (where the police did not owe a duty for failing to respond to an emergency call in

¹⁸² *Robinson* at [35]-[37] and [69].

time to save the caller from the attack).¹⁸³ *Dorset Yacht* was within the exceptions to the omissions principle: the public authority owed a duty of care to protect an individual from a danger of injury which it had created.¹⁸⁴

[282] Lord Reed agreed with the earlier observations of Lord Hoffmann in *Stovin v Wise* as to the distinction between acts or omissions.¹⁸⁵ To hold a defendant liable for an act, rather than an omission, it was necessary to be able to say the damage was caused by something which the defendant did. So, if an accident is caused by a driver of a car driving at 50 miles per hour (an act) who fails to apply the brakes (omission) and collides with another, the damage was caused by a positive act (driving at 50 miles per hour).¹⁸⁶ In *Robinson* the case was one of action. The plaintiff was injured when the police were carrying out positive acts (arresting someone), not one of failing to protect the plaintiff against the risk of injury.¹⁸⁷

[283] Lord Hughes was unconvinced by this reasoning. He considered the great majority of cases could be analysed in terms of both omission and commission. He considered the omissions principle did not provide the complete answer to when a duty was not owed to individuals in police investigations. Rather, policy considerations meant that the greater public good required the absence of any duty of care.¹⁸⁸ He agreed, however, that the present case was one of a positive act, namely arresting a suspect, which directly caused physical harm and it did not matter that the suspect was the first to collide with the plaintiff.

[284] It can be seen that negligence in the context of statutory duties and powers is a difficult and complex subject. It was described by Lord Steyn in *Gorringe* as follows:¹⁸⁹

¹⁸³ At [72] citing *Hill v Chief Constable of West Yorkshire Police* [1989] AC 53 (HL) [*Hill*]; and *Michael v Chief Constable of South Wales Police* [2015] UKSC 2, [2015] 2 WLR 343 [*Michael*]. In *Hill*, the House of Lords struck out a claim against the police by the mother of one of the victims of the Yorkshire Ripper. The House of Lords considered the case involved a victim who the police had no reason to believe was at a special or particular risk other than being a member of a rather large potential group, that of women in Northern England.

¹⁸⁴ *Robinson* at [70] per Lord Reed.

¹⁸⁵ *Stovin v Wise* at 945.

¹⁸⁶ *Robinson* at [70].

¹⁸⁷ At [73].

¹⁸⁸ *Robinson* at [118].

¹⁸⁹ *Gorringe* at [2].

... This is a subject of great complexity and very much an evolving area of the law. No single decision is capable of providing a comprehensive analysis. It is a subject on which an intense focus on the particular facts and on the particular statutory background, seen in the context of the contours of our social welfare state, is necessary. On the one hand the courts must not contribute to the creation of a society bent on litigation, which is premised on the illusion that for every misfortune there is a remedy. On the other hand, there are cases where the courts must recognise on principled grounds the compelling demands of corrective justice or what has been called “the rule of public policy which has first claim on the loyalty of the law: that wrongs should be remedied” Sometimes cases may not obviously fall in one category or the other. Truly difficult cases arise.

[285] It is helpful to consider examples. They may provide some guidance by analogy in this difficult area.

New Zealand examples

[286] The main Supreme Court decisions involving public bodies are *Couch (No 1)* and the building cases (*Sunset Terraces*, *Spencer on Byron*, and *The Grange*).¹⁹⁰

[287] In *Couch (No 1)* the Supreme Court was unanimous that it was reasonably arguable, on a strike out application, that a duty of care arose by the Probation Service to a person physically harmed by a parolee under the Service’s supervision. The statute imposed a duty on probation officers to supervise parolees “to ensure that the conditions of ... release are complied with”.¹⁹¹ This was a duty owed to the public generally. The Court was agreed that a private law duty of care did not conflict with the statutory duty.¹⁹²

[288] The lead judgment (given by Tipping J and joined by Blanchard and McGrath JJ) noted:¹⁹³

The law has traditionally been cautious about imposing a duty of care in cases of omission as opposed to commission; in cases where a public authority is performing a role for the benefit of the community as a whole; and in cases where it is the actions of a third party rather than those of the defendant that are the immediate cause of the loss or harm suffered by the plaintiff. All three

¹⁹⁰ *North Shore City Council v Body Corporate 188529 [Sunset Terraces]* [2010] NZSC 158, [2011] 2 NZLR 289 [*Sunset Terraces*].

¹⁹¹ Criminal Justice Act 1985, s 125.

¹⁹² *Couch (No 1)* at [58] per Elias CJ (Anderson J agreeing) and at [111] per Tipping J (Blanchard and McGrath JJ agreeing).

¹⁹³ At [80].

dimensions feature in the present case, but it is the third which is the most significant on the issue of proximity.

[289] Where the immediate cause of the harm was the voluntary and independent conduct of a third person, it was necessary to consider two relationships – that between the defendant and the third party, and that between the defendant and the plaintiff.¹⁹⁴ As to the first of these, it was necessary to show that the defendant had sufficient power and the ability to control the third person in a way which would have prevented the harm suffered.¹⁹⁵ It was also necessary that there be sufficient proximity between the defendant and the plaintiff.¹⁹⁶ This required the plaintiff to demonstrate that:¹⁹⁷

... either as an individual or as a member of an identifiable and sufficiently delineated class, she was or should have been known by the defendants to be the subject of a distinct and special risk of suffering harm of the kind she sustained at the hands of [the third party]. The necessary risk must be distinct in the sense of being dearly apparent, and special in the sense that the plaintiff's individual circumstances, or her membership of the necessary class rendered her particularly vulnerable to suffering harm of the relevant kind from [the third party].

[290] This was arguable on the pleaded facts because the defendant (the Probation Service) knew of dangerous features of the third party's (a parolee) previous conduct. He was a violent offender (committing gratuitous violence in the course of a robbery) with an alcohol addiction. He was assessed as having a high risk of reoffending and requiring close supervision, especially around alcohol. He was able to find out about the RSA's security systems while he was working there such that the RSA was a predictable target of any reoffending. This meant the plaintiff was particularly vulnerable, as an employee at a local RSA (a business with alcohol and cash) where the Probation Service had permitted the third party to work.¹⁹⁸

[291] As to the building cases, the divergence from the United Kingdom approach began with *Invercargill City Council v Hamlin*, where the Court of Appeal declined to

¹⁹⁴ The majority judgment in *Michael* at [99] agreed with Tipping J's approach but left open the question of what the particular formulation of the special relationship required for a case where the issue arose directly.

¹⁹⁵ *Couch (No 1)* at [84] per Tipping J.

¹⁹⁶ At [85].

¹⁹⁷ At [112].

¹⁹⁸ At [124]. The Court was not unanimous on this approach to proximity. Elias CJ and Anderson J consider proximity could arise from the nature of the statutory obligations (that is, because the public body is entrusted with responsibilities to protect the public) together with the Probation Service's knowledge of the risk and the means available to it to prevent it.

reconsider the liability of local authorities undertaking building inspections following the change in *Murphy*. The Court of Appeal's decision was upheld by the Privy Council as a policy choice which the New Zealand judges were best placed to make in the context of New Zealand conditions.¹⁹⁹

[292] Around fourteen years later, in *Sunset Terraces*, the Supreme Court was asked to reconsider *Hamlin*. This case arose in the context of the “leaky building disaster” (as it was described in *Spencer on Byron*) arising from the wave of New Zealand buildings constructed with monolithic cladding which were experiencing weathertight issues. *Sunset Terraces* was a unit title development comprising 21 townhouses. The townhouses were occupied by a mixture of owners and tenants. The claim was brought against the Council for negligence in its inspection of the building prior to its completion. The Supreme Court declined to reconsider *Hamlin*. It also declined to restrict its scope to stand-alone houses occupied by owners.

[293] In reaching its views, the Court discussed the case of *Dutton*, decided in the United Kingdom, which was the authority that had underpinned the *Hamlin* line of authority.²⁰⁰ In that case the Judge had questioned, in response to a floodgates argument, whether holding the Council liable for the economic loss suffered from negligent building inspections would lead to a flood of cases which neither councils nor the courts would be able to handle. The Judge considered this was unlikely because a plaintiff would rarely allege and be able to prove a case against the Council. The Court in *Sunset Terraces* noted this forecast of the future had not been borne out in New Zealand.²⁰¹

[294] Nevertheless the Court considered that “floodgates” was not a reason to confine *Hamlin* to its circumstances (that is, stand-alone houses occupied by

¹⁹⁹ Those conditions included that most people owned homes built for them by small-scale builders, there had been extensive government support for low cost housing, it had not been the practice for reports by engineers and surveyors to be commissioned by new house buyers, standard bylaws considered comfort and standards of workmanship, the position had not been altered when Parliament enacted the Building Act 1991, and any change to the law was one for Parliament because of the likely community and economic impact of changing the law.

²⁰⁰ *Dutton v Bognor Regis Urban District Council* [1972] 1 QB 373 (CA).

²⁰¹ *Sunset Terraces* at [36] per Tipping J. This perhaps illustrates the potential ineffectiveness of relying on the other elements of negligence as controls on the floodgates argument.

owners).²⁰² It considered that, to confine *Hamlin* in this way, would be inconsistent with the rationale for the duty. That rationale was said to be based on the control which councils have over building projects and the reliance people place on them to exercise with reasonable skill and care their powers of inspection of features which will be covered up.²⁰³ The duty was to protect the interests people have in their homes, a duty which should extend to all homes, whatever form the home takes.²⁰⁴

[295] Nor, as it was later determined in *Spencer on Byron*, was the *Hamlin* duty confined to residential buildings. This case concerned a multi-storied, multi-unit building, containing residential apartments, individually-owned hotel rooms, and facilities for hotel guests. The building suffered weathertightness issues and a claim was made against the Council for negligence in issuing the building consents, carrying out inspections and approving the development. A majority of the Supreme Court held that a duty was owed to all the owners of the units, regardless of whether the units were used for residential or commercial use.²⁰⁵

[296] In reaching this view Chambers J, who gave one of the judgments contributing to the majority view, considered the building code was essentially designed to bring about safe and healthy buildings (not just residential ones).²⁰⁶ He considered the rationale of *Hamlin* and *Sunset Terraces* applied to all buildings and the question was whether there were policy reasons to restrict the duty of care to residential homes. He determined there were not. In his view, most of the policy reasons were the same as those examined and rejected in *Sunset Terraces*. He concluded that it could not be said that commercial building owners were as a class less vulnerable and reliant on the Council than residential building owners.

[297] A floodgates submission was advanced. It was said that widening the duty to embrace commercial properties would result in the transfer of hundreds of millions, if

²⁰² At [36].

²⁰³ At [48].

²⁰⁴ At [49].

²⁰⁵ In *Southland Indoor Leisure Centre Charitable Trust v Invercargill City Council* [2017] NZSC 190, [2018] 1 NZLR 278 [*Southland Indoor Leisure Centre*], *Spencer on Byron* was applied to find a duty of care was owed by the Council to a Trust which had built a stadium providing sporting and recreational facilities.

²⁰⁶ *Spencer on Byron* at [171].

not billions, of dollars of losses from commercial building owners to ratepayers. This was rejected by Chambers J as “loaded with assumptions.”²⁰⁷ The Judge considered the financial backing of councils was greater than most commercial building owners, they might also have insurance, they could generate income from carrying out inspections, and they could increase rates. And everyone who uses buildings benefits from safe and healthy buildings.²⁰⁸

[298] One of the arguments advanced against the duty was that it would make councils excessively cautious. Chambers J regarded this as really an argument against the imposition of any duty of care in the building area.²⁰⁹ He noted that this seemed not to have occurred with “the leaky building disaster” which had beset New Zealand. Tipping J considered that if a duty of care would lead to excessive caution on the part of building inspectors that would be consistent with the fundamental policy goal of the Building Act to ensure that all buildings are code compliant. In any event he did not regard the risk as serious, commenting that *Hamlin* “certainly did not lead to excessive caution on the part of building inspectors. If anything, the reverse seems to have been the case.”²¹⁰

[299] William Young J dissented. There are, however, general comments on policy and economic loss which are potentially helpful to considering whether a duty of care arises in this case. As to economic loss, William Young J comments:²¹¹

It is right that everyone should to take reasonable care not to damage the person or property of others. This is why Lord Atkin’s speech in *Donoghue v Stevenson* makes perfect sense when the foreseeable loss involves personal injury or damage to property. That speech, however, is not so easily applicable to economic loss. Indeed, it makes no sense to talk of a general obligation to take reasonable care not to inflict financial loss on others. ...

[300] As to policy considerations, where they are about whether, from the viewpoint of society as a whole, a duty of care would be better than no such duty, these involve

²⁰⁷ At [203].

²⁰⁸ At [203].

²⁰⁹ At [205].

²¹⁰ At [48].

²¹¹ At [241].

value judgments that are difficult for Judges to make. William Young J elaborated on this point:²¹²

... the courts remain badly placed to determine policy issues. Such issues tend to lie outside core judicial competencies. As well, the rules as to the determination of civil litigation do not provide for the sort of policy-formation exercises which are customary in other areas of public life, for instance the commissioning of empirical research, consultation with stakeholders, the publication of exposure drafts and the like. As well, available material bearing closely on the policy considerations in issue in a case may be thin on the ground. By way of illustration of this, there is – at least to my knowledge – very little published research which analyses the responses of public authorities to the imposition of novel duties of care. Unsurprisingly therefore, in deciding whether the imposition of a duty of care will be a “good thing” (for instance as incentivising better performance of public functions) or a “bad thing” (as encouraging overly defensive official conduct and wasteful litigation), judges often rely on what can be no more than hunches. Such hunches may be right, particularly where they relate to issues closely associated with the way in which civil litigation is conducted and its expense. But in relation to other issues, such hunches are quite likely to be wrong, a proposition which I think may be exemplified by defective building cases, as I will indicate shortly.

[301] The Judge considered a duty of care was not owed by the Council in relation to commercial buildings and the case was not within existing authority. He was concerned that imposing a duty of care could cut across contractual allocation of responsibility and risk. He considered a building owner was primarily responsible for compliance with the Building Act, and it may be that the most efficient method of avoiding losses associated with defective buildings is to incentivise building owners to use competent and insured buildings, engineers and architects.²¹³ He was concerned at the potential for serious adverse consequences if the Council had to shoulder the burden of these claims. He considered that losses associated with defects in the construction of commercial buildings were business or investment losses and such losses were ordinarily to be borne by the investor rather than spread amongst the community.²¹⁴

²¹² At [237].

²¹³ At [302]-[305].

²¹⁴ *Todd on Torts* discusses the merits or otherwise of a residential/commercial distinction at 323-326. His discussion includes the following points: there is a public interest in discouraging the putting up of defective buildings of whatever kind and tort law can respond by giving a remedy; there are difficulties with distinguishing between commercial and residential use purchasers; underlying these decisions are the enormous scale of the leaky building problem and the difficulty of deciding how best to deal with the problem; the leaky building problem began in the late 1990s and was fully recognised by the early 2000s and building practices have since changed; and the Law Commission has considered whether there should be a change to the rule of proportionate liability,

[302] Although the duty of care owed by a council has been reaffirmed and extended in the line of cases just discussed, it has not extended to the Building Industry Authority (the BIA). This was decided in *The Grange*. The Council claimed the BIA owed a duty of care to it when it produced a report to the Minister and copied it to the Council. The report did not alert the Council of problems with buildings using monolithic cladding over untreated timber. Owners of a building approved by the Council subsequently had weathertightness issues, suing the Council which in turn sued the BIA.

[303] The Supreme Court held that the claim did not disclose a reasonable cause of action.²¹⁵ The Council's claim passed the "screening test" of reasonable foreseeability of harm. As to proximity, the starting point was the statute. The statute did not expressly impose a duty to report to the Council. It was for the BIA to choose whether to carry out a review of a territorial authority. The report was one for the Minister. The BIA was a small body with a limited role. It did not have an ability to exercise control over the day-to-day operations of the Council, it was separated from the events which gave rise to the loss suffered by the Council, the Council had the ability to manage its building control system, the Council's loss resulted from its own negligent failure to do so, and the immediate cause of the loss was third parties. Proximity did not arise from the statute.²¹⁶ Nor, as the Court went on to explain, did it arise on the basis of voluntarily assumed responsibility to the Council.

[304] The Council also claimed the BIA owed a duty of care to the building owners. The majority considered the case for proximity as between the BIA and the building owners was even weaker. This was especially because of the BIA's separation from and inability to control the day to day administration of the consenting and inspection processes. The BIA had neither a responsibility to inspect a property nor any power of inspection in relation to an individual building. The building levies were paid to

which would ease the economic consequences for the Council, but recommended against it. Any such change would mean the majority of the loss would fall on the building owner because frequently the Council is the only solvent defendant remaining.

²¹⁵ The Chief Justice delivered a dissenting judgment.

²¹⁶ *The Grange* at [185]-[186]: The absence of any immunity for the BIA and the existence of liability in relation to some actions did not indicate that it was intended to have any wider liability. The statute neither expressly nor impliedly placed upon the BIA a duty of care when advising the Council concerning its building control systems by way of a report following its review to protect the Council from the consequences of its own neglect.

enable the BIA to perform its functions under the Act. Those functions did not include administration of the Council's code. There could therefore be no general reliance by the builders on this.²¹⁷

[305] Some points arising from these New Zealand examples are:

- (a) Claims for foreseeable physical injury (to person or property) are less problematic than claims for economic loss. In the latter there are boundary and allocation issues.
- (b) The *Hamlin* duty, regarded as a claim for economic loss, has incrementally expanded from the stand-alone residential housing basis. These building cases are based on the control the Council is able to exert on the interests people have in the health and safety of their homes and other places they occupy. Distributive justice issues – the Council is able to bear and spread the loss – underlie the duty.
- (c) Duties of care require special attention where the harm is not directly caused by the defendant. There must be some control over the risk and a relationship of proximity with the plaintiffs.
- (d) The requirement of proximity is an important control on indeterminate liability (that is, floodgates concerns). The assessment of proximity may consider a range of factors (control, reliance and vulnerability may feature). Ultimately, however, it is a judgement on a sufficient connection between the plaintiff and defendant and on what is a fair, just and reasonable balance between the plaintiff's interest for compensation and the defendant's interest in protection from undue burden.
- (e) Predictions about the impact of finding a duty of care are difficult and can be wrong. The proximity assessment is likely to be more controlling than external policy considerations.

²¹⁷ At [203].

Other biosecurity examples

[306] As noted, New Zealand courts have not previously been presented with a case concerning an alleged common law duty of care regarding biosecurity. However cases in other Commonwealth jurisdictions have arisen. Mention has already been made of *Weller & Co* (foot and mouth disease), *D Pride* (foot and mouth disease) and *Perre* (potato seed blight). Some other cases also featured in the submissions in this case.

[307] One of the cases relied on by the defendant is *Graham Barclay Oysters*, a decision of the High Court of Australia concerning whether the state and local governments were liable for failing to prevent pollution in a lake that led to some of the plaintiffs becoming sick from eating oysters.²¹⁸ The Court held they were not. While there were broad powers to protect the general community, of which those affected by the polluted oysters were part, the Government did not have a duty of care to protect a general population through exercising regulation or enforcement powers. As it was said by Gleeson CJ:²¹⁹

The claims against the State and the Council are based on non-feasance. Expressed in broad terms, they are that the State government, could and should have done more to prevent the outbreak of [the virus in the oysters]. The potential political content of that statement is obvious. ... Accepting that local government authorities, and State governments, have responsibilities for public health and safety, those responsibilities are owed to the public.

[308] The case contains some discussion of when a public authority may come under a duty of care, reflecting similar points to those discussed in *Robinson*. McHugh J said:²²⁰

Ordinarily, the common law does not impose a duty of care on a person to protect another from the risk of harm unless that person has created the risk. And public authorities are in no different position. A public authority has no duty to take reasonable care to protect other persons merely because the legislature has invested it with a power whose exercise could prevent harm to those persons. Thus, in most cases, a public authority will not be in breach of a common law duty by failing to exercise a discretionary power that is vested in it for the benefit of the general public. But if the authority has used its powers to intervene in a field of activity and increased the risk of harm to persons, it will ordinarily come under a duty of care. So also, if it knows or ought to know that a member of the public relies on it to exercise its power to

²¹⁸ *Graham Barclay Oysters Pty Ltd v Ryan* [2002] HCA 54 [*Graham Barclay Oysters*].

²¹⁹ At [8].

²²⁰ At [81].

protect his or her interests, the common law may impose a duty of care on the authority. If the authority comes under a duty of care, the failure of the authority to exercise a discretionary statutory power may give rise to a breach of the common law of duty of care. But subject to these exceptions, ordinarily the common law will not impose an affirmative duty of care on an authority which would have the result that a failure to exercise a statutory power constitutes a breach of that duty.

[309] A second case relied on by the defendant is *Regent Holdings v Victoria*.²²¹ The plaintiffs were a group involved in the commercial harvesting of wild abalone which suffered economic losses caused by an escape of a virus from an abalone farm. They alleged negligence against (relevantly) the state government personnel in relation to the non-exercise of powers under the Livestock Disease Control Act 1994 (Vic).²²² The contention was that the government had caused their loss by failing to take steps to cause the culling of stock and the taking of decontamination measures at the farm.

[310] The Court held the state government did not owe a private law duty of care. This was for a number of reasons: the indeterminacy in the class of people whose economic interest might be affected;²²³ recognising a duty of care created the potential for conflict with the duties that would be owed to farmers;²²⁴ the potential liability (for example one plaintiff claimed A\$8.2m) would be disproportionate to any fault that might be attributed to a preference of one group over another (i.e., as between the farmer group and the wild harvester group);²²⁵ the relevant statutory powers were of a “quasi-legislative nature” – that is, the powers of management involved were orders having the force of law, reinforced by criminal sanctions;²²⁶ and, while the plaintiffs were vulnerable, the farm rather than government personnel created the risk, and government did not exercise any direct control over the farm (it was the farmers who could take steps to eradicate the virus or the disease or at least to stop its spread).²²⁷

²²¹ *Regent Holdings v Victoria* [2013] VSC 601.

²²² The plaintiffs were comprised of: divers nominated under an Abalone Fishery Access Licence; holders of such licences; abalone receivers; being people permitted to receive or store wild abalone pursuant to a Fish Receivers or Storers (Abalone) Licence; holders of quota units in Abalone Fishery Access Licences; and holders of legal or equitable rights to the economic benefit of such licences, quota units and/or nominations (including those with a registered financial interest, those assigned a benefit by way of contract, and beneficiaries of trusts where a quota is held on trust).

²²³ At [224] per Beach JA.

²²⁴ At [223].

²²⁵ At [225].

²²⁶ At [226]-[228].

²²⁷ At [229]-[230].

[311] A third case relied on by the defendant is *Eliopoulos Estate v Ontario (Minister of Health and Long-Term Care)*.²²⁸ This case concerned a man who died after becoming infected with a mosquito-borne disease. His estate brought a claim against the provincial government contending it should have done more to prevent the spread of the virus. About 40 other Ontario residents who contracted the virus brought similar claims. The Court of Appeal for Ontario held that the provincial government did not owe a common law duty of care to the individuals.

[312] The Court reviewed the discretionary powers available to the Government. They were general powers available if the Minister chose to exercise them in the general public interest. A general public law duty of this nature did not give rise to a private law duty in negligence.²²⁹ The Court said:²³⁰

This case is concerned with a general risk faced by all members of the public and a public authority mandated to promote and protect the health of everyone located in its jurisdiction. The risk of contracting a disease that might have been prevented by public health authorities is a risk that is faced by the public at large. It is a much more generalized risk than the type faced by mortgage investors or clients of lawyers.

[313] These three examples are classic omission cases in the context of wide discretionary powers exercisable for the benefit of the general public. The public bodies have not created or increased the risk of harm or assumed responsibility so as to bring about a special, proximate, relationship between the public body and the person affected by its failure to act. In these cases there is no sufficient connection between the public body and any particular member or group of the public. Concerns about justiciability, and indeterminate and disproportionate liability, are paramount.

[314] The plaintiffs refer to three biosecurity cases, in addition to *Perre* discussed above, where plaintiffs have had more success. These are all decisions from Canada. In these cases the Canadian courts have not been reluctant to find a duty of care despite

²²⁸ *Eliopoulos Estate v Ontario (Minister of Health and Long-Term Care)* (2006) 276 DLR (4th) 411 (ONCA) [*Eliopoulos*].

²²⁹ At [17].

²³⁰ At [20]. The Court also considered at [22] whether a duty of care was triggered on the alleged basis that the government had put in place a plan and their negligence was in failing to implement that plan. The Court rejected this. If the plan created operational duties (which the Court doubted), they were duties on local authorities and the health boards (not the government). Further the pleadings essentially rested on failing to adopt adequate policies, rather than failing to implement the plan in a non-negligent manner.

the quite large sums of damages claimed. Control, general reliance and vulnerability have featured. The first of these is *Givskud v Kavanaugh*.²³¹ The claim arose out of an outbreak of bacterial ring rot which destroyed potato crops. Seed potato growers, who suffered losses because they had purchased infected seeds, brought a claim against both the seller of the infected seed and the Government.

[315] The relevant legislation provided for a seed potato certification programme. A central feature of this was for all seed potato operations to be visually inspected by inspectors to determine whether the growing crop met requirements. All grades of seed were required to be free from symptoms of bacterial ring rot and if the bacteria was present, certification of the crop was refused. The seed growers paid a prescribed fee for field inspections. There was no regulatory requirement for laboratory testing of seed potatoes. However laboratory testing had been a part of the certification process for a long time and was part of the Government's policy.

[316] The claim against the government agency was for vicarious liability for the actions of their inspector. Before the outbreak he had been asked by one of the plaintiffs to test the seeds of the seed seller. He had declined to do so. This testing would have protected all the other seed potato growers who were plaintiffs.

[317] This was a case of property damage and consequential economic loss. The Judge considered this meant that the general reliance placed by all the seed growers on the inspectors and the Government was sufficient – specific reliance was not necessary. All the seed growers gave evidence that one of the two main factors they considered when buying seed potatoes from other growers was the Government's certification of the seed. The evidence established also that the seed potato growers had no means or ability on their own to detect latent bacterial ring rot in their seed. This was a further factor that explained their reliance and dependence on the certification system and lab testing service provided by the Government.

[318] In finding a duty of care was owed, the Judge found there was proximity.²³²

²³¹ *Givskud v Kavanaugh* [1994] Carswell NB 75 (6 April 1994) [*Givskud*].

²³² At [47].

... On the one hand, [the inspector] administering programs and services so essential to the commercial affairs of the growers and on the other, the seed growers relying to a great extent on the certification program and lab testing ability of [the Government] as an effective means of keeping [the bacterial rot] out of the system. Although the plaintiffs testified to the importance of the standard farming and sanitation practices as a precautionary measure against [the bacteria], all acknowledged the risk of contamination by [the bacteria] despite their best efforts; hence their reliance and dependence on the lab testing ability of [the Government] which, incidentally, was not easily available elsewhere.

[319] The Crown’s vicarious liability for the inspector’s negligence was not excluded under the governing legislation or any other relevant legislation.

[320] The next case is *Sauer v The Attorney-General of Canada*.²³³ This case arose when a cow in Alberta was diagnosed with “mad cow disease” in 2003. As a consequence, the borders to the United States, Mexico and Japan were immediately closed to Canadian cattle and beef products with “catastrophic economic consequences for the commercial cattle industry in Canada”.²³⁴ An Ontario cattle farmer commenced a proposed class action on behalf of commercial cattle farmers in seven provinces against the Government of Canada (and others).

[321] The cow from Alberta was believed to have been infected through ruminants in cattle feed. The claim alleged the government had negligently designed and promulgated a 1990 regulation which permitted ruminants in cattle feed despite other measures implemented following the mad cow disease outbreak in the United Kingdom. In April 1996 the World Health Organisation issued a recommendation that all countries should ban the use of ruminant tissues in cattle feed. In August 1997 Canada enacted a regulation which prohibited ruminant feed. The claim against the Government also alleged negligence in failing to impose this ban by regulation prior to 1997.

[322] The Government applied to strike out the claim. The decision at first instance declining to do so was upheld on appeal to the Court of Appeal for Ontario.²³⁵ The

²³³ *Sauer v The Attorney-General of Canada (on behalf of the Her Majesty as represented by the Minister of Agriculture)* (2007) ONCA 454.

²³⁴ At [1].

²³⁵ The first instance decision of Regional Senior Justice Winkler: *Sauer v The Attorney-General of Canada (on behalf of the Her Majesty as represented by the Minister of Agriculture)* [2006] 79 OR (3d) 19.

Government contended that the claim attacked its legislative decisions (one to regulate in a certain way, and one not to regulate until a certain date). The Court considered it was not plain and obvious that the claims would fail. The requirement of foreseeability was met. The pleaded basis for proximity was the many public representations by the Government that it regulated the content of cattle feed to protect commercial cattle farmers. This was said to show that the Government was acting with their interests in mind rather than the broad public interest. It was also considered arguable the Government's decisions were operational, rather than policy decisions.

[323] The third case is *Adams v Borrel*.²³⁶ The claimants were involved in farming and marketing seed potatoes. They represented somewhere between 176 and 246 farmers who sought damages from the federal Government for allegedly negligent mishandling of a potato virus that originated with seed potatoes grown and marketed from a particular island. Collectively the farmers sought an amount exceeding \$75 million. Once the virus was found as present, the Government decided to completely eradicate it and to compensate the affected farmers. Eradication meant that the potatoes were disposed of, with farmers receiving compensation in the vicinity of \$12 million. The claimant farmers were amongst those who were compensated. The findings at trial did not cover what kind of loss these payments covered.

[324] The trial Judge had dismissed the claim. The appeal was allowed and remitted to the trial Judge for a determination on damages. The New Brunswick Court of Appeal considered there was an analogy with cases holding a government authority liable in carrying out inspections regarding road maintenance or compliance with building by-laws. The purpose of the legislative scheme was to protect the agricultural sector of the economy by protecting the interests of farmers. There were no policy reasons to negate the duty. The potential plaintiffs were a limited class (namely potato farmers) and the Government had established a body to look after their interests in addressing the problem of pests in the agriculture sector.

[325] On appeal, the Court considered it was through the legal concept of "proximate cause" that the courts were able to limit the extent of liability. It said:²³⁷

²³⁶ *Adams v Borrel* 2008 NBCA 62.

²³⁷ At [67] per Robertson J.

It is clear that but for the negligence of [the Government], the appellant farmers would not have purchased and planted infested seed potatoes from P.E.I. Accordingly the appellants are entitled to damages tied to the 1990 crop year. However, the appellant farmers also claim that but for that negligence none of what unfolded in regard to the 1991 and 1992 crop years would have arisen either and, thus, they are entitled to damages suffered throughout the entire period in question. Whether or not the appellant farmers are entitled to damages tied to the subsequent crop years brings into play the complex notion of causation, which in turn breaks down into two subcomponents: “cause-in-fact” and “cause-in-law”. The latter term is often referred to as the issue of “proximate cause” or “remoteness”. The question to be addressed is whether the harm is too unrelated to the wrongful conduct to hold the defendant liable ...

[326] The Court considered particular categories of pure economic loss resulting from the border closures and its consequences were recoverable pursuant to another Canadian decision which had allowed such claims.

This case: the statutory context

[327] The statutory context is discussed in the “Factual Background” section of this judgment. However, because it is important to whether a duty of care is owed, the key features are set out again in this section.

The Biosecurity Act 1993

[328] MAF personnel were acting under the Biosecurity Act when:

- (a) issuing the permit to Kiwi Pollen to import pollen, pursuant to which the anthers from China came into New Zealand; and
- (b) clearing the consignment of anthers at the border.

[329] It is therefore necessary to consider MAF’s powers and responsibilities under this Act. The starting point is the purpose of the Act. There is no general purpose provision for the Act but its long title is as follows: “An act to restate and reform the law relating to the exclusion, eradication, and effective management of pests and unwanted organisms.”

[330] Exclusion, eradication and effective management match the scope of the Act. The Act contains pre-border, border, and post-border measures. Pre-border and border measures are about seeking to exclude unwanted organisms. Post-border measures are about eradicating and effectively managing unwanted organisms once they have arrived. The post-border measures are therefore predicated on the assumption that pre-border and border measures cannot achieve complete exclusion.

[331] For present purposes, Part 3 of the Act, which is concerned with pre-border and border measures, is the most relevant. Its purpose is to “provide for the effective management of risks associated with the importation of risk goods”.²³⁸ This is consistent with the point just made, that complete exclusion of risks is not the aim.

[332] Part 3 of the Act seeks to achieve the effective management of risks associated with the importation of risk goods by:

- (a) empowering the Director-General of MAF to issue Import Health Standards (IHSs) setting out the requirements risk goods must meet; and
- (b) prohibiting the clearance of risk goods, unless the risk goods meet the requirements of an IHS.

[333] Risk goods are defined broadly (including anything which constitutes, harbours or contains an organism reasonably suspected of causing unwanted harm to natural and physical resources or human health in New Zealand).²³⁹ The responsibilities under Part 3 for effective management apply to everything that falls within this definition that is to be effectively managed.

[334] The pre-border control mechanism on risk goods are the IHS.²⁴⁰ In summary:

- (a) These specify the requirements for the effective management of risks associated with the importation of risk goods before those goods may be

²³⁸ Biosecurity Act 1993, s 16(a).

²³⁹ Section 2(1).

²⁴⁰ Section 22.

imported, moved from a biosecurity control area or a transitional facility, or given a biosecurity clearance.

- (b) An IHS may relate to goods imported from particular locations or countries or all countries.
- (c) An IHS is issued by the Director-General of MAF following the recommendation of a chief technical officer.²⁴¹ It is worth noting here that the defendant describes an IHS as a form of delegated legislation.²⁴² The plaintiff does not contest this description.
- (d) The recommendation of the chief technical officer involves an evaluative decision. He or she must have regard to a number of generally described matters:²⁴³
 - (i) the likelihood that goods of the kind or description to be specified in the IHS may bring organisms into New Zealand;
 - (ii) the nature and possible effect on people, the New Zealand environment and the New Zealand economy of any organisms that goods of the kind or description specified in the IHS may bring into New Zealand;
 - (iii) New Zealand's international obligations; and
 - (iv) such other matters as the chief technical officer considers relevant to the purpose of Part 3.

²⁴¹ Section 22(1) (at the relevant time). A chief technical officer is appointed by the Director-General as being a person with appropriate experience, technical competence and qualifications (s 101).

²⁴² It says the two defining features of delegated legislation are: (a) that it is made pursuant to an empowering provision and (b) that it has legislative effect: RI Carter, RM Malone and JS McHerron *Subordinate Legislation in New Zealand* (1st ed, LexisNexis, Wellington, 2013) at 4, 9 and Mary Harris and David Wilson (eds) *McGee Parliamentary Practice in New Zealand* (4th ed, Oratia Books, Auckland, 2017) at 462. Import Health Standards are made under s 22 of the Act. They have legislative effect in that they alter the content of the law applying to the public/a class of the public (see Legislation Act 2012, s 39(1) for the definition of "significant legislative effect").

²⁴³ Biosecurity Act 1993, s 22(5).

- (e) A permit might be required by the IHS before risk goods may be imported. Such permit is to be issued by the Director-General. The Director-General's decision to issue a permit is discretionary: it "may" be issued if "he or she thinks fit".
- (f) The chief technical officer must also consult with those persons he or she considers to be representative of the classes of persons having an interest in the IHS (unless the IHS needs to be issued urgently).
- (g) Consultation may be on the IHS or on the risk assessment of the goods or class of goods.
- (h) There is a public register of IHSs.

[335] All goods (defined as "moveable personal property") must receive biosecurity clearance before they enter New Zealand.²⁴⁴ An inspector "may" give a clearance for the goods to enter New Zealand.²⁴⁵

[336] To give a clearance an inspector must be satisfied either that the goods are not risk goods or, if the goods are risk goods, that the requirements set out in s 27 are met. These requirements are as follows:²⁴⁶

27 Inspector to be satisfied of certain matters

An inspector shall not give a biosecurity clearance for any goods unless satisfied that the goods are not risk goods; or satisfied—

- (a) that the goods comply with the requirements specified in an import health standard in force for the goods (or goods of the kind or description to which the goods belong); and
- (b) that there are no discrepancies in the documentation accompanying the goods (or between that documentation and those goods) that suggest that it may be unwise to rely on that documentation; and

²⁴⁴ Section 25 provides that all uncleared goods arriving on any craft must proceed to a transitional facility or a biosecurity control area.

²⁴⁵ Section 26.

²⁴⁶ Section 28 concerns new organisms and is not presently relevant.

- (c) in the case of an organism, that the goods display no symptoms that may be a consequence of harbouring unwanted organisms; and
- (d) that the goods display no signs of harbouring organisms that may be unwanted organisms; and
- (e) there has been no recent change in circumstances, or in the state of knowledge, that makes it unwise to issue a clearance.

[337] Other parts of the Act are concerned with what occurs in the event pests or unwanted organisms make it past the border. The Act provides for the surveillance, monitoring and management of, and response to such incursions. There are also compensation provisions, immunity provisions for those exercising power under the Act and offence provisions.

[338] The Act also contains provisions for the recovery of costs. The Director-General is required to:²⁴⁷

... take all reasonable steps to ensure that so much of the costs of administering the Act, including costs incurred as the management agency of a pest management strategy, as are not provided for by money appropriated by Parliament for the purpose are recovered in accordance with the principles of equity and efficiency ...

[339] Levies are imposed by Order in Council.²⁴⁸ An Order in Council is not made unless the Director-General satisfies the Minister that the levy is in accordance with the principles of equity and efficiency, and the persons who will be paying for the levy will either benefit from the service or function for which it is charged or create the risks which require that service or function.²⁴⁹

[340] In this case, Kiwi Pollen paid a fee for its pollen permit application. Kiwi Pollen was also advised that MAF had a provision to enable self-funding of a risk analysis where Crown funding was unavailable. There was also evidence about the recovery of costs through charges imposed on importers for border clearance services. The evidence was that in the 2009/10 year these nearly covered the total cost of cargo

²⁴⁷ Section 135(1).

²⁴⁸ Section 139.

²⁴⁹ Section 140. Charges and levies are therefore subject to Ministerial approval. They are also subject to guidelines laid out by Treasury and the Office of the Auditor-General. Levying requires consultation and goes through an Order in Council process. It can lead to judicial review. It is also a political decision.

clearance (\$28,849,000 cost and \$25,427,000 revenue from levies and fees) and that the fees and levies subsequently have increased substantially.

The international context

[341] As noted, the chief technical officer is required under s 22 of the Act to have regard to New Zealand’s international obligations when recommending an IHS. New Zealand’s international trade obligations form an important context against which decisions on the importation of risk goods are made. As discussed in the “Factual Background” section of this judgment, under the SPS Agreement:

- (a) governments retain the right to determine their appropriate level of risk to human, animal and plant life and health,²⁵⁰ but
- (b) must be able to demonstrate that the least trade-restrictive measure to achieve a government’s appropriate level of protection (ALOP) is chosen;²⁵¹
- (c) must be able to justify any restrictive “measure” on the basis of science;²⁵² and
- (d) the issuing or amending an IHS, or refusing import permits for a class of commodities is a “measure.”

[342] New Zealand does not publish a formal ALOP. However New Zealand’s biosecurity system is based on risk analysis on science and is aimed at ensuring significant risks are being managed so that the risks are negligible at import. This is not “a blank statement” that risks have to be “negligible”. It is an overall risk assessment on the basis of how significant the pest is, the likelihood of the pest getting

²⁵⁰ Referred to as “the Government’s “appropriate level of protection” (ALOP).

²⁵¹ “SPS Measure” is defined broadly under Annex A of the SPS Agreement and includes “any measure applied” – “(a) to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms”.

²⁵² SPS Agreement, Art. 2.2.

into New Zealand and the likelihood of it establishing. MAF's 2006 risk analysis procedures provided guidance on this basis.²⁵³

The Public Finance Act and appropriations

[343] MAF is funded through direct Crown funding. MAF, like all government departments, operates in an environment of limited public resources. It therefore competes for funding with other Crown activities (health, education, police, etc). Funding and allocation decisions are political. The Minister and MAF are accountable to Parliament for what the funds appropriated have achieved.

[344] As discussed above, MAF may also impose levies and charges for their border service which are subject to Ministerial approval.

This case: foreseeability

[345] The plaintiffs submit they readily pass the screening mechanism of foreseeability. They say their loss was a plainly foreseeable consequence of MAF's negligence in the performance of its biosecurity obligations.

[346] The defendant does not submit otherwise. He simply emphasises that foreseeability is a non-determinative screening mechanism and that one of the reasons for this is to avoid hindsight reasoning. The defendant refers to many statements about the dangers of hindsight reasoning. For example, from Gleeson CJ in *Rosenberg v Percival*.²⁵⁴

There is an aspect of such a question which may form an important part of the context in which a trial judge considers the issue of causation. In the way in which litigation proceeds, the conduct of the parties is seen through the prism of hindsight. A foreseeable risk has eventuated, and harm has resulted. The particular risk becomes the focus of attention. But at the time of the allegedly tortious conduct, there may have been no reason to single it out from a number of adverse contingencies, or to attach to it the significance it later assumed. Recent judgments in this Court have drawn attention to the danger of a failure, after the event, to take account of the context, before or at the time of the event, in which a contingency was to be evaluated.

²⁵³ This explanation of New Zealand's ALOP was from Barry O'Neil.

²⁵⁴ *Rosenberg v Percival* [2001] HCA 18, (2001) 205 CLR 434 at [16].

[347] Those comments are made in the context of causation rather than duty. However a similar point can be made at the duty stage. If a lack of care has caused harm, it is tempting to say the harm was foreseeable and a duty of care should be owed.²⁵⁵ That of course is not the correct approach.

[348] I accept the plaintiffs' claim does pass the screening mechanism of foreseeability. As the plaintiffs submit, MAF operated under legislation intended, amongst other things, to exclude pests and unwanted organisms. The evidence shows that:

- (a) MAF knew that kiwifruit was a key export crop for New Zealand for which border security was of real importance.
- (b) MAF had established policies and processes specifically directed at protecting New Zealand from diseases that would threaten the kiwifruit industry.
- (c) MAF knew that Psa had the potential to cause serious damage to New Zealand kiwifruit orchards. It knew that kiwifruit growers were highly concentrated geographically. It was foreseeable that, if Psa infected a kiwifruit orchard, it would spread.
- (d) MAF communicated with the key kiwifruit industry participants and had a good understanding of the structure of the New Zealand kiwifruit industry, including the role played by post-harvest operators. It was foreseeable that post-harvest operators would suffer losses if Psa infected orchards.

²⁵⁵ The point is made in the majority judgment in *Couch (No 1)* at [118] that “[i]t is important in making the necessary assessment to avoid the wisdom of hindsight. The assessment should be made prospectively.”

This case: proximity

Overview of the submissions

[349] The plaintiffs submit their relationship with MAF was proximate. They submit the statutory scheme, MAF's control, the plaintiffs' vulnerability to the consequences of MAF's negligence and that they were an identifiable class at particular risk of loss from MAF's negligence gives rise to that proximity. They submit MAF was a gatekeeper, controlling biosecurity risks and managing risks if they eventuate. They say MAF's role was akin to that of the councils rather than the BIA in the building cases.

[350] The defendant submits there is no proximity because:

- (a) The manner and extent of protection of the national border, and the level of resources involved, involves a wide range of public policy and political considerations, determined by the legislative and executive branches of government.
- (b) The legislative context does not contemplate, and is inconsistent with, a private law duty of care to the plaintiffs.
- (c) There is no close and direct relationship between the relevant MAF personnel and the plaintiffs.

Does the duty trespass into a non-justiciable or political sphere?

[351] The MAF personnel acts or omissions at issue concern goods that pass across New Zealand's border. The defendant says the border is a defining feature of the political and legal authority of a nation state.²⁵⁶ Border protection relates to military, terrorist or criminal intrusions, immigration, economic activities (e.g. bans on undesirable goods, or tariffs), and public health concerns as well as biosecurity risks.

²⁵⁶ The defendant refers to A Ladley and N White *Conceptualising the Border Institute of Policy Studies* (Victoria University of Wellington, 2006) at 1-2 and 8-9.

While the present claims are directed to biosecurity, the defendant says their logic must apply to these other areas.

[352] Further, the defendant submits the manner and extent of border protection, and the level of resources involved, involves a wide range of public policy and political considerations, and is determined by the legislative and executive branches of government. It engages the resources available to the border (and the legislature's and executive's appetite for providing more resources, whether by general taxation or from levies), the priorities of the Government and the danger of "overkill".

[353] More specifically, the defendant submits that risk analysis and decisions about how and when goods at the border are to be cleared involve trade-offs between resource allocation, the needs of domestic industry, public policy regarding illegal activity, and New Zealand's international obligations and reputation (with potential practical trade effects). The defendant submits such decisions appropriately lie with Government. He says this is all the more so because the plaintiffs' central thesis is that New Zealand should have imposed measures under the Act preventing any importation of kiwifruit pollen for commercial purposes.

[354] The defendant submits imposing a duty of care here would require the Government to reprioritise biosecurity resourcing. If formal risk analysis is required for every import request, this may bring trade to a standstill while importers await the completion of formal risk analysis. This in turn may incentivise illegal import (smuggling) of risk goods and increase the biosecurity risk to New Zealand. The defendant says there is also the prospect that New Zealand's trading partners may criticise New Zealand for taking an overly conservative approach to risk analysis.

[355] These submissions concern the justiciability of the pleaded duty. That is, if a duty of care were imposed, the contention is that it would involve the Court trespassing into discretionary decisions on the allocation of scarce resources and this is not an appropriate role for a Judge. I do not accept this submission. In contrast with, for example, *George v Newfoundland and Labrador*,²⁵⁷ the causes of action do not challenge MAF's strategy and approach for dealing with risk goods. This is not a

²⁵⁷ Discussed under the "Public authorities" section above.

claim for institutional negligence.²⁵⁸ The causes of action concern alleged negligence in carrying out the processes which MAF had in place. This is similar to the inspector in *Givskud* who was carrying out his duties under the Government's policy. The plaintiffs consider that, had MAF carried out its processes non-negligently, measures would have been imposed on commercial pollen imports on the basis of science, in accordance with the Act and the SPS agreement.

[356] This means that imposing a duty of care does not require the Court to make any judgment about how the border is to be protected and the level of resources necessary to protect the border. It does not intrude upon the public policy and political considerations about that. The issue for the Court is whether MAF personnel were negligent in carrying out the risk assessment of a permit application which the Act and MAF's procedures required, or were negligent when assessing whether the consignment complied with the requirements specified in the relevant IHS or whether it would be unwise to rely on the accompanying documentation as required by the Act and MAF's procedures.

[357] It is the case that the alleged negligence in the first cause of action took place in the context of a backlog of work and staff changes. It is also the case that the alleged negligence in the second cause of action took place in the context of a huge amount of goods arriving at the border on a daily basis.²⁵⁹ While greater resourcing might assist in responding to the challenges of the scale of work, recognising the pleaded duty of care in this case makes no judgement on that. It is a matter for the Government how it responds to a serious biosecurity breach and its consequences however that has arisen. The evidence suggests the Government did respond to the Psa incursion. In 2007 the Plant Imports team employed eight full-time equivalent staff. By the time of the hearing of this case, this had increased to around 28 to 30 staff (although the increase was also at least partly to meet the continuing increasing demands of trade).

²⁵⁸ See discussion of this "Part 7: Crown Immunity".

²⁵⁹ Mr Gilbert, the Director of Border Clearance Services at the time of the hearing, calculated it would cost \$79.5 million per year and require 550 staff if every shipping container was inspected by a MAF Quarantine Officer. If this cost was imposed by charges or levies, that would be a significant form of taxation.

Is a duty of care inconsistent with the range of interests that must be considered under the Act?

[358] The defendant submits the legislative framework is crucial to considering a novel negligence claim against a public authority exercising discretionary powers.²⁶⁰ The Act's purposes are widely expressed.²⁶¹ Broad responsibilities and powers are conferred on MAF.²⁶² The regime involves a range of participants, it involves expectations of cooperation and coordination, and it contemplates addressing biosecurity risks in various ways.

[359] MAF has a regulatory role in this regime. If MAF decided not to allow kiwifruit pollen to be imported for commercial purposes, this would constitute a "measure" under the SPS agreement. Any such measure is quasi-legislative: it requires a balancing of biosecurity risks and trade relations factors in the general public interest, and it must occur within the context of the defensible scientific understanding of such risks. The defendant submits that, in this role, there is ample scope for conflict between competing interests. MAF's role, as with other regulators, is to act in the interests of the public good generally, not for a particular individual or class of individuals. Consistent with this, the defendant submits the courts have held repeatedly that regulators do not owe a duty of care.²⁶³

[360] In the present context, the interests that required balancing included the desire and need to import risk goods, including for breeding purposes, into New Zealand; the desire to keep pests out of New Zealand; New Zealand's international obligations under the SPS Agreement; New Zealand's reputation for its adherence to the principles

²⁶⁰ Referring to *The Grange*, at [170] per Blanchard J, citing *Fleming v Securities Commission* [1995] 2 NZLR 514 (CA); and at [224] per Tipping J, citing *Attorney-General v Carter* [2003] 2 NZLR 160 (CA).

²⁶¹ Relating to concepts of public good: human health; the environment; tangible resources; international relations and trading activities; and national economic performance.

²⁶² For example, declaring restricted places or controlled areas; designating ports of entry; approving transitional and containment facilities and quarantine areas; issuing or amending IHSs; clearing risk goods for entry; seizing suspected new or restricted organisms; exercising powers of entry; inspection; detaining; seizure and destruction; requiring the provision of information; and directing aerial spraying of properties (amongst others).

²⁶³ The defendant refers to a number of cases in a range of areas, including the following cases discussed or referred to earlier in this section of the judgment: the building industry: *The Grange* and *Sacramento*; environmental protection: *Cromane Seafoods*; marine viruses: *Regent Holdings* and *Graham Barclay Oysters*; bovine pathogens: *D Pride*; human disease: *Eliopoulos Estate*; building products: *Attorney-General v Carter*; law and order: *Hill and Michael*.

of the SPS Agreement; and the need to ensure that border “settings” do not incentivise illegal behaviour. The defendant submits a private law duty of care as pleaded would inevitably complicate the necessary balancing process and the consequent quasi-legislative or regulatory judgements that the Act requires MAF personnel to make.

[361] The defendant says the situation facing MAF, when Zespri asked it to halt Italian kiwifruit imports following the Psa outbreak in Italy, is an illustration of the potential conflicting interests that arise. MAF declined to do so because it considered there were insufficient grounds to do so.²⁶⁴ Exporting countries wish to obtain market access to New Zealand and New Zealand wishes to obtain reciprocal access for our products to these countries. New Zealand cannot and does not wish to deny market access unless there are sufficient grounds to do so.

[362] There is also the potential for conflict in other decisions under the Act. For example, as between importers and exporters.²⁶⁵ New Zealand importers want access to overseas products and are generally seeking to reduce the costs of trade, while the domestic industry is generally seeking higher controls on the overseas products to be imported. The defendant submits that decisions under the Act involve a delicate balancing exercise and that MAF cannot owe a duty to a particular industry given this delicate balance.

[363] I accept that MAF has to consider a range of factors when it makes a decision on the import of risk goods and there may be conflicting interests at stake. In the present case, MAF’s decision on whether to grant Kiwi Pollen’s import permit involved the interests of Kiwi Pollen (who wished to have the pollen for its business), the interests of the Chinese exporter (and other exporters such as the Chilean exporters of pollen with which Kiwi Pollen was doing business), the interests of the New Zealand Government (which wished to comply with our international obligations and to be seen to do so), the interests of primary industries (for whom new sources of germplasm were important) and the interests of kiwifruit growers (who might wish to use the pollen for artificial pollination).

²⁶⁴ This is discussed further in the “Part 4: Breach – first cause of action” section of this judgment.

²⁶⁵ Other examples are as between producers utilising different breeds or varieties for primary production; and also in relation to processing delays, approval (or not) of facilities, fumigation techniques and prioritisation of inspections or analyses.

[364] It was also in the interests of kiwifruit growers, and those businesses dependent on the supply of kiwifruit, that Kiwi Pollen's application would not be approved if there were risks of disease from its use. To some extent, the Chinese exporter, Kiwi Pollen and the Government had a similar interest, because it would not be in any of their interests if pollen imported into New Zealand was responsible for causing a disease outbreak. There may have been different views within or between these parties about the level or risk that was acceptable. However this is resolved by New Zealand's ALOP and our international agreement to be able to justify any restrictive measure on the basis of science.

[365] Moreover, MAF was structured to avoid conflicts of this kind in decisions on risk goods. Barry O'Neil, the head of Biosecurity New Zealand at the relevant time, gave evidence that risk analysis was separate from the IHS team for good practice reasons.²⁶⁶ Risk assessors did the risk assessment of the organism. This was purely a technical decision. The IHS team addressed the measures to mitigate the risk to enable the goods to be imported. The operational staff were given guidance on New Zealand's ALOP through documents such as MAF's 2006 Risk Assessment Procedures. There was no political interference in these decisions under the Biosecurity Act.

[366] The alleged duty of care does not rank the interests of primary production, or kiwifruit growers and those businesses who depend on the supply of kiwifruit, over other interests. It proceeds on the basis of the Act (which permits market access for risk goods in accordance with an IHS), New Zealand's ALOP and its international obligations. The duty does not challenge any of these things.

[367] The first cause of action alleges MAF personnel were negligent in their assessment of the risks posed by the import of kiwifruit pollen. It also contends MAF was negligent in its response to the Italian outbreak by failing to initiate a pest risk assessment for Psa, and to thereby identify pollen imports as a pathway risk. The plaintiffs contend non-negligent assessments would have meant, in accordance with

²⁶⁶ As head of Biosecurity New Zealand (BNZ) he reported to Murray Sherwin, the Director-General of MAF. BNZ had four directorates: the Policy and Business Directorate; the Biosecurity Strategy Unit; the Pre-Clearance Directorate; and the Post-Clearance Directorate. Pre-Clearance had four sections: exports, border monitoring, risk analysis and biosecurity import health standards.

the Act, New Zealand's ALOP and its international obligations, that pollen imports would not have been permitted on the basis they were.

[368] A duty to carry out non-negligent risk assessments (before approval to import risk goods is given or when there has been an outbreak of a disease in a country which exported goods to New Zealand) does not conflict with other duties under the Act. Rather, the duty marches “hand-in-hand” with the Act's purpose of effectively managing the risks associated with the importation of risk goods, New Zealand's ability to set its own appetite for risk and its obligation to make its decisions on the basis of science.²⁶⁷ It is consistent with the delegated legislation (the IHS for nursery stock) which postponed the required risk assessment for pollen imports until an application for a permit was made.

Is the statutory purpose inconsistent with a private law duty?

[369] A related submission is that powers exercisable for the public good are inconsistent with proximity with a particular individual or limited class of people. In the present case, the public interest under the Act is the “management” and “minimisation” of (not “protection” from) risks from organisms that may cause harm to natural or physical resources or human health in New Zealand. This recognises pests will continue to breach New Zealand's borders because of the risk inherent in international trade.

[370] The defendant submits this focus is inconsistent with the idea that the relevant powers could found a private law duty of care owed to individuals or limited classes economically impacted by a biosecurity risk being realised. He refers to the following passage from *Michael*:²⁶⁸

... it is a feature of our system of government that many areas of life are subject to forms of state controlled licensing, regulation, inspection,

²⁶⁷ In *Couch (No 1)* at [58]-[59] per Elias CJ (with Anderson J agreeing), the point was made that the Probation Service was obliged to undertake the supervision. That was its statutory duty. Since it was obliged to exercise its statutory powers reasonably, a duty of care in negligence would “march hand in hand” with its statutory responsibilities. Whether recognising a duty of care in this case would create incentives to act with excessive caution (contrary to New Zealand's international obligations and the interests of exporters and importers) is a policy consideration which I discuss later.

²⁶⁸ *Michael* at [113]-[114] per Lord Toulson (with whom Lord Neuberger, Lord Mance, Lord Reed and Lord Hodges agreed). Noted in the discussion under “Public authorities” above.

intervention and assistance aimed at protecting the general public from physical or economic harm caused by the activities of other members of society (or sometimes from natural disasters) ...

It does not follow from the setting up of a protective system from public resources that if it fails to achieve its purpose, through organisational defects or fault on part of an individual, the public at large should bear the additional burden of compensating a victim for harm caused by the actions of a third party for whose behaviour the state is not responsible. To impose such a burden would be contrary to the ordinary principles of common law.

[371] As explained in the lead judgment in *Robinson, Michael* is an omissions case.²⁶⁹ The police failed to respond in time to an emergency call. The harm was caused by a third party for whose behaviour the state was not responsible. The mere setting up of a protective system from public resources was not sufficient to found a private duty of care in these circumstances.

[372] However, as *Robinson* and *Michael* discussed, the omissions principle is subject to exceptions. Sufficient proximity may arise in particular circumstances, for example where the authority has created a danger and has control over it.²⁷⁰ This point is made in *Graham Barclay Oysters*.²⁷¹ That was a claim of omission (a failure to exercise available discretionary powers exercisable for the public good).²⁷² But, as recognised in that case, the public authority may come under a duty of care if it has used its powers to intervene in a field of activity and increased the risk of harm to persons. *Dorset Yacht* provides an example of a duty of care arising. *Couch (No 1)* provides a similar example.²⁷³

[373] This means that, although the Biosecurity Act has broad scope and responsibilities aimed at the general public good, that does not exclude a private law duty. It depends on whether circumstances have arisen which give rise to proximity

²⁶⁹ Lord Toulson at [97] of *Michael* commenced his discussion on whether a duty of care was owed with an explanation of the omissions principle: “It is one thing to require a person who embarks on action which may harm others to exercise care. It is another matter to hold a person liable in damages for failing to prevent harm caused by someone else.”

²⁷⁰ Lord Toulson at [99] of *Michael*, referred to the *Dorset Yacht* and *Couch (No 1)* situations where the defendant is in a position of control over a third party and should have foreseen the likelihood of the third party causing damage to someone in close proximity if the defendant failed to take reasonable care in the exercise of that control.

²⁷¹ Discussed under “Other biosecurity examples” above.

²⁷² Similarly, *Regent Holdings, Eliopoulos* and *Hill* (some of the cases the defendant relies on in support of its submission that regulators do not owe duties of care) are omission cases.

²⁷³ Discussed under “the New Zealand examples” section above.

between MAF's actions or inactions and an individual or identifiable and sufficiently delineated class.

Is this an omissions case?

[374] The defendant submits that the plaintiffs' case is essentially that MAF could have done more to keep Psa3 out of New Zealand. To this extent it is a claim of omission. The defendant submits it therefore engages the concerns that arise when a duty of care is alleged against a regulatory authority for failing to regulate to prevent harm.

[375] As discussed earlier, there can be difficulties with, and differences in view about, whether a case is one of commission or omission. For example, Tipping J in *Couch (No 1)* described the case as engaging the omissions principle. As with *Dorset Yacht*, this was because the Probation Service failed to undertake sufficient supervision of the parolee. On the other hand, it might be said the negligence was one of commission. The Probation Service had given permission for the parolee to work in an unsuitable place given the risks he posed to others at that place. The reason why the case is regarded as one of omission rather than commission is that the direct cause of the harm is the actions of a third party.²⁷⁴ The general principle is that a person is bound to take care not to inflict damage on, but is not bound to take care to prevent injury to, another person.²⁷⁵ The omission in the *Couch (No 1)* and *Dorset Yacht* situation is in failing to control the risk when there is a duty to do so.

[376] Here MAF was charged with deciding whether to grant Kiwi Pollen's import application. MAF personnel considered the application and granted it. MAF was also charged with deciding whether the import could be cleared. MAF personnel checked the documentation and cleared it. These are positive actions carried out allegedly negligently. This is not a classic case of omission as was the case with *Graham Barclay Oysters*, *Regent Holdings* and *Eliopoulos Estate* where there was a discretionary power to act and no action was taken. Of the biosecurity cases discussed it is probably most similar to *Sauer* which concerned the Canadian Government's

²⁷⁴ This distinguishes the case from the example discussed in *Robinson* of failing to apply the brake when speeding.

²⁷⁵ As discussed under "A brief history to the development of negligence liability" above.

alleged negligence in response to the mad cow disease outbreak in the UK. That was considered to give rise to an arguable duty of care.

[377] MAF's omissions in this case are part of wider positive conduct. They do not engage the concerns associated with the omissions principle.²⁷⁶ Nevertheless the direct cause of the loss was a bacterial pathogen in risk goods imported by a third party (Kiwi Pollen). As was said in *Robinson*, generally there is no liability for failing to prevent harm caused by other people or by natural causes. It is therefore appropriate, by analogy with cases involving third parties who have caused harm, to consider the extent to which MAF had control over the risk.

What control did MAF have over the risk

[378] The defendant submits that, if the Psa outbreak came from the imported anthers, the harm was caused by Kiwi Pollen. The defendant says Kiwi Pollen was in the possession of unauthorised goods. He says that, on the plaintiffs' theory, Kiwi Pollen either caused the pollen from those anthers to be applied to the Olympos and/or Kairanga orchards or disposed of the anthers (or pollen from the anthers) in a way which did not prevent the spread of Psa. The defendant's written submissions said that this makes Kiwi Pollen the primary tortfeasor and it is therefore necessary to focus on the control which MAF had of Kiwi Pollen. This was softened in oral submissions to say that things might have been different if Ms Hamlyn had made contact with MAF when she received anthers and this was a factor to be taken into account.

[379] It is true that, at the point that Kiwi Pollen had possession of the anthers, MAF's ability to control what occurred was dependent on being informed by Kiwi Pollen that it had received anthers rather than pollen. Had that occurred MAF would have had the opportunity to consider whether to exercise its powers to inspect, examine and destroy the goods.²⁷⁷ The Biosecurity Act also incentivises someone in the possession of unauthorised goods to inform MAF. This is because a person commits an offence if they have unauthorised goods in their possession, knowing that they are unauthorised.²⁷⁸ Additionally, if a person was not aware the goods were unauthorised,

²⁷⁶ Discussed earlier under "A brief history to the development of negligence liability".

²⁷⁷ Biosecurity Act 1993, ss 109, 114, 121 and 122.

²⁷⁸ Section 154.

the Director-General has a discretion to waive the costs and expenses attendant on the custody and disposal of seized goods.²⁷⁹

[380] However, it is not that simple. Unauthorised goods is a defined term. Of the various categories that fall within the definition, the only one of potential relevance for present purposes is the following:²⁸⁰

Goods which have been given a biosecurity clearance by an inspector following receipt by that inspector of false, incomplete, or misleading information concerning the goods.

[381] In this case the permit was for “Pollen”. However, the special conditions stated “Unopened male flower buds must be hand collected. The pollen may be milled prior to import.” This wording suggested the pollen did not have to be milled prior to import.²⁸¹ Ms Hamlyn accepted that anthers were not what she was expecting but, given the conditions on which the permit was issued, it is not clear she was in possession of unauthorised goods or that she knew she was. She was not cross-examined on this. MAF had the ability to control whether the goods were unauthorised through the conditions on which the permit was granted.

[382] The same point applies to the Chinese exporter and the agency providing the phytosanitary certificate. The male flower buds may have been hand collected and unopened as required by the permit. But after collection in this way, the permit did not specify what was then required. Even though the permit was for frozen kiwifruit pollen, the special conditions suggested the pollen did not have to be milled prior to import.

[383] I therefore consider the correct focus is on MAF’s ability to control the entry into New Zealand of harmful plant pathogens. The starting point for MAF’s control is pre-border. MAF decides whether risk goods may be imported, doing so in accordance with MAF’s ALOP and the SPS agreement that measures can only be imposed if they are scientifically defensible. The defendant submits this means the mechanism for exerting control pre-border is subject to potentially conflicting

²⁷⁹ Section 117.

²⁸⁰ Section 2 definition of “unauthorised goods”, para (c).

²⁸¹ This is discussed under the “Breach: first cause of action” section of this judgment.

international obligations. However, the fact MAF must consider a range of factors where conflicting interests may be at stake, does not take the decision out of MAF's control. MAF may only permit entry of risk goods in accordance with an IHS. An IHS and measures imposed on risk goods under an IHS must be scientifically defensible. That may involve difficult scientific questions and factors for MAF to balance. But those questions and balancing exercises do not alter the fact that MAF makes the decision on whether risk goods may enter New Zealand and on what terms.

[384] The border is the second point at which MAF has control. As the plaintiffs put it, the Biosecurity Act creates a bottleneck or funnel through which uncleared goods must pass. Under the Biosecurity Act, all uncleared goods arriving on any craft must proceed to a transitional facility or a biosecurity area. An inspector must not clear risk goods unless he or she is satisfied the goods comply with the IHS requirements, there are no material issues with the documentation, there are no symptoms or signs of unwanted organisms and no recent material change in circumstances.²⁸² In this way MAF has control over a process which enables it to check that risk goods entering New Zealand meet the requirements that MAF has set.

[385] Again, MAF's border control role is a difficult one. This is because the bottleneck delays goods from reaching their destination within New Zealand. The border control must therefore balance the need to protect New Zealand from risk goods with the need not to unduly hinder commerce through border delays. Nonetheless, the fact remains that MAF exercises control over this, admittedly difficult, process.

[386] As already mentioned, MAF also has some powers of control should it learn that unauthorised goods have entered New Zealand (despite the pre-border and border controls). It also has powers if it has reasonable grounds to believe a pest or unwanted organism is present in the country. These powers include, for example, declaring a place to be a restricted place, pursuant to which controls on the movement of goods can be imposed.²⁸³

²⁸² Biosecurity Act 1993, s 25.

²⁸³ Section 130.

[387] In summary, MAF has control over the entry of risk goods and powers to exercise control if it learns unauthorised risk goods have entered the country or that pests or harmful organisms are present. The effectiveness of these controls is hampered by the difficulties inherent in biosecurity border control for a country dependent on international trade.

What reliance is placed on MAF's border control role

[388] A question which may be linked to the question of control is whether the plaintiffs relied on that control. However, as explained in *Spencer on Byron*, in contrast with negligent misstatement cases where the proximity is founded on specific reliance reasonably placed by the plaintiff on the defendant's advice,²⁸⁴ when proximity is founded on control over the risk, reliance may play a less central role.²⁸⁵ The same view was taken in *Givskud*.²⁸⁶

[389] In other words, the requirements of proximity depend on the circumstances at issue. The duty of care on councils in building cases is founded on the control they have (through the consent, inspections and code of compliance process) and the owners' vulnerability to hidden defects (with potential health and safety issues). Such reliance as there is, is usually general rather than specific, and is as much on the state of the law (which has upheld a duty on the council over many years) as on the council. In *Couch (No 1)* proximity was founded on control and the foreseeably distinct and special risk the plaintiff was in (specific reliance did not feature).

²⁸⁴ Refer to the discussion of *Hedley Byrne* under "A brief history of the development of negligence" section above.

²⁸⁵ *Spencer on Byron* at [34]-[35] per Tipping J, and at [199] per Chambers and McGrath JJ, explaining the passage in *Sunset Terraces* at [48] per Tipping J referred to by the defendant.

²⁸⁶ And for a further example, in *Sutherland Shire* at 464 per Mason J: "... there will be cases in which the plaintiff's reasonable reliance will arise out of a general dependence on an authority's performance of its function with due care, without the need for contributing conduct on the part of a defendant or action to its detriment on the part of a plaintiff. Reliance or dependence in this sense is in general the product of the grant (and exercise) of powers designed to prevent or minimise the risk of personal injury or disability, recognised by the legislature as being of such magnitude or complexity that individuals cannot, or may not, take adequate steps for their protection. This situation generates on the one side (the individual) ... a general reliance or dependence on its exercise of the power ... The control of air traffic, the safety inspection of aircraft and the fighting of a fire in a building by a fire authority ... may well be examples of this type of function."

[390] In this case the plaintiffs did not place specific reliance on MAF to act with reasonable care in deciding whether to grant Kiwi Pollen approval to import pollen or in deciding whether to grant clearance to the June 2009 anthers consignment. It did not know any such application had been made, nor did it know the consignment was on its way to the border. Nor is there a contractual or licensing arrangement whereby the plaintiffs pay a fee to MAF for protection from border biosecurity risks. Nor is there evidence that orchardists made decisions about the management of their orchards relying on MAF to protect the border. To the extent orchardists thought about MAF's control of the borders, it was a general assumption that they would do their job.²⁸⁷

[391] Added to that general assumption is the evidence that the interests of the industry were represented by other bodies, such as Zespri. The evidence was that Zespri engaged with MAF on biosecurity issues. Mr Jager, Zespri's CEO at the relevant time, said the industry relied on Zespri to discuss biosecurity issues with MAF (KVH is now the body which focusses on this on behalf of the industry). The evidence is that, for its part, MAF was aware of this. Zespri was amongst the bodies that MAF would consult with on kiwifruit biosecurity issues. For example, MAF consulted with Zespri on a proposed amendment to the *Actinidia* schedule of the IHS in 2004. In its submission Zespri said:²⁸⁸

The New Zealand Kiwifruit Industry is relatively untroubled by production pests. The high productivity and lower costs that result from this low orchard pest status have a direct economic benefit but are also vital to our ability to export fruit worldwide. The low pest status has also made it possible to export nursery stock of Hort16A for offshore production by ZESPRI-licensed suppliers. For these reasons ZESPRI considers that Biosecurity is very important for the New Zealand Kiwifruit Industry.

[392] Mr Jager confirmed in his evidence that this submission reflected Zespri's expectations and the importance of biosecurity to the industry. Again, this is in the nature of general reliance. It is similar to the evidence of general reliance in *Givskud*. Biosecurity is the kind of responsibility discussed in *Sutherland Shire*. It is not the kind of case where proximity requires that there be evidence of specific reliance.

²⁸⁷ For example, Mr Burt, the director and shareholder of Strathboss, said that before Psa, he only knew about border controls when entering or leaving the country, he was not familiar with the Biosecurity Act or how MAF's biosecurity operations were funded. He assumed that the border would keep pests out of New Zealand.

²⁸⁸ Ministry of Agriculture and Forestry *Analysis of submissions on draft import health schedules for seed for sowing and nursery stock of Actinidia* (Released for consultation on 17 March 2004).

Were the plaintiffs distinctly vulnerable?

[393] More relevant than reliance in this type of case is vulnerability. The plaintiffs submit they were particularly vulnerable to a failure by MAF to perform its border control functions carefully. They say MAF was operating under legislation specifically designed to protect New Zealand’s primary industries from biosecurity risks. The plaintiffs refer to the minority reasoning in *Couch (No 1)* that vulnerability is especially important to the proximity inquiry “where individuals cannot take steps for their own protection or where social conditions have led individuals to rely on fulfilment of statutory responsibilities.”²⁸⁹

[394] The plaintiffs refer to MAF’s powers to monitor and control risks and its ability to impose charges for cost recovery. In contrast, the plaintiffs could not do anything to protect or mitigate against the risk because they had no knowledge of imports occurring (unless consultation with them occurred), they do not have insurance for the risk and once there is an incursion they have no or limited ability to control its spread.

[395] The defendant submits the plaintiffs’ case makes too much of their vulnerability. He accepts that no kiwifruit grower in New Zealand was able, by its own efforts, to protect their orchard against Psa3 infection once the organism had established itself here. But he submits that this is too narrow a focus. The whole of New Zealand – humans, primary industries and the environment – is similarly vulnerable to realised biological risks. The kiwifruit industry is no more nor less vulnerable than any other primary industry.

[396] The defendant submits the kiwifruit industry was not especially vulnerable to a negligent exercise of MAF’s powers because it is a resilient, optimistic and self-determining industry. As set out under the “Factual Background” part of this judgment, the industry has “bounced back” from a market crash in the 1990s and from the Psa incursion in 2010. It has 30 per cent of global kiwifruit sales despite its distance from the main export markets, the strength of the New Zealand dollar and high land and labour costs. It has sophisticated, unifying governance arrangements. Those arrangements enabled it to lead the response to the Psa incursion. This included

²⁸⁹ *Couch (No 1)* at [64] per Elias CJ and Anderson J.

by arranging an initial response fund together with an ongoing research fund and having new varieties in development which could be released to growers. These varieties included the G3 variety which turned out to be more resistant to Psa and popular with consumers and has led to record returns for kiwifruit growers.

[397] Further, the defendant submits that it was not just the growers (and Seeka) who were vulnerable to the effect of the Psa3 incursion. The whole of the kiwifruit industry (orchard managers, the various categories of contractors and their employees) were no more nor less “vulnerable” to the effect of the Psa3 incursion. He asks, if a duty is owed, does it extend to:

- (a) all persons with an economic interest in the kiwifruit industry?
- (b) all enterprises providing services to kiwifruit orchards?
- (c) all persons with an economic interest directly dependent on the supply of kiwifruit for post-harvest processing and export?
- (d) all persons with a direct economic interest in growing kiwifruit for sale?
- (e) kiwifruit orchard owner-growers?

[398] In other words, this is similar to the farmers unable to move their cattle, the transport operators, the dairymen (and women) and the sellers of cattle food referred to in *Weller & Co*. The defendant submits that, in cases such as *Couch*, it might have been held that any member of the public employed alongside the probationer was vulnerable. However the Supreme Court majority’s judgment makes it clear that, to be determinative, vulnerability must be related to special risk circumstances which truly distinguish the position of the plaintiffs in relation to the risk.²⁹⁰ The defendant

²⁹⁰ *Couch (No 2)* at [122]-[124]. The defendant submits the majority reasoning aligns with the orthodox position in *Dorset Yacht* which sets close limits on the scope of liability imposed on defendants where another person (or thing) is the primary cause of the alleged loss. He submits the importance of setting close limits, and the need to consider the relationship as between the defendant and the third party as well as the relationship between the defendant and the plaintiff was endorsed in *Michael*. I note that *Michael* endorsed the need to look at both the relationship between the defendant and the third party, and the relationship between the defendant and the plaintiff, but left open the test for the special relationship.

says the same point is a feature of other biosecurity cases, such as *Graham Barclay Oysters* and *Regent Holdings*.

[399] The defendant submits there is nothing distinctive about the growers. There was no contractual or licensing arrangement, there was no professional or personal relationship between MAF personnel and growers, there was no physical presence or oversight by MAF personnel in relation to growers' premises or activities, the Psa risk was not one knowingly brought into or near the growers' orchards by MAF personnel and MAF personnel were carrying out a broad and regulatory role that was not limited to any specific risk nor focussed on any particular individual or limited class.

[400] As the defendant submits, it is the majority reasoning in *Couch (No 1)* that binds this court. Therefore it is not a case of simply asking whether the plaintiffs were unable to take steps for their own protection or had been led by social conditions to rely on a public body to fulfil its statutory responsibilities, although these factors may be important when considering policy factors.²⁹¹ As explained in the majority's reasoning in *Couch (No 1)*, where a duty is founded on a public authority's power to control a risk (in that case the risk of a third party) in a way which would have prevented the harm, it is also necessary to consider the relationship between the defendant and the plaintiff:²⁹²

... That relationship [between defendant and plaintiff] must also be special in the sense that there is sufficient proximity between the parties to render it fair, just and reasonable, subject to matters of policy, to impose the duty of care in issue. ... As we will demonstrate, it is also necessary for proximity purposes to assess the nature of the risk which the immediate wrongdoer posed to the plaintiff. The more specific and obvious that risk is, the stronger will be the case for holding that the defendant (having sufficient power and ability to eliminate or at least reduce the risk) had a duty of care to the plaintiff, fulfilment of which required the reasonable exercise of that power and ability. There is a need for both qualifying relationships (control and proximity), not only in cases which require the defendant to control the immediate wrongdoer, but also in cases which require the defendant to give a warning to the plaintiff on account of control having failed or not been exercised or attempted.

²⁹¹ See *Spencer on Byron* at [199] per Chambers and McGrath JJ discussing the rationale for not altering the law in the building cases following *Murphy*: "This reliance on the existing state of the law – which the Court thought might well have influenced behaviour over the previous 20 years – was an important *policy factor* for *not changing the law*."

²⁹² *Couch (No 1)* at [85] per Tipping J (with Blanchard and McGrath JJ agreeing).

[401] The existence of an identifiable person or group that is foreseeably subject to a special and distinct risk therefore provides the necessary connection (proximity) between a defendant and a plaintiff when a defendant is exercising powers which are for the public good. The analysis of the relationship between the defendant and the plaintiff concerns the point at which the defendant has the opportunity to control the particular risk. Accordingly, the question in *Couch (No 1)* was asked in relation to the placement of the particular parolee at the particular employment placement. It was not a generic question about whether Probation Services would identify any particular person or group at risk if they failed to control parolees generally. In line with *Couch (No 1)*, the question is what MAF knew or ought to have known about the biosecurity risks of pollen and whether the plaintiffs were a distinct and identifiable group likely to be especially within the foreseeable risk.²⁹³

[402] This means the question is not whether the kiwifruit industry is distinctly at special risk (as compared with other primary industries, humans and the environment) from the negligent exercise of MAF's pre-border and border powers. The question of what MAF knew or should have known is asked in relation to the exercise (or failure to exercise) control over the risk at issue. Here that risk is Kiwi Pollen's importation of pollen from China which MAF was advised was to be used for commercial artificial pollination of kiwifruit orchards. MAF has control over this risk pre-border (through the approval of risk good process) border (through the border clearance process for risk good) and, to a degree, post-border (through its post-border powers).

[403] The defendant submits there was no clearly apparent risk when the import permit was granted or when the June 2009 anthers consignment was cleared because until May 2010, nobody knew that live cells of Psa could be associated with pollen; MAF did not know that kiwifruit pollen could transmit Psa until December 2011; MAF personnel did not know of the Italian outbreak until the November 2009 EPPO alert was received (after the importation of the June 2009 anthers consignment); neither Zespri nor Seeka raised concerns about the Italian outbreak with MAF until July 2010 (despite Zespri and Seeka having financial interests in Italy); and MAF personnel did

²⁹³ The submissions did not distinguish between what was known to MAF personnel generally or at different stages of their biosecurity role.

not know Psa was in China until April 2010 (from where the pollen was being imported).

[404] However this focusses on what MAF actually knew about Psa and pollen, not what it should have known. The plaintiffs' case is that MAF should have known that Psa was a risk with pollen imports, in part because it should have known (if it had carried out the risk assessment non-negligently) that pollen came with plant material parts and Psa was a known pathogen associated with kiwifruit plant material, and it should have known more generally that there were bacteria risks associated with pollen. In any event, the clearly apparent risk was that, if there were risk pathogens associated with pollen to be used commercially for artificial pollination, then kiwifruit orchards receiving that pollination were at special risk.

[405] The defendant submits MAF had insufficient control to found a duty of care. He says MAF has a power to avert harm from the risk but this is insufficient. The mechanism for exercising control is through delegated legislation. The defendant submits that holding a duty of care to exist on this basis would mean any government department or Minister with the ability to prevent harm through delegated legislation would be under a duty of care. Further, the mechanism for exerting control pre-border is subject to potentially conflicting international obligations, and the mechanism at the border for exerting control exists only at the border, not once the goods have cleared the border.

[406] I am not persuaded by these points. As already discussed MAF has control over what risk goods may be imported. The plaintiffs' case is that, had MAF carried out its duties non-negligently, it would not have allowed the pollen to be imported by Kiwi Pollen and that decision would have been consistent with the Biosecurity Act and New Zealand's international obligations. If the plaintiffs establish this,²⁹⁴ then MAF had absolute control over the risk at this stage. Its border and post-border powers provided checks on this process and powers to respond if the process failed and they were aware of that failure.

²⁹⁴ Discussed under "Breach: first cause of action".

[407] MAF's power to control the risk (pathogens on plant imports) is comparable to the Probation Service's power to control a parolee which involves (through the Parole Board) deciding whether they may be released on parole, the conditions on which they will be released and supervision of those conditions. That MAF's power may be exercised pursuant to delegated legislation does not open the floodgates. *Couch (No 1)* accepted it was arguable a duty of care arose in the exercise of the statutory power under consideration in that case. The imposition of a duty of care in relation to other statutory powers will depend on the statutory power and the duty alleged to arise. For example, *Regent Holdings* provides an example where the authority had not been involved in creating the risk and did not exercise direct control over the farm which did.

[408] In my view it is possible to distinguish between the various layers of the kiwifruit industry. As the defendant acknowledges in his submissions, the kiwifruit orchard growers are the most clearly identifiable class of persons who could be foreseen to be adversely affected by the relevant acts or omissions in allowing kiwifruit pollen to be imported. When Kiwi Pollen made its first request to import *Actinidia* pollen on 23 November 2006, it advised "[t]he pollen will be used for pollinating kiwifruit orchards in New Zealand". MAF was also advised that Kiwi Pollen had not imported kiwifruit pollen before – so MAF also knew this would be the first time pollen imported by Kiwi Pollen would be applied to New Zealand kiwifruit orchards. Kiwifruit orchardists were the clearly apparent class of persons whose property (the kiwifruit vines and their crop) would be directly harmed if the pollen contained pathogens. The consequences beyond that immediate harm is at least one step or more removed.

[409] As to those consequences, while it is immediately obvious that vines infected by Psa3 (or other pathogens) may grow less fruit or die, it is less obvious what the impacts of that will be beyond the immediate loss of production. Kiwifruit production can be impacted for all sorts of reasons, including for example severe and unusual weather events. As one witness put it, horticulture is notorious for its "ups and downs". The industry may have arrangements which enable it to respond to adverse events, whatever those events may be.

[410] As events following the Psa3 outbreak showed, the kiwifruit industry did in fact have arrangements in place which enabled it to respond quickly and cohesively to the outbreak.²⁹⁵ Zespri personnel were on the ground in Te Puke assisting immediately when the first symptoms were discovered. The IAC swiftly decided on an industry-led response. A funding agreement with the Crown was in place by December 2010. The kiwifruit industry has recovered from Psa3 and is in a stronger position now than it was before the incursion. Production volumes, export values and land values are now all significantly higher than before Psa3. Part of the reason for this was the early release of G3, a new variety of kiwifruit which is more resistant to Psa and which has been spectacularly successful. But for the Psa3 outbreak, the G3 variety may not have been released until the expiry of Zespri's exclusive rights to produce, sell and licence the Hort16A gold variety in November 2018. Psa has also led to better orchard management practices.

[411] The financial consequences of adverse events may also be mitigated by contractual arrangements. This point is illustrated by the terms of Seeka's three year leases. Under these leases Seeka paid a fixed fee per canopy hectare per annum as a lease for the orchard, as well as a share of the profit made per canopy hectare in each year. These leases contained a clause which enabled Seeka to adjust the payment to the owner, or terminate the payment if in Seeka's opinion it was probable that its crop proceeds (because of crop yields, market forecasts, climatic, post-harvest or other factors) would be insufficient to cover all its costs in operating the orchard to produce the crop in any kiwifruit season.²⁹⁶

[412] The defendant submits this shows Seeka contemplated that, due to foreseen events, there was a risk its revenue or profit may not be sufficient to cover its costs in running the orchard and it made arrangements to minimise the adverse financial impact in that event. The defendant also notes the lease sets out when the parties may terminate the lease, and says it would have been possible for Seeka to insert a force majeure clause allowing it to break the lease. He submits this showed Seeka was not vulnerable and was in a better position vis-à-vis the defendant to bear or avoid the alleged loss.

²⁹⁵ See "Part 2: Factual and regulatory background" of this judgment for more details.

²⁹⁶ Clause 3.4.

[413] I agree this evidence suggests lessors and lessees may be able to make contractual arrangements providing for rent adjustments when kiwifruit seasons are unproductive and termination when unforeseen and significant events arise. However that does not alter the fact that whoever has the property rights in the crops under the lease will have suffered direct property damage to their crop if it is infected with Psa (or treated as though it has been infected and therefore required to be destroyed). The terms of the lease may be relevant to who suffers financial consequences from that physical damage and the extent of those consequences, but the person with property rights in the crop is within the class that is distinctly identifiable as at a special risk.

[414] There are, however, complexities in contractual arrangements which may mean there is more than one party which has a sufficiently direct interest in the vines or crop that the law recognises. Some categories recognised in other jurisdictions are where a person has a possessory or proprietary interest in the damaged property – “general average cases” and “cases where the relationship between the person and the property owner constitute a joint venture”.²⁹⁷

[415] The loss suffered by those affected in downstream businesses is less direct. They may also have arrangements for dealing with low yields in a particular season or seasons. Those arrangements, or the opportunity to make them, diminishes their vulnerability. Such businesses may also be able to diversify at low cost. They may have reserves they can call on to keep the business operating when supply has been interrupted. Banks may agree to put interest and payments on hold. Contractors and employees, for example kiwifruit pickers, may readily be able to substitute kiwifruit work for other work. Downstream businesses are therefore also less distinctly identifiable as at special risk than the owner of the crops.

[416] Seeka’s position as a PHO illustrates this point. The defendant submits Seeka’s losses were heavily influenced by its commercial position and decision making. Other PHOs responded differently when the supply of kiwifruit diminished as a result of Psa3. For example:

²⁹⁷ *Bow Valley Huskey (Bermuda) Ltd v Saint John Shipbuilding Ltd* [1997] 3 SCR 1210 at [46].

- (a) DMS' approach was explained by its managing director, Craig Greenlees, as follows:

This generated a dog fight between PHOs to secure the volume of kiwifruit because we were all short. All PHOs had gaps in their processing through the packhouse and coolstores. This is what happens in a competitive market; everybody thinks they'll steal from everyone else by dropping their price.

A number of PHOs brought down their list price across the board in public. EastPack Limited and Seeka Limited led this move. Different businesses have different vulnerability to price.

DMS didn't participate in the reduction of prices as much as some of the other PHOs. Because more than 60 per cent of our fruit was locked in through ownership management or leasing, we didn't have to enter the fight over packing prices to the same extent as our competitors. We still had sustained kiwifruit volume and, in turn, maintained our cash flow. This meant that we didn't enter the initial price-war and could stand back. We only dropped our price a little later in the cycle in 2013.

- (b) EastPack's approach was explained by its managing director, Tony Hawken, as follows:

We had embarked on a system called LEAN manufacturing in 2008, which led to better systems and process, and reduced our costs considerably. In particular, we have focussed on the principle of continuous improvement. Over that period of time, we have become much more efficient in our production activities, with our variable costs reducing by 28 per cent.

The company also decided to be aggressive in terms of trying to maintain volume. The industry volumes were rapidly contracting. We wanted to ensure that we would be viable, as volume of fruit to pack is the "life blood" of all PHOs. We were able to do this in part because we had a very strong balance sheet through 2011 and 2012. We saw an opportunity to secure more growers to join EastPack and made a decision to go out to the growers in 2012 with a very competitive packing rate – we took 20 cents off our previous rate and didn't pay a rebate. This amounted to a 20 cent a tray discount on the packing costs. We were the first movers in this space and it paid off for us. It was a successful initiative and we secured a lot of new business through this approach. It threw a number of our competitors, with less strong balance sheets, into a bit of a tailspin. We were surprised at the time that other PHOs didn't immediately follow us, but they did more so in 2013.

[417] Post-incursion, EastPack grew its market share, did not have redundancies over the Psa period and is now the biggest PHO. It appears EastPack was able to do this

partly because of its healthy balance sheet. In contrast, Seeka had a debt of \$54.8 million in November 2010. It had recently taken on \$25 million in debt to buy Huka Pac. Post-Psa it sold assets, restructured long-term leases and reduced staffing. The kinds of losses it seeks in this claim include the costs of the decisions it took (for example, the costs of redundancies, and additional capital expenditure to increase packing capacity to maintain overall profits, and the costs of grower incentive schemes implemented to encourage growers to pack fruit with Seeka).

[418] The submission that the kiwifruit industry was not especially vulnerable to a negligent exercise of MAF's powers because it is a resilient, optimistic and self-determining industry, raises distributive justice issues. If the industry is able to fend for itself, the social utility of imposing the full costs of a biosecurity breach on the Government might be questioned. However the bounce back of the industry does not alter the fact that orchardists were directly impacted by the Psa3 incursion, and severely so, before the bounce back occurred. Moreover looking at the position on an industry wide basis masks the fact that individual participants in the industry were affected differently. Some orchardists, for example, were under such financial stress from the incursion that they left the market. Those orchardists were not around to share in the industry bounce back. The industry did not have in place a form of insurance to ensure that losses suffered from Psa3 incursions were evenly spread.

[419] The defendant further submits that the kiwifruit industry is no more vulnerable than any other horticultural or agricultural industry in New Zealand. He submits the basis for the duty of care owed by MAF could equally be made for dairy and the foot and mouth disease;²⁹⁸ the citrus industry and fruit fly; or viticulture and the brown marmorated stink bug. This is a floodgates argument rather than one that concerns whether MAF and any of the plaintiffs are in a proximate relationship on the facts of this case. It is considered later.²⁹⁹

²⁹⁸ While this judgment has been reserved, the dairy industry and MAF have been responding to an outbreak of mycoplasma bovis.

²⁹⁹ See the discussion under "This case: policy factors" below.

Analogies with other recognised duties

[420] I now consider how this case compares with other New Zealand cases. I do so because novel duties of care develop incrementally with reference to their closest analogies in the existing law. This maintains the coherence of the law and avoids inappropriate distinctions.³⁰⁰

[421] The claim by kiwifruit orchardists with property ownership rights in the vines and their crops fits quite closely with *Couch (No 1)*. The control over the risk is similar, as is the vulnerability to direct harm (personal injury to Ms Couch and property injury to orchardists), and the identifiable class at special and distinct risk is comparable. The class in this case may be greater in number although that may depend on patronage of the RSA where the parolee was permitted to work.

[422] It might be said that the risk was more clearly apparent in *Couch (No 1)* because the parolee's criminal history and alcohol issues, which were known to the Probation Service, very obviously made him an unsuitable and dangerous candidate for the employment role he was permitted to have. In contrast, the task of the MAF import team requires a complex assessment of risks and measures. But that considers their task at a general level. If the risk in *Couch (No 1)* is considered at the same level then equally it can be said there are complexities in supervising potentially dangerous parolees.³⁰¹

[423] At a more specific level, the claimed duty relates to whether kiwifruit growers or PHOs were a clearly apparent identifiable class facing a special and distinct risk, if reasonable care was not taken by the MAF import team in deciding whether to grant a permit for pollen to be used for artificial pollination of kiwifruit orchards on a commercial level. Seen in this way, it is an inescapable conclusion that kiwifruit orchardists were identifiable as being at special risk. The same conclusion does not follow for PHOs.

³⁰⁰ *Robinson* as discussed under “A brief history to the development of negligence liability” above.

³⁰¹ Indeed the argument was made in *Couch (No 1)* that a duty of care should be ruled out because of these difficulties. As the minority judgment put it in *Couch (No 1)* at [70], to deny a duty of care in the supervision of particularly dangerous people was to be cynical about the efficacy of supervision at all. The same might be said about denying a duty of care in making decisions about risk goods under the Biosecurity Act. The difficulties in the task will be relevant to whether a breach of the duty has occurred.

[424] The plaintiffs submit MAF's role is strongly analogous with that of the councils, and unlike that of the Building Industry Authority (BIA), in the building cases. The defendant submits the plaintiffs' reliance on the building inspection cases is misplaced. The Court of Appeal has described these cases as *sui generis* (of its own kind; in a class by itself; unique).³⁰² The defendant submits those cases arose out of the habitation interest people have in their homes, the reliance people acquiring a home place on a council, and the Building Act being premised on the assumption that private inspectors would have liability. He also submits that general reliance has not been recognised as sufficient outside of the building inspection cases.

[425] The last point does not reflect *Spencer on Byron* where it was said that reliance has less relevance outside negligent misstatement cases.³⁰³ The defendant is correct that the building cases have been described as *sui generis*. That is not to say they have no relevance if there is a close analogy.

[426] In the building cases the plaintiffs own the property directly impacted by the negligence if the property is constructed defectively. Although the law now views the loss as economic, rather than property damage, the loss is intimately tied to the property right. Indeed the defective construction sooner or later will likely lead to property damage (defective foundations lead to cracks and partial or total building collapses and leaky homes lead to mould and saturation which is ultimately likely to affect the building's soundness as well as affecting the health of its occupants).³⁰⁴ Similarly, kiwifruit orchardists who own the vines or their crop have property which is directly impacted if they are infected because risk goods, containing a pathogen, are used in the vicinity of their vines (from which the pathogen can spread). In contrast, the PHOs do not own the property directly affected by the negligence.

[427] The building cases have gone beyond the habitation interest people have in their home and extended to commercial buildings because it was considered there were no proper distinctions about the salient features that gave rise to the duty. That was so

³⁰² In *Attorney-General v Carter* at [35] Tipping J, for the Court, agreed with the submission of counsel for the second defendant that the "New Zealand building inspector cases are *sui generis*."

³⁰³ As discussed under "What reliance is placed on MAF?"

³⁰⁴ The loss is economic for timing reasons. Once the defects are discovered there is an economic loss to the owner because of the likely ultimate need to repair the defects to avoid the property damage (which affects the present value of the building).

even though, as William Young J’s dissenting judgment in *Spencer on Byron* pointed out, commercial building ownership is a business investment decision and protective contractual arrangements are potentially available as a cost of their investment. In light of this, it is difficult to see kiwifruit orchardists as less vulnerable and less in need of protection from the party charged with controlling the risk, than commercial property owners to whom councils owe a duty.

[428] I agree with the plaintiffs that MAF is more akin to the Council than the BIA. The BIA reported to the Minister and not the Council. Councils ensure compliance with the building code through the building consent, inspections and code of compliance process. This is a gatekeeper role not unlike MAF’s role in deciding on which goods may enter the country. MAF is less physically proximate to the plaintiffs. That is because MAF does not need to be physically proximate to undertake its gatekeeper role. The primary control of the risk is pre-border. An important aspect of this control is consultation with the relevant industry. Through this mechanism MAF is able to gain information directly from those potentially affected by the risks if the goods are permitted entry.³⁰⁵ At the post-border stage, MAF has physical proximity if it exercises its powers to eradicate or manage a risk which has materialised.

[429] For these reasons I consider the alleged duty of care under the first cause of action is supported by the New Zealand cases in relation to those who had “property rights” in the kiwifruit vines or crops affected by Psa3 (either because they were infected or because they were at risk of infection and were therefore treated as though they were infected). I consider the alleged duty of care under the first cause of action is not supported by the New Zealand cases for those who did not have “property rights” in the kiwifruit vines or crops affected by Psa3. As I go on to discuss in the next section, there are issues yet to consider about this. I am using the term “property rights” to cover all those who may have a sufficiently direct or closely associated interest in the vines or crop that the law will recognise.

[430] I next compare this case with the overseas biosecurity examples. The orchardists with property rights in the vines or crop have similar interests to the

³⁰⁵ As is discussed under the “Breach: first cause of action” part of the judgment, MAF did not carry out consultation prior to granting Kiwi Pollen its permits.

livestock owners in *Weller & Co* (to whom the court indicated a duty of care would be owed). Seeka as a PHO has a similar interest to the auctioneers in that case (to whom a duty of care was not owed). The nature of the Research Institute's negligence (bringing in a virus and negligently allowing it to escape) is broadly similar to the alleged negligence here (negligently assessing the risks associated with pollen and allowing the risks associated with the pollen to enter the country and escape).

[431] The livestock owners in *D Pride* with comparable interests to orchardists with property rights in the vines or crop were compensated by the government for the direct loss to their property. They also received compensation for consequential loss through the government support package and a settlement was reached with the Research Institutes. The case therefore does not point against a duty of care to the orchardists in this case. *D Pride* refused a duty of care to those who had suffered economic losses only. That was because there was no distinctive class. There are similar concerns here if a duty of care is owed to Seeka as a PHO. While *Perre* might support a duty to Seeka as a PHO, that case is not without its critics and this court is not bound by its conclusions.³⁰⁶

[432] The proximity between MAF and orchardists with "property rights" in the vines or crop is similar to *Sauer* although no final view was reached in that case. The proximity is less than the potato growers in *Givskud* (as the inspector had been asked to inspect the risk property and had not done so and the potato growers paid a levy to the government). It is possibly also less proximate than the potato growers in *Borrel* which also concerned the potato certification system. These cases do not strongly support the present claim, but nor do they weaken it.

[433] As discussed earlier, *Graham Barclay Oysters*, *Regent Holdings*, *Eliopoulos* and *Cromane* are not similar.

³⁰⁶ See *Todd on Torts* at 263; and BP Feldthusen "Pure Economic Loss in the High Court of Australia: Reinventing the Square Wheel?" (2000) 8 Tort L Rev 33.

If there is proximity, who is it with?

[434] I consider the plaintiffs have established proximity as between MAF and those in the Strathboss class, including Strathboss itself, who have “property rights” in the kiwifruit vines and their crops who were or were likely to be infected by Psa3 (or who were treated as though they were infected). I consider the plaintiffs have not established proximity in relation to Seeka in its capacity as PHO.

[435] I have not attempted to identify who within group 1 in the Strathboss class (owners and operators) will have “property rights” in the kiwifruit vines and their crops. Based on the submissions on Seeka’s leases this is not straightforward. More importantly I have not seen all the leases of those in the Strathboss class. This issue is not directly raised by the questions for this stage. It is better left for consideration when all the information is available and a full focus can be put on the issue.

Does the Act otherwise exclude a duty of care?

[436] The first question is whether the Biosecurity Act excludes private law remedies, and in particular claims for negligence. The Act has two provisions expressly concerning whether there may be claims for civil liability against the Crown or personnel acting under it.

[437] The first is s 163. This applies to “an inspector, authorised person, accredited person, or other person”. It excludes civil or criminal liability for acts or omissions in exercising functions, powers, or duties conferred on them under the Act unless that person’s act or omission was “in bad faith or without reasonable cause.” The first point about this is that it is premised on the basis that there can be civil or criminal liability against those persons. It limits civil or criminal liability to bad faith acts or omissions, or acts or omissions that were without reasonable cause.³⁰⁷ The second point is that the section does not say it applies to the Crown. The Act therefore does not expressly exclude a negligence claim against the Crown through this provision.

³⁰⁷ The plaintiffs submit “without reasonable cause” means civil liability for acts or omissions which were without “reasonable care”. The defendant disputes this. This is discussed in the “Crown immunity” part of this judgment. For present purposes this does not matter because the section on its terms does not apply to the Crown.

Whether it has the benefit of this provision, through the Crown Proceedings Act, is a separate question.³⁰⁸

[438] Section 164 is the other provision concerning whether there may be claims for civil liability against the Crown or personnel acting under the Act. In contrast with s 163, this section does apply expressly to “the Crown”. It provides the Crown is not under any civil liability for loss or damage to goods in certain circumstances. Those circumstances relate only to goods in the Crown’s custody or goods which have been treated, handled or quarantined.

[439] The Act therefore does not expressly exclude a claim for negligence against the Crown. The question is whether it does so because the Biosecurity Act, under which MAF’s powers are conferred, is inconsistent with the private law remedy (private duty to take care).³⁰⁹ As has been discussed earlier, the powers themselves are not inconsistent with a duty of care.³¹⁰ The defendant submits the compensation provisions in the Act are inconsistent with a private law remedy.

[440] More specifically the defendant submits the legislature has determined where the burden of realised biosecurity risks should be borne. He submits the Biosecurity Act has a carefully prescribed compensation regime. That regime marks the boundaries of public responsibility for the financial impact of biosecurity risks, subject only to extraordinary exceptions (for example, exercise of powers in bad faith). In other words, the defendant says the Biosecurity Act is premised on the idea of good faith management of biosecurity risks, and not with any form of warranty that no such risks will be realised. The Act has not provided for the type of remedy sought by the plaintiffs in this case and, to the contrary, it has provided the defence under s 163.

[441] In my view the question is not whether the Act has provided for the type of remedy sought by the plaintiffs. That is because the question is not whether an intention can be gathered to create a private law remedy from the provisions and

³⁰⁸ This is also discussed in the “Crown immunity” part of this judgment.

³⁰⁹ Refer to the “Public authorities” discussion above.

³¹⁰ Refer to the discussion under “Does the duty trespass into a non-justiciable or political sphere?” and “Is a duty of care inconsistent with the range of interests that must be considered under the Act?” above.

structure of the statute. It is whether the statute excludes a private law remedy.³¹¹ The compensation provisions must be considered in this light.

[442] There are the compensation provisions that relate to a pest management strategy. A pest management strategy is a strategy under Part 5 of the Act for the management and eradication of a particular pest or pests. A national pest management strategy is made by Order in Council on recommendation of the Minister.³¹² It may, amongst other things, require the destruction of goods, or prohibit their movement, in circumstances where the goods may contain or harbour a pest or otherwise pose a risk of spreading the pest.³¹³ The plan must, amongst other things, specify the basis “if any” on which compensation is to be paid “in respect of losses incurred as a direct result of the strategy”.³¹⁴ However a pest management strategy may not provide for compensation to a person for loss suffered “before the time when an inspector or authorised person establishes the presence of a pest on the premises of a person”.³¹⁵ A national pest management strategy imposes costs on the Crown “according to its tenor”.³¹⁶ By Order in Council the Minister may impose a levy to wholly or partially fund the implementation of a pest management strategy.³¹⁷

[443] In this case a national pest management plan was put in place in May 2013.³¹⁸ This was fast-tracked after the decision was made in February 2011 to phase out the strategy of cutting out green orchards under the Funding Agreement the industry had negotiated with the Crown.³¹⁹ Its primary objective was to reduce the harmful effects of Psa3 on economic well-being by preventing its spread and minimising its impact on kiwifruit production. Its secondary objectives included “to support the recovery of kiwifruit production ... by minimising overall production losses and enabling the successful establishment of new kiwifruit varieties”.³²⁰

³¹¹ As discussed under “Public authorities” above.

³¹² Biosecurity Act, s 68. There are also detailed provisions about how regional pest management strategies are made.

³¹³ Section 69B(1)(o) and (s).

³¹⁴ Section 69A(h) (national pest management strategy); s 76(1)(n) (regional pest strategy).

³¹⁵ Section 86(1)(c).

³¹⁶ Section 87(1).

³¹⁷ Section 90(1).

³¹⁸ Biosecurity (National Psa-V Pest Management Plan) Order 2013.

³¹⁹ Refer to “Part 2: Factual and regulatory background” of this judgment.

³²⁰ Biosecurity (National Psa-V Pest Management Plan) Order, s 6(2)(h).

[444] The draft plan made no provision for compensation. The reasons for this included that compensation could be extremely expensive (and would have to be paid for through a grower levy), it could create perverse incentives (such as leaving orchards to deteriorate), and it could create an avenue for some growers to exit the industry in a manner that increased the burden on the industry as a whole. The draft plan was the subject of consultation. Over 75 per cent of kiwifruit growers voted in favour of the plan with no provision for compensation.

[445] As the circumstances of this case show, compensation via this route is potentially funded by the industry and depends on the industry's views as a whole. It also applies only once the plan is in place.

[446] Next is s 162A of the Act. This provides for compensation when powers are exercised under the Act for the purpose of eradicating or managing an organism. It applies where those powers cause loss as a result of damage to or destruction of a person's property, or where restrictions are imposed on the movement or disposal of goods under Part 6 (which covers such matters as detaining or seizing goods, putting in place road blocks or declaring restricted or controlled places) or Part 7 (which is concerned with declaring biosecurity emergencies). The provision is time bound: a claim must be made within a year.

[447] The Primary Production Select Committee Report commentary of the provision said:³²¹

The new clause [which became s 162A] makes it clear when compensation may be payable and also sets out those situations where compensation will not be payable. ...

...The rationale for the government paying compensation is to encourage the reporting of unwanted organisms so that they can be eradicated. The level of compensation payments and the costs of eradication provide government with a strong incentive to commence eradication of a potentially damaging unwanted organism as soon as possible after its presence has been reported.

[448] Presumably, the provision also helps to incentivise ready compliance with the orders imposing restrictions on movements on and off properties and the destruction

³²¹ Biosecurity Amendment Bill (No 4) (216-2) (select committee report) at 510.

of goods. If people understand they have a statutory compensation right, they may be less inclined to offer some resistance to such orders.³²²

[449] The compensation under s 162A is limited to losses from the exercise of post-border powers. It is concerned with the exercise of powers once an unwanted organism is present in the country but only before a pest or pathway management plan is in place. As with a pest management strategy, the compensation does not apply to loss which has already occurred before the exercise of powers. Once a pest management plan is in place, if there is to be compensation at this stage, it is to be pursuant to that plan.³²³

[450] The defendant acknowledges there is no provision for compensation to be payable where the exercise (or not) of powers for other purposes has caused loss. Specifically, the defendant notes there is no compensation regime where the government has caused loss by issuing permits for a good or clearing a particular type of consignment. He submits that s 162(4)(b), which provides that “compensation must not be paid under this section ... in respect of a loss suffered before the time when the exercise of the powers commenced”, is a statutory exclusion addressed to the loss claimed.

[451] In my view, this provision is about when the Crown is obliged to pay compensation. It is intended to be comprehensive about the extent of compensation and the circumstances in which it will be paid when powers are exercised “for the purposes of the management and eradication of any organism”. It does not say anything about whether there is a private law remedy for loss suffered due to acts or omissions of MAF or MAF personnel which do not involve the exercise of such powers because the section is not about this.

³²² Murray Sherwin, the former Director-General of MAF, commented that there have been problems with this provision. For example, if MAF is spraying a large urban environment to manage or eradicate a pest, there can be a large number and variety of claims. Potentially this could impact on whether MAF would decide to use the powers under the Act.

³²³ Biosecurity Act, ss 69A(h) and 76(n).

[452] The only other provision purportedly dealing with compensation is s 117.³²⁴ That provision is entitled “Expenses and compensation”, however, it does not provide any compensation. It provides that the costs and expenses attendant on the custody and disposal of seized goods are payable by the owner of the goods or the person in possession of them before they were seized. This is subject to the discretion of the Director-General who may waive recovering these expenses.

[453] I therefore accept the defendant’s submission that Parliament has turned its mind to when there will be a statutory entitlement to compensation. Those provisions apply irrespective of how the pest came to be in New Zealand and whose fault that may have been. However, as the plaintiffs submit, the provisions are of narrow ambit. They do not address loss suffered as a result of MAF negligence in carrying out its biosecurity functions pre-border and at the border. I agree with the plaintiffs that the Act leaves this to be addressed through civil claims in negligence in the ordinary way if a claim can be made out, consistent with ss 163 and 164 which contemplate civil liability, but subject to their scope.³²⁵

This case: policy factors

Approach to policy factors

[454] As noted earlier,³²⁶ this second stage encompasses “a relatively small number of cases” in which a court would find no duty of care existed even though the loss was foreseeable and the relationship sufficiently proximate. The reason it is expressed in this way is explained by Tipping J in *Spencer on Byron* as follows:³²⁷

Once proximity is established a duty should be found to exist unless it would not be in the public interest to recognise the duty. In policy terms, the existence of proximity tilts the scales in favour of a duty. This is because, unless there is some sufficient countervailing policy factor, those who negligently cause loss to parties with whom they are in a proximate relationship should be required to compensate for that loss. If the loss is reasonably foreseeable and the parties are otherwise in a proximate relationship I do not consider it is just to deny the plaintiff a cause of action for loss negligently caused by the defendant unless the wider interests of

³²⁴ Other compensation provisions were repealed on 1 October 1998 (concerning damage to goods from biosecurity emergency and pest investigation powers).

³²⁵ Their scope is addressed in the “Crown immunity” part of this judgment.

³²⁶ Under “The methodology” section above.

³²⁷ *Spencer on Byron* at [54].

society mandate that denial. Any alternative approach would not give enough weight to the finding of proximity, and the *ex hypothesi* existence of negligently inflicted harm, in the ultimate question of whether it is reasonable to recognise the asserted duty of care.

[455] The defendant submits the pleaded duty gives rise to the longstanding judicial concerns about both indeterminate and disproportionate liability. He says the duty would expose the Crown to liability of an indeterminate amount, to an indeterminate class for an indeterminate time. He says if there was ever a case in which the spectre of unlimited liability compels a finding that there is no duty of care, it is this one. He notes these concerns have been important in other decisions in the Commonwealth in finding no duty of care in biosecurity cases.³²⁸

Indeterminate and disproportionate liability?

[456] One of the defendant's concerns is that the plaintiffs are said to be seeking to impose a duty of care in relation to the inputs that led to a change of policy regarding pollen imports. If a duty arises for negligent information gathering in the formulation of policy, taken to its logical conclusion there would be unlimited liability to an unlimited class.³²⁹ The duty alleged here is more specific than this. However the defendant says this is to advance a duty in a narrow "situational" (or backward looking) manner. The defendant says this cannot be considered without regard to the much broader duty implied by the plaintiffs' claims. He says that at its core, the grower plaintiffs' claim is one of liability for failure to protect their economic expectations against the adverse consequence of a biosecurity risk crossing the border and being realised. Such liability involves the potential indemnification of participants in any primary industry against such consequences, and thus quite enormous levels of damages. Without some limiting factor, liability is indeterminate as to class and amount.

[457] The defendant gave the hypothetical example of a foot and mouth incursion. If that arose from negligent actions of MAF personnel, the defendant says it is reasonably foreseeable it could cause loss to vast swathes of New Zealand. The scale

³²⁸ *Regent Holdings* (abalone virus), *Weller* (foot and mouth disease) and *D Pride* (foot and mouth disease).

³²⁹ Referring to *Adams v Borrell* at [73]; and *George v Newfoundland and Labrador* at [131].

of economic impact from a biosecurity incursion means that the class of persons who could possibly be affected, and the amount of loss, are indeterminate. In other words, if a duty of care is recognised in the present circumstances, it may be made out in similar circumstances as the present.

[458] The defendant also submits that part of the indeterminacy comes from the defendant's inability to control who might be affected by a pest or pathogen inadvertently imported with some good coming into New Zealand. He says MAF has no ability to determine the persons who might come into contact with the goods, or what their economic losses might be if the goods cause them damage.

[459] Further, liability could extend for an indeterminate amount of time. This is because of the difficulty of identifying and eradicating, or identifying and managing, pests and pathogens. In the case of Psa, there were many difficulties. For example, it was not possible to identify its presence immediately (the pathogen may be present without showing symptoms); at the beginning of the incursion there was no accurate and fast molecular test available to confirm whether a kiwifruit vine had Psa (let alone the particular Psa3 strain); and the pathogen could become resistant to treatment that initially suppressed it.

[460] These kinds of factors may mean that MAF has a limited ability to control the pathogen once there has been an incursion and damage caused by the pathogen could potentially continue on for years. Eradication and control difficulties are likely to arise in other biosecurity incursions. This gives rise to an indeterminacy of time over which damages can accrue and for which the Crown could be liable if a duty was imposed.

[461] I accept that, if a duty of care is imposed in this case, it would potentially apply to other biosecurity incursions for which MAF's negligence could be shown. If all the economic consequences of such incursions were to be shouldered by the Crown, this could give rise to very large damages claims. The defendant considers that if the plaintiffs' claim here succeeds in full, quite enormous levels of damages would be payable. It says the amounts claimed, for example, well surpass the entire 2009/10 appropriation for Vote Biosecurity (an amount of \$185.6m). Other incursions in other industries may give rise to even greater losses. On the face of it, this is a strong point

in the defendant's favour. There is no doubt biosecurity is a complex task and, if mistakes are made, there is the potential for significant harm and financial consequences.

[462] That said, biosecurity incursions have the potential to cause significant economic consequences for New Zealand even where they have arisen through no-one's fault. There was evidence that one significant pest present in this country arrived through natural forces.³³⁰ Regardless of the cause, the Government may be required to provide substantial compensation if it is in the public interest to order destruction of crops or livestock in order to eradicate or manage the incursion. As is the case with other disasters, the Government may also consider it to be in the public interest to offer some form of relief package. The Government did so in this case. That also appears to have been the case in some of the overseas biosecurity examples discussed earlier.

[463] But should the Government's response to biosecurity incursions (that is, whether to provide compensation and to what extent) be determined solely by the Government when a Crown Ministry has been negligent? Such an approach does not apply to private individuals or bodies who negligently cause loss. It may be appropriate for the Government, however, because the Ministry is performing a function in the public interest and the consequences of recognising a duty are too great. New Zealand's size relative to other countries (where large settlements may have been made) may mean the economic consequences are disproportionately severe. But this is to make assumptions. And if a duty of care is not recognised because of assumptions about the implications beyond this case, it denies compensation to parties harmed by the negligence who would otherwise be entitled to it.

[464] Importantly, negligence law has devices which restrict the scope of liability. A key device is the requirement for plaintiffs to show proximity for a duty of care to arise. It is not the case that negligent information gathering in formulating policy will necessarily give rise to liability. It will depend on the circumstances. It will not be

³³⁰ David Yard, the Psa-incursion response manager for MAF, said that myrtle rust was likely carried by environmental vectors (such as strong wind currents) to the New Zealand mainland based on the close correlation between wind events and the places where the pest is being found in New Zealand. He said that environmental conditions such as wind plumes, storm events, and cyclonic conditions are linked with the high level of spore formation in New Zealand.

the case that all New Zealand industries or businesses who suffer economic loss from the adverse consequences of a biosecurity risk crossing the border will be able to make a claim against MAF. Proximity is required.

[465] Proximity is an important controlling device as this case shows. It serves to narrow the class to whom a duty is owed. I have found that proximity is established only as between MAF and those who had “property rights” in the vines or crops infected with Psa3 or treated as though they were infected. Those who suffered losses because of their relationships or dependency on kiwifruit production, but who did not suffer direct loss because they did not have such “property rights” in the vines or crops, are not in a proximate relationship. As I have discussed, this is consistent with the overseas biosecurity examples. More importantly, it is consistent with New Zealand’s approach to a novel duty of care. Pure economic loss is a relevant factor in New Zealand when considering proximity in a novel situation. Those who suffered pure economic loss in this case were not sufficiently proximate to MAF when it was considering Kiwi Pollen’s permit application.

[466] Further, liability will not arise simply because a pest or pathogen has arrived in New Zealand with imported goods. A further limiting factor is that negligence would have to be shown. If the duty is upheld, that does not mean that all New Zealand industries or businesses who suffer economic loss from the adverse consequences of a biosecurity risk crossing the border will be able to make a claim against MAF. It would be necessary to prove that MAF had responsibility for the actions which led to the biosecurity risk crossing the border. For example, that the risk had not arrived through illegal smuggling or by natural forces such as the wind. It would also be necessary to show that MAF was negligent in the discharge of its responsibilities. For example, if an error has been made when MAF has followed its processes, conducted a risk assessment in accordance with those processes, and had reasonably relied on an accepted, established scientific view which later turns out to be wrong, it would be difficult to establish that MAF had been negligent.

[467] A further limiting device is the need to prove loss which has been caused by the negligence (and not some other cause) and that the loss is sufficiently proximate (the remoteness of damages question). That is, if a duty of care is owed, and it is breached and causes loss, there remains the issue of how far the legal responsibility for that loss ought to be attributed to the defendant. As Professor Todd puts it:³³¹

[The] object broadly is to ascertain whether the link between the defendant's conduct and the ensuing damage is such that it is reasonable as a matter of policy that the defendant should pay.

[468] These matters are not presently for consideration. However the point is that it is not necessarily a case of all or nothing. Some heads that are claimed may be too remotely connected to the direct harm from the Psa3 incursion for it to be reasonable that the burden for them be placed on the defendant. There are also mitigation obligations and betterment considerations to be factored in. In this case there is the interesting feature of the industry having taken control of the response to the incursion. Some orchardists have been compensated under those arrangements, some have been partly compensated and some have missed out altogether. In any case, those arrangements mean that some of the potentially recoverable loss has already been paid.

[469] The defendant submits a duty of care will create disproportion between MAF personnel carelessness and the loss suffered by the plaintiffs. He says that here the allegations of negligence come down to: a) MAF personnel not being sufficiently alive to the risks posed by kiwifruit pollen when deciding to grant an import permit for kiwifruit pollen; and b) paying insufficient attention to the June 2009 anthers consignment imported by Kiwi Pollen. He submits the breaches are not of the magnitude that means the Crown should be held liable for the economic consequences of the Psa3 incursion.

[470] However a moment's inattention when driving a car can cause the loss of lives. A match dropped in the wrong place may cause an explosion with significant property damage and consequential financial losses resulting. Carelessness in reading a map when navigating a boat loaded with oil and other cargo may cause significant environmental damage. In other words, concerns about the magnitude of the

³³¹ *Todd on Torts* at 1132.

consequences relative to the activity undertaken are not unique to biosecurity. And, as already discussed, there are a number of reasons why the Crown will not be liable for the full economic consequences of the Psa3 incursion.

[471] One of the cases the defendant's submissions relied on regarding disproportionate liability was the Court of Appeal's decision in *Invercargill City Council v Southland Indoor Leisure Centre*.³³² In that case, the Council was sued in negligence for issuing a code compliance statement for remediation to the roof of a stadium when the roof subsequently collapsed following a snowstorm. The Court of Appeal reversed the High Court's finding that the Council was liable. The majority judgment said:³³³

... a balance is required between the plaintiff's claim for compensation for avoidable harm and the defendant's claim to be protected from an undue burden of legal responsibility. This factor is of particular concern where a finding of liability will create disproportion between the defendant's negligence and the plaintiff's form of loss.

This case starkly illustrates the possible extent of such disproportionality. For an entitlement to charge relatively nominal fees, the Council has been visited with liability for more than \$16 million. The effect of the High Court judgment is that the Council has warranted or underwritten the cost of remedying the damage created by the negligence of the Trust's agents.

[472] An appeal to the Supreme Court in *Southland Indoor Leisure Centre* was pending when the parties in the present case were giving their closing submissions. The Supreme Court subsequently delivered their decision overturning the Court of Appeal's decision.³³⁴ They did so on the basis it was not distinguishable from *Spencer on Byron*. In doing so, they expressed no concern about disproportionality. A majority of the Supreme Court did, however, reduce the Council's liability by 50 per cent for the contributory negligence on the part of the building owner. Contributory negligence, where applicable, is another way that large negligence claims may be reduced.

³³² *Invercargill City Council v Southland Indoor Leisure Centre* [2017] NZCA 68.

³³³ At [193]-[194] per Harrison J (Cooper J concurring).

³³⁴ Such concerns had not displaced a Council's duty of care in the building cases such as *Spencer on Byron* and those before it.

[473] An important feature in the building cases has been the assumed ability of the Council to bear and spread the loss. As it was put by Tipping J in *Spencer on Byron*:³³⁵

It is a respectable function of tort law, in appropriate circumstances, to facilitate loss-spreading. If a council through its negligence causes a building owner loss, the economic consequences for the council can surely be managed at least in part through fees and insurance.

[474] Whether the Crown had insurance for this claim became an issue in the course of cross-examination of MAF witnesses. The Crown was required to provide discovery on this issue to correct the position which mistakenly was put forward at this time.³³⁶ It transpired that MAF held a Professional Indemnity/General Liability policy and a further General Liability policy which potentially covered a considerable sum towards this liability, although not all of the sums claimed by the plaintiffs.³³⁷ In this particular case therefore the New Zealand public will not necessarily bear all of the costs of a damages award. The public have borne the cost of the premium and will bear the difference between the damages ultimately awarded and the amount of insurance available.

[475] However, the way in which this issue arose meant that I do not have any detailed evidence about the scope, cost and availability of insurance for the negligent exercise of (or failures to exercise) biosecurity functions, powers of duties. This means I do not know whether insurance will be available to spread losses if a duty of care in this case leads to other claims of negligence for other biosecurity failures.

[476] I am able to infer that the plaintiffs in this case did not have relevant insurance. This is because the plaintiffs were asked pre-trial to discover their insurance arrangements but there were none to discover. However I do not have evidence about the scope, cost and availability of insurance for orchardists or other businesses affected by biosecurity breaches beyond this.

³³⁵ *Spencer on Byron* at [52].

³³⁶ *Strathboss Kiwifruit Ltd v Attorney-General* [2017] NZHC 2512 (Ruling of Mallon J on insurance issue).

³³⁷ The Crown described it as a “modest fraction”. However this is only an accurate description if the full amounts claimed are recoverable. That is yet to be determined. I have held that the Crown does not have liability for the \$92.5 million claimed by Seeka in its capacity as a PHO for example.

[477] In these circumstances it would be unsafe to make any assumptions about the availability of insurance for liability for biosecurity risks in future cases. Further, the availability of insurance enables a defendant to bear the risks of liability. As the defendant submitted when it opposed discovery of its insurance cover, the Crown will always meet any judgment against it. I therefore consider the possibility of insurance to be neutral in assessing whether policy considerations negative a duty of care.

[478] When liability is imposed on the Crown for negligence by Crown employees, the cost is ultimately borne by the public through taxes. The taxes pay for insurance policies if available. The public pay the liability more directly if insurance is not available. The question then is whether it is disproportionate for the New Zealand public (ultimately) to bear those costs when public servants make a one-off small error in the exercise of their public functions. The defendant submits that the public of New Zealand should not become the insurer or guarantor of losses which are suffered by particular persons or industries. Public authorities exercising regulatory functions must deal with the world at large. The regulator, by and large, regulates for the very purpose of protecting the general public. The same point, however, applies to councils in the building cases. Ultimately there is a societal benefit from corrective justice. If a person is harmed by the negligence of a government body, it is in society's interests that the government restores the harm they have caused, unless there is a sufficiently countervailing public interest.

[479] Importantly, it is difficult to make accurate predictions about the future. What is clear is that biosecurity is in the national interest.³³⁸ The Government Industry Agreement model of funding biosecurity responses, on which the funding agreement was based, represents a shared and collaborative approach to biosecurity as between the government and industries. It may be that further thinking and policy analysis around how best to protect our borders will lead to new, more efficient and effective, mechanisms for allocating the costs of biosecurity protection and the response to biosecurity breaches.

³³⁸ As discussed in more detail in "Part 2: Factual and regulatory background".

[480] For these reasons I am not persuaded that generalised concerns about indeterminate and disproportionate liability provide a sufficiently countervailing interest to displace the corrective justice interest in this case. Are there other policy reasons to do so?

Availability of other/more appropriate accountability mechanisms?

[481] One reason advanced by the defendant is that tort liability is not necessary to ensure public accountability. The defendant refers to the public law framework for accountability³³⁹ and ongoing improvement of public decision-making.

[482] In addition to Parliamentary accountability, a principal feature of that framework is the judicial review jurisdiction. This serves to ensure legality, including adherence to relevant processes, and rationality, so that decisions involving public powers are exercised as intended. Judicial review remedies have always excluded damages payable to private individuals. Among other things, this serves to encourage candour in public authorities explaining to the Court their reasoning and to set standards for future decision-making.

[483] It is accepted that there are accountability mechanisms, other than a private law duty of care, for when mistakes are made by those exercising powers or functions under the Biosecurity Act. Those accountability mechanisms may help to ensure proper and lawful decisions are made. If, for example, MAF had unreasonably declined to issue a permit to Kiwi Pollen (by, for example, failing to consider any scientific information about biosecurity risks arising with pollen but assuming without any reasonable basis that serious risks arose), Kiwi Pollen could apply for judicial review. Conceivably the countries from where the pollen was to be imported could make a complaint under the SPS Agreement processes. But where MAF has unreasonably issued a permit (on the basis of, for example, a scientific review which was for a different use of pollen than that to which the permit related and this different purpose was relevant to the risks), the plaintiffs have no remedy.³⁴⁰

³³⁹ In addition to the framework discussed above (“This case: the statutory context”), the Ombudsman and Auditor-General have oversight roles.

³⁴⁰ The defendant refers to the possibility of a declaratory judgment claim. However, that would be of no assistance to the plaintiffs where they did not know the import permit for pollen had been granted before the incursion occurred. The defendant submits it is significant that the plaintiffs

[484] This was a factor which the minority reasoning in *Couch (No 1)* considered relevant. They considered the vulnerability of members of the public, whom the Probation Service had a statutory purpose to protect, and for whom there was no public law remedy if they were injured by the careless discharge of the Probation Service's statutory function, supported a duty of care.³⁴¹

[485] The Law Commission touches on this in its report reviewing Crown immunity.³⁴² In the context of discussing whether Government employees should be protected from personal liability via an indemnity rather than an immunity, it comments:³⁴³

While there is no doubt that accountability arrangements within government departments now do much of the work that may have previously been done by exposure to liability, it should be recognised that sometimes these systems will fail. The existence of these alternative accountabilities does not therefore fully answer the question of whether Crown employees should face the further scrutiny of being personally liable.

[486] The same point can be made about whether the Crown (as distinct from Crown employees) should be subject to a private law duty of care despite the other accountability arrangements that exist. A private law duty of care does not cut across these other avenues. Nor has it been said that they would interfere in some way with the statutory compensation provisions. As has been seen in other jurisdictions, compensation may be paid under legislation or through voluntary initiatives but civil claims may fill the gap left by those mechanisms.

[487] In addition to Parliamentary accountability and judicial review providing some incentive for and oversight of the proper discharge of statutory powers, formal reviews are not infrequently undertaken when things have gone wrong. In certain cases, for example, there may be a formal commission of inquiry.³⁴⁴ Or, a Minister and/or chief

cannot make out a claim for breach of a statutory duty or public misfeasance in office. I do not agree. These are separate torts which sit alongside a common law negligence claim.

³⁴¹ *Couch (No 1)* at [70]. The majority judgment does not discuss this point.

³⁴² Law Commission *A New Crown Civil Proceedings Act for New Zealand* (NZLC R135, December 2015) [*A New Crown Civil Proceedings Act for New Zealand*]. This report is referred to in the Crown immunity part of this judgment.

³⁴³ At [3.80].

³⁴⁴ Inquiries Act 2013, s 27. See also *Re Erebus Royal Commission; Air New Zealand Ltd v Mahon (No 2)* [1981] 1 NZLR 618 (CA) at 653. As an example of this outside the present case, the defendant refers to *Clasul Pty Ltd v Commonwealth of Australia* [2016] FCA 1119, where Foster J approved settlement (on the basis the Commonwealth would pay nothing) of a class action

executive may commission an “after the event” inquiry by an external party. The primary purpose is to identify (with hindsight) any shortcomings so that future decision-making is improved. The defendant submits this is a positive step which will be avoided if (as here) the exercise becomes a platform for private claims for extensive damages.³⁴⁵ Here MAF believes the independent report it commissioned (the Sapere Report) was the platform on which this proceeding was brought.

[488] I am not persuaded by this point. It is not borne out by the facts. MAF made its Pathway Tracing report available to the industry. It was aware some industry participants believed imported pollen, approved by MAF, had caused the Psa3 outbreak and were dissatisfied with the report. This led to MAF commissioning the Sapere Report. In commissioning that report MAF was displaying the kind of good governance to be expected of a ministry of the Government. The Government acts for the benefit of the public. It is to the benefit of the public to determine the cause of events which have had serious ramifications for people in our society. From such reviews, learnings are gained so that similar mistakes in the future may be avoided. The MAF witnesses who gave evidence before me were very much of this ethos. The Sapere Report was regarded by them as providing helpful guidance for the future. Indeed the court process was viewed by the MAF witnesses in the same vein.

What about deterrence or risk averse behaviour?

[489] A related point is whether a private law duty has a role to play in deterring future mistakes. If the Government can be expected to respond to mistakes of its own volition, a private law duty is unnecessary for deterrence. There is also an argument that deterrence may lead to decisions which are unduly risk averse (in the sense of

brought against the Commonwealth in negligence for the escape of equine influenza from a Quarantine Station. The equine influenza outbreak was the subject of a commission of inquiry, conducted at the request of the Minister for Agriculture, Fisheries and Forestry in September 2007. The Report of the Equine Influenza Inquiry was released in April 2008 (Hon Ian Callinan AC conducted the Inquiry). The first applicant in the *Clasul* case commenced proceedings in August 2009.

³⁴⁵ Murray Sherwin, the Director-General and Chief Executive of MAF at the relevant time, gave evidence confirming that external reports can be very useful exercises to identify where an organisation’s strengths lie but crucially which areas can be improved and how. He said that, to be effective, it is important that such reports are produced in the model of free and frank advice. If reports assign blame or liability, that undermines an organisation’s willingness to open itself to critical review in the interests of performance improvement and can be highly damaging long-term.

erring on the side of a decision that will not expose the Government to a private law action) when the duty is to make a decision without fear or favour.

[490] This point is made in *Attorney-General v Carter*, where the plaintiffs claimed that the Ministry of Transport had negligently issued survey certificates for a ship.³⁴⁶ The Court of Appeal held no common law duty in negligence was owed by the Ministry.³⁴⁷ Tipping J (for the Court) said:³⁴⁸

There is a legitimate public interest in regulatory bodies being free to perform their role without the chilling effect of undue vulnerability to actions for negligence. Whether it be a case of failing to issue or of issuing a certificate, the threat of legal liability for economic loss might subject the survey authority to inappropriate pressures to the detriment of the overall public interest.

[491] The Law Commission's report also touches on this point. In the context of considering whether employees ought to be protected from personal liability via an indemnity rather than an immunity, the Law Commission commented:³⁴⁹

... Crown employees serve the government of the day, which means they are required to implement government policy and their ministers' lawful instructions, regardless of their personal views.

Crown employees sometimes must exercise substantial powers or comply with onerous duties requiring them to make decisions that are difficult and likely to significantly affect and possibly aggrieve individuals. Often, there are competing interests being weighed up, so opposition is likely whatever decision is made. ...

Submitters argued that, if Crown employees are exposed to the threat of liability, this could lead to these employees conducting their work in an overly cautious or risk-averse way. Crown employees should not be unduly influenced by the fear of personal suit. Without immunity, they could be overly defensive. ...

...

It is very hard to determine what, if any, weight should be given to the argument from either side about the chilling effect exposure to litigation has on any individual's decision making and actions. It seems likely that it is somewhat overstated ... The influence of potential litigation is, in our view,

³⁴⁶ *Attorney-General v Carter*.

³⁴⁷ As Tipping J explained at [34], there was a more fundamental problem with the plaintiffs which was that "the purpose of the certificate was entirely different from the purpose for which the plaintiffs claim to be entitled to place reliance on it".

³⁴⁸ At [35]. Tipping J went on to explain that it was, at [34]-[35]: "For this kind of reason the trend of authority is not to hold the regulator liable to the regulated for economic loss, even if negligence can be shown ... [and] the New Zealand building inspector cases are sui generis."

³⁴⁹ *A New Crown Civil Proceedings Act for New Zealand* at [3.69]-[3.76].

likely to be relatively remote. In the modern public sector, there are much more immediate and relevant levers, such as employment sanctions or rewards, for imposing accountability and managing individual responsibility.

[492] Those comments are, in my respectful view, sound. MAF personnel can be expected to make the decisions they are tasked with, without fear or favour. While any potential exposure to litigation might create incentives to be overly risk averse when deciding when risk goods may be imported it is likely to be matched by the other pressures at play: from the particular importer and exporter of the goods at issue, the interests of importers generally, the interest of New Zealand exporters in open markets, the interests of the exporting country and the interests of New Zealand to comply with and to be seen to comply with international obligations. Moreover, MAF processes are designed to ensure the decisions are made for the right reasons.

[493] Similarly, in deciding whether a duty of care should be imposed in this case, individual deterrence is not a factor to which I give any weight. I accept that the public service can be expected to respond to mistakes and improve their processes for the future, regardless of the threat of litigation. That was certainly the MAF witnesses' approach in this case. They were an impressive group of witnesses.

[494] That said, while the Government does not need a private law duty to be encouraged to make improvements, a private law duty is not inconsistent with such encouragement. It may even be that in some cases a private law duty will provide a greater focus on the issue that has occurred and therefore help to ensure that the Government response for the future is adequate.³⁵⁰ This is an unknown here. For present purposes the point is that it is not a policy factor which negates a duty of care.

This case: is a duty of care fair, just and reasonable

[495] I have concluded the features in this case support a duty of care to those who have "property rights" in the crop or vines which were infected with Psa3 or treated as though they were infected. In summary those features are:

³⁵⁰ Geoff McLay "Torts, Settlements and Government: A preliminary inquiry" (2011) 9 *New Zealand Journal of Public and International Law* 247. This article considers the government's response to threatened litigation in the context of the collapse of the viewing platform at Cave Creek, Ministry of Health settlements for contaminated blood and settlements of institutional child abuse.

- (a) They have suffered property damage (to their vines and crops) from harm directly caused to their property.
- (b) The harm suffered was from a risk (a harmful kiwifruit pathogen) over which they had no control and for which they had to rely on MAF for protection.
- (c) MAF had responsibility for controlling that risk and had powers to control the entry of the risk goods into New Zealand (both pre-border and at the border) as well as powers for responding to the risk from a harmful plant pathogen once it learns of its presence in New Zealand.
- (d) The particular risk in this case, Psa in kiwifruit plant material, was known to MAF.
- (e) It was obvious that if kiwifruit plant material was allowed to be imported without a proper assessment of the conditions on which it could be imported and, if that plant material was intended to be applied to kiwifruit orchards, the vines and crops on those orchards were at risk of harm.
- (f) It was also obvious that if pollen was not free of plant material or other contaminants and was to be used commercially to artificially pollinate kiwifruit orchards, the vines and crops of those orchards were at risk of harm.

[496] Proximity is therefore established and a duty of care should be found to exist unless it would not be in the public interest to recognise the duty. The countervailing policy factors in this case are not sufficient to negate the duty because:

- (a) Concerns about indeterminate and disproportionate liability if a duty of care is recognised in this case make assumptions about the consequences that will follow. The elements of negligence involve inquiries that work

together and serve to restrict its application to proper cases and within proper limits.

- (b) If a duty of care is imposed, the costs will ultimately be borne by the New Zealand public, through taxes which will pay for insurance to the extent it is available or more directly if it is not. There is, however, a societal benefit if members of the New Zealand public who have suffered loss from the negligence of a government body receive compensation for that loss.
- (c) The protection of New Zealand's border is in the national interest. New Zealand government bodies and industries have an interest in working together to find an efficient and effective means to protect the border and to allocate the costs of that protection and the responses to biosecurity breaches when they happen.
- (d) The existing accountability mechanisms that help to ensure careful and proper biosecurity decisions are made leave unfilled gaps. They did not protect the plaintiffs.
- (e) A duty of care is not likely to create overly risk averse behaviour by public servants with biosecurity responsibilities because of the range of other interests that are involved.

[497] In all the circumstances it is just, fair and reasonable that MAF has a duty of care to those within the class represented by Strathboss who have suffered loss to their property. The wrong to them should be remedied.

[498] I have reached a different view in relation to Seeka's claim as a post-harvest operator. It has suffered loss because of its business relationships with growers. That is relational economic loss. It is different in kind to property damage and more removed from the immediate consequences of the alleged negligence in this case. This means that the connection between Seeka and MAF is less close. Seeka's losses are not of a kind that are sufficiently distinct from others who suffered economic losses in

some way because orchard production was affected by Psa. There are also issues about whether it is more appropriate that Seeka bear losses arising from adverse events in kiwifruit production whatever their cause than the government and ultimately the New Zealand public. Therefore I have not been persuaded that it is just, fair and reasonable for MAF to owe a duty of care to Seeka as a post-harvest operator.

[499] I have left for determination at stage two of this case who in the Strathboss class falls within the group to whom the duty is owed. Those within the Strathboss class will have to show they had property rights in the vines and crops or that their interest in the vines and crops is sufficiently direct or closely associated with those rights that they should be treated as though they have suffered loss to their property. The duty of care applies to consequential financial losses of those that are in that class but will be subject to the limits of causation, remoteness, mitigation and betterment.

Part 4: Breach – first cause of action

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Introduction

[500] This part of the judgment concerns MAF’s alleged negligence in permitting Kiwi Pollen to import pollen from China. It relates to the first cause of action. It does not concern MAF’s alleged negligence at the border which is the second cause of action.

Overview

[501] To import pollen into New Zealand a permit from MAF was necessary. Kiwi Pollen’s first enquiry of MAF about obtaining a permit to import kiwifruit pollen coincided with a review that was underway at MAF about the conditions on which pollen imports should be approved. MAF had carried out a risk analysis for *Actinidia* cuttings and plants in tissue culture, but not for kiwifruit pollen or any pollen.

[502] MAF’s approach had been to require all pollen imports (that is, not confined to kiwifruit) to go into a post-entry quarantine (PEQ) facility, pollinate the mother plant and to test the seed from that plant for pests and diseases. That approach treated pollen consistently with other nursery stock, such as budwood and plant tissue, which under the Nursery Stock Import Health Standard (IHS) were required to go into PEQ.³⁵¹ However, unlike other nursery stock, the IHS did not specifically require this and it was unclear if the risks associated with pollen warranted this. Consideration was given to changing this approach.

[503] As part of this process the PHEL³⁵² carried out a review of pests and diseases transmitted by pollen (the PHEL Review), a later version of which (the Card Paper) was published in a scientific journal. The PHEL Review stated: “There are no known bacteria or mollicutes that are pollen transmitted (Nemeth, 1986b)”. The Card Paper, similarly, stated: “There are no pollen-transmitted bacteria ...”.

[504] Following Kiwi Pollen’s initial enquiry of MAF, it made its first application for a permit. This was to import kiwifruit pollen from China. The application

³⁵¹ Discussed in more detail under “Part 2: Factual and regulatory background” of this judgment.

³⁵² Plant Health Environment Laboratory (PHEL). PHEL is a part of the Investigation and Diagnostic Centre (or IDC) which also comprises the Incursion Investigators Team and Quality Safety and Support Group.

coincided with the completion of the PHEL Review. Kiwi Pollen's application was approved without a requirement for PEQ. No consultation had taken place with industry as part of the PHEL Review, nor before it, about the risks associated with Kiwi Pollen's import permit application.

[505] The conditions on which Kiwi Pollen's permit was issued were limited to the following requirement:

Only hand collected, unopened male flower buds may be collected, milled and imported.

Consignments must be accompanied by a government issued phytosanitary certificate stating that the male flower buds were hand collected and unopened.

[506] That first permit was not used. Further kiwifruit pollen import requests were made by Kiwi Pollen and approved by MAF. These were for imports from China and Chile. No further assessment of the risks of pathogens associated with pollen were made by MAF before these permits were issued. Nor did MAF undertake consultation about the risks. During this time the conditions of the permit changed to state:

1. Unopened male flower buds must be hand collected. The pollen may be milled prior to import.
2. All consignments must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation of the exporting country with the following Additional Declaration

[507] Pursuant to one of those permits a shipment from China of anthers (the part of the flower from which pollen is obtained) was received by Kiwi Pollen shortly after it was cleared at the New Zealand border on 30 June 2009. The plaintiffs say it was this shipment which caused the Psa incursion.

[508] In the meantime Psa was having devastating effects in Italy. By mid to late 2010 there were concerns about Italian kiwifruit imports into New Zealand and importers voluntarily decided to halt imports. In September 2010 Dr Vanneste advised MAF of his preliminary conclusions suggesting an association between Psa and pollen. Following further industry communications with MAF, on 4 November 2010 it agreed to review the import health standards for Psa. However, on 5 November

2010 MAF received the news that samples from a kiwifruit orchard in Te Puke had been tested and the preliminary results were that it was Psa.

[509] The plaintiffs allege the evidence establishes the following breaches of duty:

- (a) The authors of the PHEL Review (Dr Stuart Card and Dr Gerard Clover) were negligent in concluding there were no pollen transmitted bacteria.
- (b) Dr Gerard Clover was negligent in failing to advise the plant imports team that the PHEL Review did not assess the risks of milled pollen used for artificial pollination.
- (c) Members of the plant imports team, including Susan Cooper, Wayne Hartley and Dr Shiroma Sathyapala from MAF's risk analysis team were negligent in deciding to grant Kiwi Pollen's request to import kiwifruit pollen.
- (d) Members of the plant imports team, including Michele Dickson, Chris Baring and Mr Hartley, were negligent in omitting the condition requiring microscopic inspection from the import permits issued to Kiwi Pollen.
- (e) Members of the plant imports team, including Ms Tamsin Hains, and either Alice Ormond or Vivian Campbell, were negligent in changing the wording of Kiwi Pollen's import permits.
- (f) Members of the risk analysis team, including Dr Sathyapala, were negligent in failing to consider the risk posed by kiwifruit pollen imports following the Italian outbreak of Psa3.

[510] A chronology of the key events are as follows:

Date	Event
5 November 1999	MAF prepares Psa country freedom report recording that Psa is present in Italy and Japan, and that transmission is via infected plant material (less likely on fresh fruit and unlikely on seed).
14 August 2003	MAF completes a pest risk analysis for Psa (among other <i>Actinidia</i> pests) as part of Dr Clover's review of the <i>Actinidia</i> Schedule to the Nursery Stock IHS.
17 March 2004	MAF consults with key stakeholders on the draft <i>Actinidia</i> Schedule (submissions received from HortResearch and Zespri) and makes changes following this.
28 May 2004	<i>Actinidia</i> Schedule added to Nursery Stock IHS.
2004 – 2006	During this period MAF's approach to proposed pollen imports is that they were to go into a PEQ facility for pollination of mother plant and testing of resulting seed.
12 April 2006	MAF's Risk Analysis Procedures signed off (prepared by Dr Mike Ormsby).
18 July 2006	Dr Stuart Card employed and starts PHEL Review of pests and diseases transmitted by pollen under Dr Clover's supervision.
18 August 2006	<i>Actinidia</i> PEQ Manual finalised and <i>Actinidia</i> Schedule of the Nursery Stock IHS amended to update testing requirements for Psa.
29 August 2006	MAF meeting (Dr Herrera, Dr Sathyapala, Ms Cooper) to discuss pollen imports requirements. Decided that PHEL would review pests and diseases transmitted by pollen (not limited to <i>Actinidia</i>) (the PHEL Review) and would be peer reviewed, IHS would be amended to require microscopic inspection and pollen would be imported into "TF + pollination + testing".
29 September 2006	Dr Clover sends draft PHEL to Dr Pearson (external reviewer), Ms Hains and Dr Fernando (internal reviews) for peer review.
22 November 2006	Draft PHEL Review is finalised and Dr Clover saves it onto internal MAF database.
23 November 2006	Kiwi Pollen (Jill Hamlyn) enquires about importing pollen from Italy and China.
6 December 2006	Ms Dickson contacts Dr Clover and receives his reply providing the PHEL Review and stating "there are no pests or diseases known to be associated with pollen of <i>Actinidia</i> spp".
8 December 2006	MAF approves Kiwi Pollen request and advises Kiwi Pollen of approval with the request that it be "hand collected, unopened male flower buds of kiwifruit may be collected, milled and imported".
12 December 2006	MAF (Ms Dickson) sends a further email to Kiwi Pollen with microscopic inspection requirement.
28 February 2007	Another party submits application form for <i>Pyrus</i> (pear) and <i>Malus</i> (apple) pollen.
20 March 2007	Kiwi Pollen is told that Chris Baring would take over preparation of the permits.
28 March 2007	Communications between Dr Sathyapala and Dr Clover following further peer review of PHEL Review.
29 March 2007	Kiwi Pollen faxes to MAF (Mr Baring) an application to import kiwifruit pollen.
	The manuscript of the PHEL Review (the Card Paper) submitted to Plant Pathology.
16 April 2007	First Kiwi Pollen permit from China. Issued by MAF (prepared by Mr Baring, peer reviewed by Mr Hartley and authorised by Ms Cooper and peer reviewed by Mr Hartley). Conditions: Only hand collected, unopened male flower buds may be collected, milled and imported. Consignments must be accompanied by a government issued phytosanitary certificate stating that the male flower buds were hand collected and unopened. This permit was not used.

Date	Event
26 April 2007	Mr Baring responds to enquiry about <i>Pyrus</i> pollen advising that only pollen from hand-picked unopened flowers may be imported. <i>Malus</i> pollen has viruses associated, so would need additional measures.
7 May 2007	HortResearch permits for <i>Pyrus</i> pollen issued, with conditions requiring collection from hand-picked closed buds and a phytosanitary certificate.
17 May 2007	Card Paper manuscript rejected by Plant Pathology.
17 May 2007	Kiwi Pollen emails MAF (Mr Baring and Mr Hartley) requesting a meeting to discuss importing vacuum collected pollen.
28-30 May 2007	MAF (Mr Baring) advises Kiwi Pollen that proposal to import vacuum-milling proposal cannot proceed without a formal risk assessment by RAG.
5-6 September 2007	MAF (Mr Baring) advises Kiwi Pollen that they are unable to proceed with importing vacuum collected pollen without further information.
September 2007	Card Paper published.
7 December 2007	Further permit granted to Kiwi Pollen to import pollen from Chile. The permit is not used.
3 November 2008	Wording change to Kiwi Pollen pollen imports occurs: Permit is to import pollen from Chile. Issued by Ms Hains. Conditions: Unopened male flower buds must be hand collected. The pollen may be milled prior to import. All consignments must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation of the exporting country with the following Additional Declaration: "The male flower buds were hand collected and unopened". The permit is used: shipment arrived 15/12/08 and 28/03/09
February – March 2009	Zespri Global Supply arrange for Dr Vanneste (Plant & Food) to travel to Italy to visit orchards because of the Italian Psa outbreak. Confirmed as Psa.
30 April 2009	Permits for Kiwi Pollen to import pollen from China and Chile. Issued by Bryan Rose and peer reviewed by Ms Campbell. Both contain the 3 Nov 2008 wording change to the conditions. 1. Unopened male flower buds must be hand collected. 2. The pollen may be milled prior to import. All consignments must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation of the exporting country with the following Additional Declaration: "The male flower buds were hand collected and unopened". The permit for China is used (shipment of 4.5 kg of anthers arrived 24/06/09). (The permit for Chile is not used.)
30 June 2009	MAF clears consignment of kiwifruit pollen from China.
3 October 2009	Further permit to Kiwi Pollen to import pollen from Chile. Issued by Bryan Rose. Same conditions as 3 Nov 2008 and 30 April permits. Permit is used: shipments arrived 28/11/09 and 30/04/10.
December 2009	EPPO (Nov 2009) alert circulated and MAF conducts priority review of nursery stock import pathways.
9-12 April 2010	MAF (Dr Jo Berry) conducts a priority pest risk analysis on Psa. Pollen is not identified as a pathway. Cites a November 2009 EPPO alert that Psa was present in China.
17 May 2010	Dr Everett emails MAF about Psa asking whether the Nursery Stock IHS should be re-examined.
8-9 June 2010	Kiwi Pollen applies for and is granted a permit to import kiwifruit pollen from China. Issuing officer: Bryan Rose. Conditions: Unopened male flower buds must be hand collected. The pollen may be milled prior to import. All consignments must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation of the exporting country with the following Additional Declaration: "The male flower buds were hand collected and unopened". Permit is used: shipment arrived 6 June 2010 and released by MAF on 16 June 2010 This is the second shipment from China.

Date	Event
23 June 2010	Dr Sathyapala replies to Dr Everett stating that MAF would need published evidence of Psa transmission on fruit to impose measures.
23 July 2010	Zespri requests a meeting with MAF to discuss banning fruit imports from Italy.
17-20 August 2010	Plant & Food notifies MAF that Dr Vanneste is conducting research on Psa survival on fruit.
30 September 2010	Plant & Food provides Dr Vanneste's preliminary conclusions to MAF suggesting an association between Psa and pollen.
7 and 22 October 2010	Zespri requests MAF impose provisional measures on Italian kiwifruit.
4 November 2010	MAF agrees to review import health requirements for Psa.
5 November 2010	Presence of Psa in Te Puke notified to MAF.
12 November 2010	MAF decides to halt pollen imports.

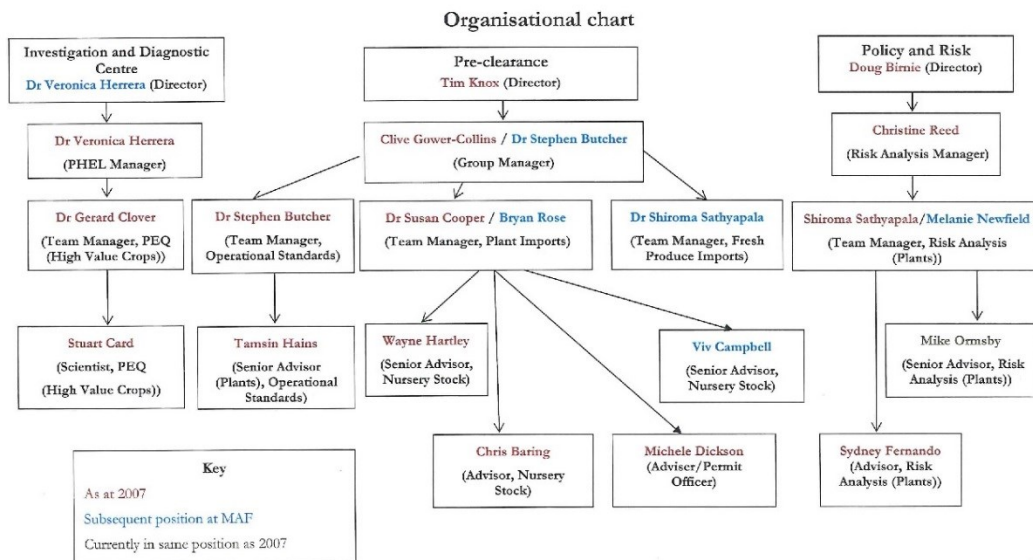
Pink = Kiwi Pollen/MAF permit interactions.

Blue = PHEL Review matters.

White = Other background.

Personnel

[511] The following chart identifies the positions of the key personnel and who they reported to that are relevant to this part of the case.



The law

[512] Negligence is the failure to take reasonable care. What that standard involves depends on what the person is doing and the particular circumstances in which it is being done. A person with special skill and knowledge who is acting in that capacity is required to employ the reasonable skill and knowledge of someone in the position of the defendant. It is an objective test determined by the Court on the facts. It is

determined on the facts as they existed at the time and not with the benefit of hindsight bias.

[513] Where an exercise of judgment is required, an error in making that judgment does not amount to a failure to take reasonable care if the defendant's conduct measured up to proper standards, yet the course he or she took turned out to be mistaken. The point is that a defendant can be expected to take care but not to guarantee that harm will be avoided.³⁵³ This is the case for medical professionals or other professionals exercising judgment.

[514] It also applies to those exercising statutory functions. In such cases the standard of care must be related to the nature of the duty to be performed and the circumstances in which the defendant has to carry it out. Where it confers a discretion in a difficult area where there may be room for differences of opinion the Court "must be satisfied that the conduct complained of went beyond mere errors of judgment and the exercise of a discretion and constituted conduct which can be regarded as negligent".³⁵⁴ Where the statutory function involves exercising control over a risk, knowledge of the risk, the extent of the risk and the options available to the defendant are likely to be key.³⁵⁵ The funding and other public resources which are available to meet the demands which may be made upon the public body are relevant to this.³⁵⁶

The background

MAF's general approach

[515] The Plant Imports team did not have a formal policy or procedure document setting out the steps required to issue an import permit until 2012. Dr Butcher, the Operational Standards (BSG) Team Manager at the relevant time who later became the Group Manager to whom the Plant Imports team reported, said this was partly

³⁵³ *Todd on Torts* at 423.

³⁵⁴ *Barrett v Enfield Borough Council* [2001] 2 AC 550 at 591 per Lord Hutton, cited in *Couch (No 1)* at [37] per Elias CJ (with whom Anderson J agreed).

³⁵⁵ *Couch (No 1)* at [38].

³⁵⁶ *Todd on Torts* at 374.

because Ms Dickson, the adviser in the team who dealt with import permit requests, had been in the role for more than 20 years and was therefore very experienced.³⁵⁷

[516] Dr Butcher described how the Plant Imports' team approached a request to import a plant or plant product at the relevant time. The first assessment for the adviser in the team receiving the request was to make a decision about what risk assessment approach was appropriate for the request. He described this as a "screening" or "triaging" decision.

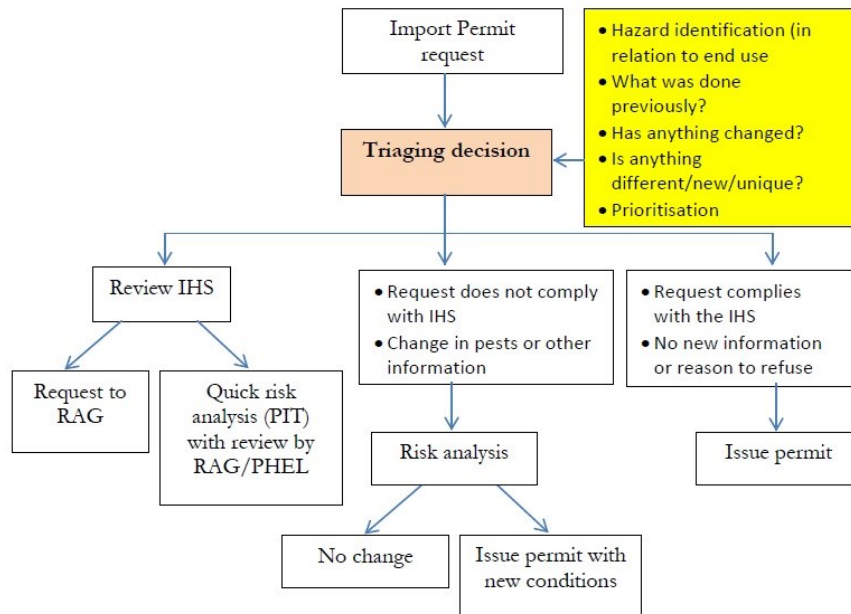
[517] For example:

- (a) If the commodity had been imported many times before and the measures are well understood and, crucially, there was no new information that suggested the risk had changed, the adviser could issue the permit with the previous conditions.
- (b) If the request was for a commodity covered in the scope of the IHS, but had not been imported before, the adviser would consider, based on the information provided, whether they were confident that they had sufficient information to issue the permit or if they needed additional information. They would also consider other previous requests for a similar commodity and their general experience of the commodity and the associated pests. If they were satisfied, they might adopt sensible measures and issue the permit. If there was no evidence that a particular risk was associated with the commodity, there would be no reason to turn down the request. So a permit would be issued.
- (c) Otherwise it might be that a full risk assessment (risk assessment can vary from a quick discussion to a fully published document, depending on the circumstance) needed to be done. This would be necessary because the application was brand new and the Plant Imports team did not know anything about it.

³⁵⁷ Ms Dickson holds a BSc in Botany. She was employed at MAF from 1978 to 2012. A number of witnesses commented on her experience.

- (d) Finally, if the request triggered a review of the IHS or schedule, the adviser would approach MAF's Risk Assessment Group (RAG) and ask for a risk assessment to support a review. The IHS review would then be prioritised into the work programmes of Plant Imports and RAG.

[518] Dr Butcher provided the following diagram to illustrate this process:



[519] This diagram was not in existence at the time. However it reflects how the relevant witnesses understood the process at the time.

Risk assessment process

[520] Dr Sathyapala, the Team Manager of the Plants Risk Assessment team,³⁵⁸ explained that RAG is a separate Directorate from Plant Imports. RAG identified the hazards (pests and diseases) associated with a particular commodity or pathway, the likelihood of the hazard entering, establishing or spreading in New Zealand, and the likely impact the hazard might cause on plants, environment, economy and human health. The Plants Risk Assessment team had up to 12 analysts in the team when Dr Sathyapala was the manager.

³⁵⁸ Which had various names at that time.

[521] In 2006 MAF put in place its “Risk Analysis Procedures” for use by Biosecurity New Zealand. This was the business group within MAF that was the lead agency for New Zealand’s biosecurity system. The Risk Analysis Procedures were prepared by Dr Mike Ormsby, a senior advisor in RAG, and a team working under him.³⁵⁹ Dr Ormsby said that this document arose from an influx of new staff and the need to collate all relevant procedures.

[522] The Risk Analysis Procedures defined four important terms:

Risk: the likelihood of the occurrence and the likely magnitude of the consequences of an adverse event.

Risk assessment: the evaluation of the likelihood, and the biological and economic consequences, of entry, establishment, or exposure of an organism or disease.

Risk management: the process of identifying, selecting and implementing measures that can be applied to reduce the level of risk.

Risk analysis: the process comprising hazard identification, risk assessment, risk management and risk communication.

[523] The Risk Analysis Procedures explained the last of these terms as follows:

The risk analysis process is itself divided into four main steps: Hazard Identification, Risk Assessment, Risk Management Options, and Risk Communication and Documentation.

Hazard identification is an essential step that must be conducted prior to a risk assessment. To effectively manage the risks associated with pathways or imported risk goods, organisms or diseases which could be introduced into New Zealand that are capable of, or potentially capable of, causing unwanted harm must be identified. In the case of a single hazard, a pest risk analysis, all or many of the potential pathways of entry may be identified.

In the *risk assessment* step the risk analyst evaluates the likelihood and environmental, economic, and human health consequences of the entry, exposure and establishment of a potential hazard within New Zealand. The aim is to identify hazards which present an unacceptable level of risk, for which risk management measures are required. A risk assessment consists of four inter-related steps:

- i) Assessment of likelihood of entry

³⁵⁹ Dr Ormsby is a plant pathologist by profession and holds a PhD in science from Victoria University. He had worked at MAF in plant and forest biosecurity and risk analysis since late 1997. He continues to hold the role of senior adviser in the RAG team at the Ministry of Primary Industries (MPI).

- ii) Assessment of likelihood of exposure and establishment
- iii) Assessment of consequences
- iv) Risk estimation.

The uncertainties and assumptions identified during the preceding stages are also summarised and considered for further research with the aim of reducing the uncertainty or removing the assumption.

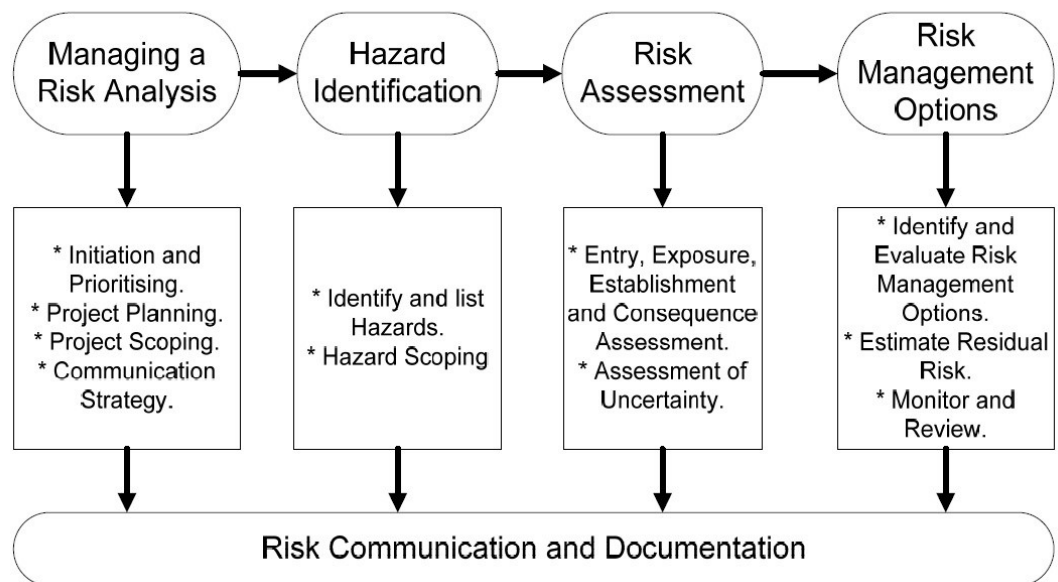
Risk management options, in the context of risk analysis, is the process of deciding upon biosecurity measures to effectively manage the risks posed by the hazard(s) associated with the commodity under consideration. Possible options are identified, and the likelihood of the entry, establishment or spread of the hazard is evaluated according to the option(s) that might be applied. An appropriate option or combination of options is then selected. Residual risk remaining after the selected options have been successfully implemented is then estimated and becomes the basis for developing a monitoring protocol that may, for instance, interpret interception data to determine if risk thresholds are being exceeded.

Risk communication is undertaken throughout the life of the risk analysis project in the manner described in the communication strategy developed at the beginning of the project.

Each risk analysis is then *documented* to facilitate the understanding of a risk analysis, to ensure that the reasons for the conclusions reached and recommendations made are obvious, and to allow for the review of the risk analysis when additional information becomes available.

The main steps of the Biosecurity New Zealand risk analysis framework are summarised in figure 1. ...

Figure 1: The Biosecurity New Zealand risk analysis framework



[524] The Risk Analysis Procedures contemplated that a risk analysis could be undertaken either by MAF or externally. However it noted:

Regardless of who undertakes the analysis it is essential to ensure that requirements for consultation and scientific rigour are met by establishing a management framework that is appropriate to the circumstances.

[525] As to how this worked in practice, Dr Sathyapala, said the Plant Risks Assessment team worked closely with the Plant Imports and Plant Exports team. Risk analysts were concerned with assessing the risk associated with a pathway, whereas Plant Imports was concerned with making decisions on the management of identified risks to an acceptable level to New Zealand. She said her team were responsible for preparing risk analyses to support decisions about new requests to import plants and plant products. She said that even where an importer had requested a permit under an IHS and a risk analysis was not required, RAG often gave advice on the request, for example to identify the new hazards associated with the commodity.

The evidence in detail

Introduction

[526] The approval of Kiwi Pollen's import permit requests took place alongside other related work streams at MAF. One of those work streams was a review of the *Actinidia* schedule to the Seeds for Sowing and the Nursery Stock IHS on the regulated pests and testing for them. Another was work being carried out on whether a new approach should be taken to pollen. The PHEL Review arose out of the latter.

Context

[527] The importation of nursery stock was regarded as important to New Zealand's primary industries. Nursery stock is the main source of germplasm (genetic material) for the development of new varieties (for example, the Hort16A and G3 varieties of kiwifruit). The evidence about this included:

- (a) In around 2005 or 2006 MAF received funding under the Government's growth and innovation framework (GIF) to develop PEQ facilities/diagnostic services to fill the gap in private supplies of PEQ

facilities/diagnostic services. This funding enabled MAF to develop the provision of level three PEQ facilities and testing services.

- (b) On 22 September 2006 MAF issued a “stakeholder update”. This advised that MAF had completed the PEQ testing manual for *Actinidia* (kiwifruit) seed and nursery stock (discussed below). By this time, the work on the PHEL Review was underway (discussed below). This was referred to in the stakeholders update as follows:³⁶⁰

[MAF] is reviewing the pests and diseases associated with pollen of high-value crops, in particular those crops for which pollen is likely to be used as a source of germplasm in New Zealand breeding programmes, eg *Pyrus* (pear). The aim of the work is to clarify the pests of concern and ensure the import requirements are appropriate. Subsequent work is planned to investigate methods to directly test pollen for diseases of concern.

- (c) In November 2006 a group called “the Plant Imports Action Group” published a paper called “Position Paper: Barriers to importation of new plant species”. This collated views from the plant industry. IHS development was one of the two regulatory barriers identified.³⁶¹ The report included the following:

- (i) There was a view that MAF requirements were a barrier to plant importation for existing species. Depending on the crop, importers may wait 5-10 years for their request to be prioritised onto MAF’s work programme.
- (ii) Importers considered decision making and compliance costs in relation to PEQ level two and three were “a major barrier”.
- (iii) There were concerns with MAF’s staff turnover, resourcing, lack of consistency, lack of clarity around the criteria for release

³⁶⁰ Issued by Biosecurity New Zealand on 22 September 2006.

³⁶¹ The other was HSNO/ERMA approval (under the Hazardous Substances and New Organisms Act 1996).

from PEQ and lack of recognition of low risk pathways and compliance costs.³⁶²

(iv) There was also a view that “[m]any of the problems are experienced by breeders or researchers who want to import small amounts of seed for observation and breeding”.

(d) On 12 December 2006 a MAF workshop took place on mitigation of risk in imported propagation material. This covered an overview of IHSs, PEQ requirements, current B3 projects, and discussion on research requirements. Pollen was included in the workshop at Dr Clover’s request.³⁶³

The IHS relating to Actinidia

[528] As discussed in “Part 2: Factual and regulatory background”, kiwifruit plant material and fruit were covered by three IHSs: Fresh Fruit and Vegetables, Seed for Sowing and Nursery Stock. Pursuant to these, *Actinidia* seeds for sowing, dormant cuttings and plants in tissue (these being the only *Actinidia* nursery stock approved for entry) had to be imported into a Level 3 PEQ, grown for at least six months and inspected and tested for regulated pests. *Actinidia* pollen required “a prior import permit”. There is no evidence of any risk assessment having been carried out for *Actinidia* pollen, nor pollen generally.³⁶⁴ This explained why pollen was not included in the *Actinidia* schedule.

[529] In 2003 and 2004 Dr Clover was involved in a review of the *Actinidia* schedules to the Nursery Stock IHS and the Seed for Sowing IHS.³⁶⁵ This review did

³⁶² Particularly “the costs of inspection on arrival when material is being shipped to a containment facility”.

³⁶³ Mr Hartley had circulated a draft agenda and Dr Clover responded to this on 8 December 2006. It is unclear what exactly was discussed at this workshop. By this time the PHEL Review had been completed and work was underway on turning it into a manuscript for publication in an external publication. Kiwi Pollen had also made its first enquiry to import kiwifruit pollen and the Plant Imports team had responded to that.

³⁶⁴ Dr Clover confirmed he was not aware of any specific formal risk analysis having been carried out for pollen generally, or for kiwifruit pollen in particular.

³⁶⁵ Dr Clover along with Dr Card, was a primary author of the PHEL Review. Dr Clover has a doctorate in plant pathology and a BSc (Hons) in biology. He has 20 years’ experience in plant pathology (particularly plant virology) and phytosanitary regulation. He worked for MAF for over

not cover kiwifruit pollen as pollen was referred to in a different part of the nursery stock IHS. As part of this work a pest risk analysis for Psa (among other *Actinidia* pests) was completed.³⁶⁶ The review also involved consultation with the industry, including with HortResearch and Zespri. The revised schedules came into force on 28 May 2004. One of the changes was to include Psa as a regulated pest of *Actinidia* nursery stock.

[530] During 2006 PHEL developed the *Actinidia* testing manual. Dr Clover was involved with this, having moved from Plant Imports to PHEL by now. There were several testing manuals to be developed but the *Actinidia* manual was prioritised first. In Dr Clover's words this was because kiwifruit was New Zealand's "most important horticultural crop" and "of great importance to NZ". This work was carried out in consultation with HortResearch and the industry.

[531] While he had been in the Plant Imports team, Dr Clover had received some pollen import enquiries and the importers were told the pollen would have to go into PEQ. Against that background, the work on the *Actinidia* testing manual contemplated a section on pollen. That is apparent from an email between HortResearch (Paul Austin) and MAF (Lia Liefing), which was copied to Dr Clover on 24 May 2006, which discussed how pollen was prepared. PHEL considered that direct testing of pollen for pathogens would be a useful diagnostic tool. It therefore commissioned research about this through HortResearch and Dr Pearson (from Auckland University). PHEL's work also identified that the test (a type of primers test)³⁶⁷ recommended in the *Actinidia* IHS schedule for Psa detection was unreliable.

[532] On 7 August 2006 members of MAF's BSG (Dr Butcher, Ms Hains), PHEL (Dr Clover) and Plant Imports team (Ms Cooper) met with HortResearch, Zespri and

a decade. This included a number of years in the Plant Imports team, including a period as manager. During his time in the plant imports team his responsibilities included developing and managing MAF's biosecurity programme for imported nursery stock and seed for sowing, including development of import requirements. He moved from the plant imports team in March 2006 to the position of team manager at PHEL. He went on to become group manager at PHEL from July 2010 to August 2013. Dr Beckett described Dr Clover as "he's a good scientist, he's a very experienced scientist".

³⁶⁶ This work was carried out by Afreen Rahman. It was completed on 14 August 2003.

³⁶⁷ The IHS previously advised the use of OCTF/OCTR primers (see: Sawada *et al* 1997) and PAV 1/P primers (see Scortichini *et al* 2002; table 1) to detect Psa in PCR.

Dr Pearson. This was to discuss the testing regime and approach to *Actinidia* importations. At this time a consignment of kiwifruit nursery stock, imported from China, had spent several years in PEQ because it displayed previously unknown viruses. As a result of this, Zespri and HortResearch had been investigating viruses associated with *Actinidia*. Dr Pearson was involved in this work.³⁶⁸

[533] On 9 August 2006 the *Actinidia* schedule of the nursery stock IHS was amended to update testing requirements for Psa using different primers test which were more reliable (PAV 1/P 22 Scortichini *et al*). On 18 August 2016 the *Actinidia* PEQ testing manual was finalised. It covered dormant cuttings, tissue culture and seed. It did not include any section on pollen. It set out the new primer testing procedure. The manual noted that the specific tests required in the IHS were to be carried out irrespective of whether plants exhibited symptoms. This was necessary to detect latent infection because “bacterial canker of kiwifruit (caused by [Psa]) may remain symptomless for two to three years after infection (Koh & Nou, 2002)”.

[534] After this, PHEL continued to be involved in diagnostic work to enable pollen to be tested in PEQ. This is apparent from:

- (a) Dr Clover’s comments for inclusion in a report to Cabinet (responding to biosecurity concerns which had been raised by businesses). These were made on 5 and 13 December 2006. He said MAF recognised that primary industries are “highly dependent on introduced agricultural and horticultural material” and that “[a]ccess to new elite genetic material is crucial to the development and marketing of improved varieties”. He said that PHEL was doing research “to enable importation of alternative forms of germplasm (eg pollen) and to develop new detection methods which are as reliable but cheaper than existing methods”.
- (b) On 15 February 2007 Dr Clover met with HortResearch (Dr Mary Horner) and Dr Pearson to discuss the project to develop diagnostic methods to directly test pollen for pests and diseases.

³⁶⁸ Dr Butcher was involved in decisions around testing and release of this consignment. It had still not cleared in November 2010.

- (c) On 20 April 2007 Dr Herrera noted in a PHEL weekly update that HortResearch had only recently agreed to the virus detection in pollen project.
- (d) In May 2008 the HortResearch paper on testing for viruses in pollen was completed.
- (e) On 15 March 2010 PHEL/HortResearch published a paper on diagnostic methods to directly test pollen for viruses.

[535] Meanwhile an importation of Chinese kiwifruit budwood had been held up in PEQ for five years. On 21 May 2007 Dr Butcher replied to a query made on behalf of Zespri about this. He noted that no further testing was required for Psa because he had received advice that it would have developed Psa symptoms within this timeframe if it was present. There was, however, a virus which needed to be tested or the budwood could be transferred to a level one PEQ but a pre-approved control system would need to be used.

The genesis for a new approach to pollen

[536] The PHEL Review arose out of a view that a new approach to pollen imports might be appropriate. When the work was being carried out on the *Actinidia* pest analysis (discussed above), pollen imports had been sporadic. Between 2004 and 2005 there were imports of gentian pollen (a type of flower) and proposed imports of narcissus (daffodil) pollen. MAF required such imports to go into a PEQ facility for pollination of mother plant and testing of the resulting seed. There was, however, some importer frustration about this because of the cost and delay it involved.

[537] The possibility of reviewing this approach was raised within MAF in November 2005. This arose out of a request by David Brundell to import clivia pollen (a type of flower):

- (a) On 30 November 2005 Dr Clover, who was the team manager of Plant Imports at this time, forwarded some information regarding the request to Brian Double who was at that time national advisor of Plant Imports

and was dealing with the request. Dr Clover's view was that MAF should "stick with its current policy" of requiring the pollen to be imported into a PEQ facility.

- (b) Mr Double advised the importer by email, copied to Dr Clover and Ms Dickson that the pollen would need to go into a PEQ facility and that, following pollination, the fertilised plants would be isolated for three months and given biosecurity clearance subject to a satisfactory MAF inspection.
- (c) At the same time Mr Double separately emailed Dr Clover, copied to Ms Dickson and another MAF employee, stating that he considered this approach should be examined further because he believed pollen was generally considered a low risk item for transmissible diseases. He suggested examining the possibility of treating pollen in the same way as seed – that is, species with basic seed conditions would be given clearance, whereas species with specific disease requirements would be directed to a transitional facility. He considered MAF's "current policy" of directing all pollen to a PEQ might be more easily altered because it was a policy that was not written down.

[538] The next enquiry about pollen, so far as the discovered records show, was on 14 December 2005:

- (a) HortResearch advised MAF (Mr Double) that it had been approached by an Italian company which was interested in exporting kiwifruit pollen from Italy to New Zealand for use in artificial pollination in commercial kiwifruit orchards.³⁶⁹
- (b) HortResearch had received advice from Ms Dickson that a permit would be required, and was asking Mr Double for an indication of the likelihood of success of this application.

³⁶⁹ HortResearch advised that the pollen would be either vacuumed directly from the flowers or milled. Either way, the target was "to have pollen only with no contamination from other plant parts such as stamens, petals or stigmas".

- (c) Mr Double responded on 10 January 2006, copied to Dr Clover, that pollen could only be used in a PEQ facility (level three) and following pollination the fertilised plants would be isolated for six months and given biosecurity clearance subject to a satisfactory MAF inspection.

[539] After this, Mr Brundell was again making enquiries about importing clivia pollen. This would enable him to breed more quickly than if he imported seed. He approached Dr Clover as they were colleagues on the PEQ work being carried out:

- (a) On 17 July 2006 Dr Clover emailed Michele Dickson and Mr Double (his former Plant Import colleagues) about the import requirements for pollen in light of this request. Dr Clover noted that he knew MAF had always “struggled with this” but as MAF allowed clivia seed under the basic requirements, Dr Clover suggested it would not be unreasonable to let him import pollen under the same requirements. He asked whether they nevertheless considered that pollination in PEQ facility would be required.
- (b) Mr Double responded on 18 July 2006 noting that in the past MAF had treated pollen like nursery stock and required that it go to PEQ. He thought, however, that MAF had not been “properly dealing with this risk and should consider another tack”.
- (c) Dr Clover agreed that MAF’s measures were not commensurate with the risk and that the policy should be reconsidered. He said:

The plant pests and diseases associated with pollen are a sub-set of those associated with seed and therefore as you said last November a sensible approach would be: “species that have basic seed conditions are given clearance, species that have specific disease requirements are directed to a transitional facility”.

- (d) Dr Clover asked Mr Double if he wished to take this approach. If so, he suggested Mr Adams (another person who had approached MAF), could then also bring in narcissus pollen.

- (e) On 20 July 2006 Mr Double confirmed that he agreed to this for Mr Brundell's clivia pollen and Mr Adams' narcissus pollen. This would mean basic conditions of a permit and inspection before release.

[540] After this change of tack for these two requests, on 18 July 2006 MAF had employed Dr Stuart Card on a six month contract to carry out a literature review on pests and diseases transmitted by pollen. This review was to be carried out under Dr Clover's supervision. This literature review is what in this litigation is described as the PHEL Review. It is apparent the purpose of this review was to investigate whether more generally a new approach to pollen could be taken. This was the subject of a meeting to take place between senior members of PHEL (Dr Veronica Herrera), Plant Imports (Ms Cooper) and RAG (Dr Sathyapala) on 29 August 2006.

[541] On 24 August 2006 Dr Clover emailed Dr Herrera to provide her with background information for that meeting. Dr Clover advised her of the following:

- (a) The current approach was essentially to treat the pollen as if it were seed. This meant:
 - (i) pollen of species for which the seeds were subject to the basic requirements only, was also only subject to those basic requirements (an import permit, inspection at the border, then clearance); and
 - (ii) pollen of species for which seeds had "additional" requirements, was also subject to those additional requirements (an import permit, inspection at the border, movement to a transitional facility, pollination of plant, and collection of the resulting seed which would undergo the same inspection and testing measures as applied to imported seeds).
- (b) Some species (such as *Pyrus* (pear)) had in the past been treated differently as MAF identified pests and diseases that are pollen-borne and required testing for those.

- (c) An issue with the current approach was that seeds are affected by many more pests and diseases than pollen and therefore MAF was requiring measures for pests which did not affect the commodity. This was not WTO-SPS compliant. Additionally, the process of importing into a transitional facility, pollination, collection and testing of seeds was very time consuming and expensive.
- (d) It was therefore proposed that PHEL would review pests and diseases which were pollen-borne; allow pollen to be imported into a transitional facility, pollinated, and then the seed tested for pollen-borne diseases only (this would not require risk analysis, only hazard identification, because the measures remained unchanged); and PHEL would also investigate methods of directly testing pollen.³⁷⁰

[542] Prior to the intended 29 August 2006 meeting, BSG (Dr Butcher) Plant Imports (Ms Cooper) and PHEL (Dr Clover and Dr Herrera) were in email communication on 28 August 2006 about the import requirements for *Actinidia* nursery stock. A circulated document noted that:

- (a) *Actinidia* is an important horticultural crop for New Zealand and that to ensure the ongoing value to New Zealand, it was essential that breeding is facilitated through the import of new genetic material.
- (b) Several methods of import were available, including importing pollen, seed and nursery stock. Each method had advantages and disadvantages for breeding and each presented a different biosecurity risk.
- (c) The highest level of risk was associated with the import of nursery stock because of the range of potentially associated pests and diseases. However this method also gave the most rapid assessment method for new germplasm and access to elite varieties bred overseas.

³⁷⁰ On 24 August 2006 Ms Cooper commented in an email to Dr Clover on the lack of resources in Plant Imports with Mr Double and another MAF employee gone.

- (d) To facilitate imports of *Actinidia* nursery stock in the future these procedures should be followed: where possible, pre-test material in the country of origin and source only disease-free material; maintain the individual lines as separate lines in quarantine; source material from clearly identified and independent source plants; label each plant and maintain a robust labelling and plant management regime in quarantine; and test the plants for freedom from the viruses known to infect *Actinidia* once the specific tests had been developed.

[543] The intended meeting between PHEL (Dr Herrera), Plant Imports (Ms Cooper) and RAG (Dr Sathyapala) took place on 29 August. At the meeting the following matters were discussed:³⁷¹

- (a) The IHS was to be modified to require that all pollen be microscopically inspected prior to clearance (to ensure no rust spores, for example) and that this could be done at an approved facility (for example, HortResearch) or at the MAF lab if required.
- (b) PHEL would review pests and diseases which are pollen-borne and this would be sent to a Crown Research Institute or university for peer review (with pre-clearance being kept in the loop).
- (c) Pollen imports would go into a transitional facility with pollination and testing of seed for pollen-borne diseases only. PHEL would determine which tests could be used.

[544] After the meeting there were communications about the scope of the PHEL Review:

- (a) Dr Sathyapala replied on 30 August 2006 to Ms Cooper and Dr Herrera (copying Dr Butcher and Dr Clover), inquiring whether the review and the IHS changes were limited to *Actinidia* or applicable to all high value

³⁷¹ Dr Herrera recorded these matters from the meeting in an email to Dr Sathyapala and Ms Cooper that day.

crops. She agreed that it was a good idea to send the document for external review to a Crown Research Institute and university. She also noted that RAG and BSG teams would do the internal review.

- (b) Dr Herrera replied on 30 August 2006 confirming that the review and the IHS changes were for more than just *Actinidia*. For example they would cover apples and pears.
- (c) Dr Clover also replied on 30 August 2006 confirming that the review would cover all pest and diseases that are transmitted by pollen. He commented that this was unlikely to be a long list because pollen transmission was the exception rather than the rule. He made suggestions for peer review.³⁷²

[545] It can therefore be seen that it was at this meeting it was proposed that the PHEL Review was to assess the pests and diseases associated with pollen and the outcome could potentially lead to changes to the Nursery Stock IHS, including for *Actinidia*. The idea was still that pollen imports would go into PEQ where they would be used to pollinate a plant. The pollen would be microscopically inspected. The seed from the pollinated plant would be tested for pollen-specific pests and diseases only. It was also agreed the PHEL Review would be subject to both internal and external peer review.

The PHEL Review

a) The scope of the review and first draft

[546] As noted, on 18 July 2006 MAF employed Dr Card on a six month contract. This was to carry out a literature review of pests and diseases transmitted by pollen under Dr Clover's supervision. Dr Card had completed a PhD in plant pathology (researching biological control of a type of fungal pathogen on multiple crops). He is

³⁷² His suggestions for possible external peer reviewers include Dr Pearson (from Auckland University). He also suggested possible internal reviewers, including Tamsin Hains (a scientist in MAF's BSG, with expertise in viruses and viroids but not bacteria) because she had good virology experience and had previously done literature reviews on pollen transmission.

an endophyte mycologist.³⁷³ Dr Clover chose Dr Card because, as a mycologist, he would have a broad understanding of plant pathology.

[547] The scope of the review was set by Dr Clover. Dr Card understood the reason for the review was that there was a number of industry groups interested in using pollen as a germplasm for breeding new species. He did not know how the report would be used. He understood he was to consider “transmission” by pollen in a specific sense: that is, the specific mechanism or route that a particular pathogen or organism has developed or evolved (potentially over millions of years) to pass from a mother plant to a daughter plant.³⁷⁴

[548] Dr Card further explained that for pollen “transmission” of bacteria in this sense, it would generally have to infect that exact piece of the plant tissue and be part of it. As the pollen fertilises the flower, grape or seed, the microorganism hitches a ride and enters the plant or the ovule and basically takes advantage of that plant’s reproductive cycle. He was not dealing with contaminants (that is, impurities) because basically anything could be contaminant. If he was to undertake a review of all possible contaminants this would not be a succinct piece of work as it would “basically encompass thousands or millions of organisms”.

[549] Dr Clover’s evidence was that the scope of the PHEL Review was broader than Dr Card’s understanding of it. It was to cover what pests and diseases might move by pollen from an infected plant to an uninfected plant. There were a number of ways of describing how the pathogenic organism might move and it was not intended to limit this to a particular type of movement. The paper was, however, intended to focus on pollen without extraneous material. That is, pure pollen.

[550] A literature review means reviewing the literature to report on what is known at the time it is conducted. It is a report on the current state of knowledge rather than investigatory or experimental work. To conduct the literature review, Dr Card said he

³⁷³ An endophyte mycologist works with fungal endophytes (these are fungi which live within a host without causing damage).

³⁷⁴ Dr Card further explained transmission could occur horizontally or vertically. Horizontal transmission involves, for example, an airborne pathogen arriving on the flower and infecting the plant. Vertical transmission is when a pathogen is already present on the plant and transmitted through the seed pathway.

would have searched key words such as “pollen bacteria” or “pollen virus”. He would have screened these to find the most relevant ones. The review was the focus of his six month contract. He was not under time pressure. It was careful and considered work. As he prepared parts of the review he submitted them to Dr Clover.

[551] The first draft was provided by Dr Card to Dr Clover on 4 August 2006. At this time the paper had sections on:

- (a) viruses transmitted by pollen;
- (b) cryptoviruses transmitted by pollen;
- (c) viroids transmitted by pollen;
- (d) bacteria, actinomycetes and fungi transmitted by pollen; and
- (e) pests transmitted by pollen.

[552] The bacteria section included three paragraphs:

- (a) The first paragraph referred to a study authored by Śpiewak *et al* and commented that, although not technically transmitted by pollen, this study had detected a number of microorganisms present on pollen grains of rye, mugwort, hazel, and European alder. The paper noted that this study:

... was primarily interested in the microflora of plant services with respect to allergens in animals and humans and found a range of mesophilic bacteria, thermophilic actinomycetes and fungi in concentrations of up to 34,000 cfu g⁻¹ of pollen.

The paper also noted that the most dominant species which the study had detected were all non-regulated saprophytic microorganisms already present in New Zealand.

- (b) The second paragraph noted that “[m]any authors have indicated that pollen is important in the dissemination of fungal pathogens” and

provided an example of one of these studies. This had found that pollen grain of rapeseed was heavily contaminated with a type of fungus and this was transported by honey bee vectors to healthy plants resulting in head blight of rapeseed.

- (c) The third paragraph referred the related subject of the ability of some fungal pathogens to use signals to attract insects to fungus-induce pseudoflowers where fungal gametes or infectious spores are produced. However the fungal spores are not truly transmitted by pollen because the fungus replaces the pollen and tricks the insects into collecting them.

[553] The section on pests transmitted by pollen said:

There are no reports of mites, nematodes or insects being transmitted by pollen as a valid mechanism in their life cycles. However many insects serve as vectors for plant viruses and can carry particles onto pollen when feeding, for example: thrips, pollen beetles and honey bees.

[554] This first draft of the PHEL Review also set out pathogens specific for each genera of host plant. *Actinidia* was listed in this section. The draft said “[t]here are no recorded pests or pathogens (found to date) that are pollen transmitted in *Actinidia* spp”.

[555] During September 2006 Dr Card and Dr Clover produced further drafts of the PHEL Review. These drafts had sections on viruses, cryptoviruses, viroids, “bacterial, mollicutes and fungi” and invertebrates³⁷⁵ under the heading “Pollen transmission”. The bacteria, mollicutes and fungi section was as follows:

Mollicutes lack cell walls, have relatively small genomes compared to other bacteria and are obligate parasites of plants (found only in the phloem tissue) and some insects. To date there are no known bacteria or mollicutes that are pollen transmitted (Nemeth 1986b).

There are a limited number of reports on the association of fungi with pollen, with the majority of reports involving saprophytic species on a restricted number of plant hosts. ...

³⁷⁵ Dr Card said he had never studied mollicutes. They are not bacteria or a fungus. They had previously been described as bacteria but had since been found to be a new kingdom of organism.

The only other reports in the literature that associate pollen and fungi are not concerned with the mechanisms of transmission but observations of pollen contamination by saprophytic species. [The paragraph then discussed Śpiewak *et al* (1996) as per the first draft.]

[556] The drafts contained a section on “pathogens specific for each genera of host plant”. Under *Actinidia* the draft stated “[t]here are no recorded pests or pathogens (found to date) that are pollen transmitted in *Actinidia* species”.

b) *The internal review*

[557] On 7 August 2006 Dr Clover forwarded Dr Card’s first draft of his literature review to Dr Herrera and Brett Alexander (both from MAF).³⁷⁶ Dr Clover noted that, once it was complete, PHEL wished to use the information to enable imports of pollen of high value crops with direct testing. On 31 August 2006 Dr Sathyapala advised Dr Clover that all three external reviewers he suggested were acceptable to her. She said that Sydney Fernando, a member of the RAG team, had experience on similar work and would do the RAG internal peer review. On the same day Ms Cooper confirmed her agreement to Dr Clover’s proposed approach.

[558] On 29 September 2006 Dr Clover sent copies of the draft PHEL Review to Dr Pearson, Ms Hains, and Dr Fernando for peer review. In sending the draft to Dr Pearson, Dr Clover asked for comments on the draft “as an internal MAF report and as a potential publication”. In sending the draft to Ms Hains and Dr Fernando, Dr Clover suggested the review should take around three weeks (i.e. finish by 20 October 2006).

[559] The draft as forwarded to Ms Hains and Dr Fernando was called “Pollen-transmitted plant pathogens”. It was structured with the following sections:

(a) Introduction

(i) Pest Risk Analysis

³⁷⁶ Dr Herrera was the head of PHEL at the time. Dr Clover reported to her. When Dr Herrera gave her evidence she did not recall commissioning the review. However the 29 August 2006 note of the meeting shows that she was involved in the decision to utilise the work in support of potentially changing the requirements for pollen imports.

- (ii) Seed Transmission
- (iii) Pollen Transmission
 - 1. Viruses
 - 2. Viroids
 - 3. Bacteria, Mollicutes and Fungi
 - 4. Invertebrates
- (b) Detailed Information regarding the viruses and viroids that are transmitted by pollen:
 - (i) Viruses (under this heading were 16 sections relating to 15 specific viruses and a last section on “unassigned viruses”).
 - (ii) Viroids (under this heading were four sections relating to four specific viroids).
- (c) Pathogens specific for each genera of host plant:
 - (i) *Actinidia* species
 - (ii) *Malus* species
 - (iii) *Pyrus* species
 - (iv) *Ribes* species
 - (v) *Vaccinium* species
- (d) References.

[560] Under the heading “Pest Risk Analysis” the draft included the following paragraph:³⁷⁷

The purpose of this review is to assist the risk analysis process by identifying the pests and diseases that are transmitted by pollen. In considering whether a pest or disease is transmitted by pollen, the following criteria were considered during the review:

- association with pollen; and
- transmission via pollen to the mother plant during pollination and/or to the seed following fertilisation; and
- whether observations had been made *in vivo* or from experimental studies; and
- the existence of contradictory reports; and
- the quality of the evidence presented.

[561] Under the heading “Pollen Transmission” and the subheading “Viruses” the following paragraph was included:

When a virus is transmitted by pollen, it may infect the seed and the seedling that will grow from that seed (termed vertical transmission), or it may infect the plant through the fertilized flower (termed horizontal transmission) (Hull, 2004). However, if virus particles are observed in or on pollen grains, or are found to replicate in pollen grains, it cannot be assumed that the virus is naturally transmitted by pollen. Similarly it cannot be assumed that if the virus is transmitted horizontally by pollen there will also be vertical transmission.

[562] Under the heading “Pollen Transmission” and the subheading “Bacteria, mollicutes and fungi”, the complete section was as follows:

Mollicutes lack cell walls, have relatively small genomes compared to other bacteria and are obligate parasites of plants (found only in the phloem tissue) and some insects. There are no known bacteria or mollicutes that are pollen transmitted (Nemeth, 1986b).

There are a limited number of reports on the association of fungi with pollen, with the majority of reports involving saprophytic species on a restricted number of plant hosts. Then there are rare exceptions for example Stelfox *et al.* (cited in Li *et al.*, 2003) found that pollen grains of rapeseed (*Brassica* spp.) were found to be heavily contaminated with ascospores of *Sclerotinia sclerotiorum* and these were found to be transported by honey bee vectors to

³⁷⁷ At the time of Dr Fernando and Dr Ormsby’s review (discussed later) the words “to date” had been removed from the sentence referencing Nemeth. It read “there are no known bacteria or mollicutes that are pollen transmitted (Nemeth, 1986B)”.

healthy plants resulting in head blight of rapeseed. *Verticillium albo-atrum*, which causes wilt of alfalfa (*Medicago sativa*) is also known to be spread by pollen and insect vectors (Huang, 2003). The severe strain of this fungus is regulated in New Zealand; however the hop and lucerne strains are not regulated. Other *Verticillium* spp. may be also vectored by pollen, species that are regulated in New Zealand include *V croci*, *V cyclosporum*, *V foexii*, *V heterocladium*, *V kubanicum*, *V lamellicola* and *V vinerescens*.

The only other reports in the literature that associate pollen and fungi are not concerned with mechanisms of transmission but observations of pollen contamination by saprophytic species. For example Śpiewak *et al.* (1996) detected a number of microorganisms present on pollen grains of European alder (*Alnus glutinosa*), hazel (*Corylus avellana*), mugwort (*Artemisia vulgaris*) and rye (*Secale cereale*). The research investigated the microflora on plant surfaces with respect to allergens in animals and humans. A range of mesophilic bacteria, thermophilic actinomycetes and fungi, were found in concentrations of up to 34000 cfu g⁻¹ of pollen. The dominant species were *Alternaria alternata*, *Cladosporium herbarum*, *Panoea agglomerans* and *Thermoactinomyces thalpophilus* (Śpiewak *et al.*, 1996), all are non-regulated saprophytic microorganisms present in New Zealand

[563] Under the heading “Pollen Transmission” and the subheading “Invertebrates”, the draft stated:

There are no reports of arthropods, nematodes or insects being transmitted by pollen any stage of their lifecycles. However, many insects serve as vectors for plant viruses and can carry particles onto pollen when feeding, for example: thrips, pollen beetles and honey bees.

[564] Under the heading “Pathogens Specific for Each Genera of Host Plant” and the subheading “*Actinidia* Species” the draft stated:

Genus of woody plants in the family *Actinidiaceae*. There are no recorded pests or pathogens that are pollen transmitted in *Actinidia* species.

[565] On 4 October 2006 Ms Hains (on behalf of herself and Dr Fernando), sought clarification from Dr Clover as to exactly what he was asking them to do. She said it was “a very large piece of work” and they wanted clarification on the areas they were to review. She recalled in oral evidence she met with Dr Fernando and they agreed they wanted clarification of what was expected. This was a large piece of work and they were already “bogged under”.

[566] Dr Clover replied on the same day (copying Dr Butcher, Dr Fernando, Dr Herrera and Dr Sathyapala) suggesting that they concentrate on the introductory part (pages one to nine) and section three (pages 41-43) which dealt with the pests and

diseases that are transmitted by the types of pollen likely to be imported. Rather than trying to go through each virus and viroid in the tables, he suggested that it would be good to have an overview and perhaps pick one or two species to have a more detailed look at. He said that, as it was Dr Sathyapala (or possibly Ms Cooper) who had requested the internal peer review, they should ask her about her expectation for the review. Dr Clover did not anticipate them spending more than approximately three to six hours on this.

[567] Dr Sathyapala's recollection of her expectations at the time of the internal peer review was that it should be in-depth and thorough. In cross-examination, she stated that she expected the RAG reviewers (Dr Fernando, and Dr Ormsby who she asked to assist with this) to conduct a thorough peer review and, where there were significant statements or findings, review the cited literature themselves to ensure accuracy. However, there is no documented evidence of Dr Sathyapala communicating such expectations or of her asking for a more detailed review than what was requested by Dr Clover (i.e. he anticipated that no more than three-six hours would be spent on the review) even though she was copied into and actually identified in the email as someone who should be asked for her expectations regarding the review. In oral evidence, Dr Sathyapala referred to the fact there would be an external peer review and that she told the internal reviewers (in person) to record their concerns on paper to support her claim that she expected a more thorough internal peer review than that which was communicated by Dr Clover. Ultimately her recollections of these conversations were muddled (unsurprisingly given they had occurred more than 10 years earlier and Dr Sathyapala was and remains a busy person) and there was nothing else to suggest that she had clearly communicated her expectations of a more in-depth review than what was expected by Dr Clover. Indeed the peer review actually undertaken was more consistent with Dr Clover's expectations than Dr Sathyapala's.

[568] Ms Hains does not recall discussing the scope of the peer review with Dr Sathyapala. On 11 October 2006 she sent her comments on the review to Dr Clover and Dr Fernando. She had taken the approach Dr Clover suggested and had picked some viruses/viroids at random to check. She provided comments on them. On

17 October 2006 Dr Card responded to her comments. She considered Dr Card's response was reasonable and he had made some changes to his paper as a result.³⁷⁸

[569] Dr Fernando did not recall any details about his involvement in the review. However email correspondence shows his involvement. It is apparent his main concern with the PHEL Review was that he could not understand its scope and purpose because it did not fit with a RAG risk analysis. On 5 October 2006 he provided a few comments to Dr Sathyapala. These comments were as follows:

- (a) he queried whether this was a pest risk analysis and said if so it should follow the risk analysis team standard/format;
- (b) the introduction needed to state the overall objective, sub-objectives and tasks (because this was currently unclear/not stated) and it should include the project scoping and the timeframe;
- (c) the table format was not the normally accepted one for a pest risk analysis;
- (d) the brief introduction on pathogens was not enough for a review: it should describe the biology, host range and symptoms at length; and
- (e) in describing the commodity, the variety and country of origin should be included, if possible.

[570] Dr Fernando said this information should be included before carrying out a review. Dr Sathyapala decided to involve Dr Ormsby. As mentioned earlier, Dr Ormsby was a senior scientist in the RAG who had been responsible for the Risk Assessment Procedure document of 12 April 2006. He is a plant pathologist/physiologist. He had worked with fungi and bacteria. Dr Ormsby understood Dr Sathyapala had concerns about Dr Fernando's competency and wanted someone more experienced to provide oversight on the review. Dr Sathyapala's evidence was that she did not have concerns about Dr Fernando's competence. She

³⁷⁸ The paper's treatment of viruses is not in issue in this proceeding.

said that, although Dr Fernando had knowledge of viruses and plant mycology, he had limited experience in the risk team. She described Dr Ormsby as having experience in RAG and being good at looking at the worst case scenario. She also wanted Dr Ormsby to be involved because this was the first report of this kind being done outside RAG.

[571] On 6 October 2006 Dr Sathyapala forwarded Dr Fernando's comments to Dr Ormsby by email simply noting "[h]ere is the document". On 7 October 2006 Dr Fernando also sent his comments to Dr Ormsby noting that Dr Sathyapala had told him that Dr Ormsby would also be going through the PHEL Review. He suggested they talk about it on Monday.

[572] On 8 October 2006 Dr Ormsby provided his comments to Dr Fernando and Dr Sathyapala. On 13 October 2006 Dr Fernando sent his and Dr Ormsby's comments on the PHEL Review to Dr Clover, copied to Dr Sathyapala. Dr Fernando's comments were along the lines of his comments on 5 October 2006. They included the following.³⁷⁹

- (a) Under the heading "Introduction":

It would be better to state the documents overall objective, specific objectives and tasks in the introduction.

- (b) Under the "Pest Risk Analysis" heading, which immediately followed the introduction section:

Pest risk analysis or a review?

- (c) In the "Pest Risk Analysis" section, alongside the statement, "[t]his analysis has included pollen imported for breeding purposes but the import requirements have yet to be formalised":

³⁷⁹ On the front page of one version of the PHEL Review Dr Fernando commented "[i]f it is a Pest risk Analysis, should be done according to the standard set by the Risk Analysis team". Dr Ormsby responded "I do not think this document is trying to be a PRA but rather a summary of information that could be of use to someone undertaking a PRA". It is unclear if this comment was in the version sent to Dr Clover or whether it was removed following Dr Ormsby's response. Dr Clover's brief of evidence referred to having received a version of the PHEL Review without this. The point is not sufficiently material to make a finding on it. I will proceed on the basis that it was not included.

Is it a review of IHS?

- (d) Also in the “Pest Risk Analysis” section, alongside the statement, “[t]he purpose of this review is to assist the risk analysis process by identifying the pests and diseases that are transmitted by pollen”:

Is this the project’s scope? So, who is doing the analysis and timeframe?

- (e) Under the heading “Seed transmission”, alongside the statement “[p]ollen transmission of viruses is closely related to seed transmission...”:

Seed born/seed transmitted? Better to clarify.

[573] Dr Ormsby’s comments included the following:

- (a) In relation to the heading “Seed transmission”, adding “of Viruses” and, in relation to the statement that “[p]ollen transmission of viruses is closely related to seed transmission (Mink, 1993) as many viruses that are seed transmitted are also transmitted by pollen (Hull, 2004)” which immediately followed that heading, asking:

What about other diseases and pests?? Or is this just a review of viruses with the rest tacked on bit with little regard as the author is a virologist?

- (b) Also under the heading “Seed transmission” in relation to the sentence “[t]here are two mechanisms by which viruses can be seed transmitted: either directly through the mother plant or through the pollen”:

How does this relate to the rest of this paragraph? I assume “through the pollen” relates to seed that is infected that leads to new infected plants but not to an infected parent? Need to be clearer.

- (c) In relation to the section on “bacteria, mollicutes and fungi”:

What all this shows is that pollen can be contaminated by fungi (and bacteria) and as such pollen can act as a vector of fungi and bacteria. Given that the pollen used in trade would

be mechanically applied to the plant, bee transmission is not important.

- (d) In relation to the statement that “[t]here are no reports of arthropods, nematodes or insects being transmitted by pollen at any stage of their life cycles” (under the section on “invertebrates”):

Yes, but how about with pollen as a contaminant of a pollen sample (we have found mites in imported pollen samples)

- (e) Amending the heading “Pathogens specific for each genera of host plant” to read:

Viruses/viroids specific for five host plant genera.

- (f) Suggesting, under this section, that *Actinidia* be removed as this genus had no viruses/viroids.

[574] Dr Ormsby considered the paper had focussed on viruses and this focus might have left unexplored concerns about other pests. He was not overly convinced the authors had identified the full extent of available evidence. He thought it looked as though there were off-hand comments around fungi and bacteria, which had not been approached in the same way as viruses. He was aware that pollen can be contaminated by fungi. When issuing permits for pollen he had established that fungi were a risk.³⁸⁰

[575] Dr Ormsby’s comment concerning “through the pollen” (at [573](b)) was made because there are a complex number of pathways and the paper had overly simplified these. He thought it would be valuable to expand on this and make it clearer what they meant. Even in the narrowest sense of transmission (as described by Dr Card) he would not necessarily discard the risk of bacteria.

[576] Dr Ormsby’s view of what the draft said about bacteria was that it was “wrong”. His evidence was that:

They’d made a very general statement about bacteria and I opposed it, I mean, obviously I do not think that was correct at the general level they’d made it

³⁸⁰ Dr Ormsby had been involved with issuing plant import permits until 2004 and had experience covering the development of much of the international standards that relate to the management of plant biosecurity at the time.

and I didn't take the time then to look for actual evidence. That wasn't my brief, if you like.

...

To be honest my reading at the time was that it was, it was just drawing wrong conclusions. The conclusions were incorrect.

[577] He explained this further in his evidence:

... So, I mean, environmental bacterial is everywhere ... It's all over us ... all the time ... if you said to [me] "Can bacteria be associated with pollen?" I would say, "Yes"...bacteria [is] everywhere...

[578] Dr Ormsby went on to explain the difficulty he had in completing his PhD (which took him seven years part-time) because he needed to keep his containers sterile. He kept having to throw out his containers because of contamination from bacteria. He described bacteria as "[v]ery, very persistent in the environment and very hard to clean something up". He also worked in import permits reviewing pollen for forestry. Bacteria was not a concern for forestry, but fungi is. Spores from fungi are roughly the same size as bacterium and have been detected and are known to move in pollen. Measures on pollen imports were put in place to manage that risk in forestry. Against that background Dr Ormsby said:

... [t]he claim that pollen is somehow immune from bacterial contamination would be an odd claim to make. It's not really science to make a claim like that. It would be the reverse. That there's no evidence [of] that ...

[579] There is a difference in the evidence of Dr Ormsby and Dr Sathyapala as to what Dr Ormsby was required to do. He did not think he was being asked to do an in-depth review. If he was reviewing the paper for publication, he would have done a lot more work than he did. He would have chased up the references particularly relating to the claims which he did not agree with. He had started off making a number of comments in the paper, but as he went on his comments tapered off because the paper was drawing the wrong conclusions. Dr Ormsby's understanding is consistent with Dr Clover's earlier response to Ms Hains and Dr Fernando which Dr Sathyapala had seen. There is no documentary record showing Dr Sathyapala had expected more from Dr Ormsby. Dr Ormsby said that he would have talked to Dr Sathyapala about his concerns with the paper. He may have also mentioned them to Dr Fernando. He was sure he would have told Dr Sathyapala this at the time.

[580] Dr Sathyapala accepted that Dr Ormsby would have discussed the peer review with her. She could not remember the detail of what he said. Her evidence was that she expected the peer review to be thorough and for the literature to be checked. She accepted Dr Ormsby may have told her he had concerns about the quality of the paper. She said she would have asked him to put all his comments on the paper because then they could be addressed. She said that sometimes there are differences of opinion with scientists so if he did not put his comments in writing she would not have pursued this further. Once again, there is nothing in writing to confirm that Dr Sathyapala's recollections about what she said to Dr Ormsby were correct. It does not seem that Dr Sathyapala made her requirements clear to Dr Ormsby as he was concerned about the paper but took no further action after his discussion with Dr Sathyapala.

[581] On 23 November 2006 Dr Card responded to Dr Fernando on the comments Dr Fernando and Dr Ormsby had provided. In response to the comment querying whether this was just a review of viruses, Dr Card said that other diseases and pests were included and that the review of these had been done "in depth". He explained that the majority of the review was on viruses because viruses were the dominant pathogens transmitted by pollen. Dr Card said there were no reports in the literature of other invertebrates "being associated with pollen", however, if Dr Fernando had "information of any other organisms present in pollen", he would be happy to consider including it.

[582] Also on 23 November 2006 Dr Fernando forwarded Dr Card's response to Dr Sathyapala and Dr Ormsby simply stating "FYI". Dr Ormsby considered that, following their feedback, some of the wording was changed to make it clear that the review was not a risk assessment. The heading "Pest Risk Analysis" which had previously followed the "Introduction" section was removed. However the content of this section had not changed. No change was made in response to Dr Ormsby's comments about fungi and bacteria contaminating pollen, nor to refer only to viruses and viroids (rather than "pathogens") in relation to the section specific to *Actinidia*.

[583] It seems that at this stage Dr Ormsby, although disagreeing with the conclusions drawn about bacteria, took no further action because it was no longer purporting to be a risk assessment. That had also been Dr Fernando's concern. For

his part, Dr Card was unconcerned about the feedback from Dr Ormsby because he was considering pollen transmission in the narrow sense. That was no doubt influenced by the original conception that pollen was to be used as a source of germplasm by pollinating a mother plant in PEQ where pollen-specific tests on the resulting seed would be conducted.

c) External review

[584] On 18 October 2006 and 2 November 2006 Dr Pearson sent Dr Clover his comments on the draft PHEL Review, including:

- (a) The title page needed a statement about the type and purpose of the document in order to set the context. He queried whether the purpose was to provide background information for policy decisions by MAF which would have a different emphasis than if it was a review written for a scientific journal.
- (b) In relation to the “bacteria, mollicutes and fungi” section, Dr Pearson questioned the relevance of the end paragraph,³⁸¹ given it was not concerned with disease causing organisms. He considered the first sentence of the second paragraph³⁸² was possibly sufficient.
- (c) In relation to the section on “invertebrates”, Dr Pearson commented “[w]hat about transmission from pollen to healthy plants by insects (eg TSV and PRNSV)”.

[585] On 23 November 2006 Dr Card responded to Dr Pearson’s comments. He advised that he had removed the final paragraph in the “Bacteria, Mollicutes and Fungi” section, which Dr Pearson had queried the relevance of. On the section on invertebrates, Dr Card noted to Dr Pearson that this was concerned with invertebrates

³⁸¹ The first sentence of which said: “The only other reports in the literature that associate pollen and fungi are not concerned with mechanisms of transmission but [are] observations of pollen contamination by saprophytic species”.

³⁸² Which stated “there are limited number of reports on the association of fungi with pollen, most of which involve saprophytic species on a restricted number of plant hosts”.

being transmitted by pollen, not insects transmitting viruses to pollen. Transmission by vectors other than pollen were outside the scope of the report.

d) *PHEL Review finalised*

[586] Having responded to Dr Fernando and Dr Pearson, the PHEL Review was finalised on 23 November 2006. Dr Card had sent it to Dr Clover the day before (22 November 2006) to save it into MAF's system. The document as finalised was structured as follows:

- (a) Executive Summary;
- (b) Introduction;
- (c) Pollen Transmission;
 - 1. Invertebrates;
 - 2. Bacteria, Mollicutes and Fungi;
 - 3. General Discussion on Transmission of Viruses and Viroids;
 - 1. Viruses
 - 2. Viroids
- (d) Detailed information regarding the viruses and viroids that are transmitted by pollen (subheadings remained the same);
- (e) Pathogens specific for plant genera likely to be imported as pollen (subheadings remained the same, with the addition of "rubus" species);
- (f) References.

[587] The executive summary was as follows:

Pollen is a valuable source of germplasm for breeding and from a biosecurity perspective has relatively few pests and diseases associated with it compared to other types of genetic resource. The purpose of this review is to assist the risk analysis process by identifying the pests and diseases that are transmitted by pollen. There are a limited number of reports on the association of fungi with pollen, most of which involve saprophytic species on a restricted number of plant hosts and there are no known bacteria, mollicutes or invertebrates that use pollen as a form of transmission. Thirty four viruses and five viroids have been identified as being pollen transmitted or associated with pollen, with the majority of these viruses belonging to the *Ilarvirus* and *Nepovirus* genera. Of these, no viroids and only eight viruses are associated with those plant genera that are most likely to be imported as pollen into New Zealand (*Actinidia*, *Malus*, *Pyrus*, *Ribes*, *Rubus* and *Vaccinium* species).

[588] The section on bacteria, mollicutes and fungi said:

2.1.2 BACTERIA, MOLLICUTES AND FUNGI

There are no known bacteria or mollicutes that are pollen transmitted (Nemeth, 1986b). There are a limited number of reports on the association of fungi with pollen, most of which involve saprophytic species on a restricted number of plant hosts. Examples involving plant pathogenic fungi include: (i) pollen grains of rapeseed (*Brassica* spp.) were found to be heavily contaminated with ascospores of *Sclerotinia sclerotiorum* (Stelfox *et al.* cited in Li *et al.*, 2003), which were found to be transported by honey bee vectors to healthy plants resulting in head blight of rapeseed and (ii) *Verticillium albo-atrum*, which causes wilt of alfalfa (*Medicago sativa*), which is also known to be spread by pollen and insect vectors (Huang, 2003). The severe strain of *V. albo-atrum* is regulated in New Zealand, but the hop and lucerne strains are not regulated.

The only other reports in the literature that associate pollen and fungi are not concerned with mechanisms of transmission but observations of pollen contamination by saprophytic species, for example Śpiewak *et al.* (1996).

Kiwi Pollen

a) First approach (export inquiry)

[589] While the PHEL Review was underway Kiwi Pollen made its first contact with MAF. This concerned an application Kiwi Pollen was making to export male kiwifruit pollen to Argentina for use in kiwifruit production. On 8 August 2006 Jill Hamlyn, from Kiwi Pollen, contacted Mr Hartley by email asking MAF to endorse a list of answers she was providing to SENASA (NPPO for Argentina).³⁸³ The questions from SENASA and answers from Kiwi Pollen included the following:

³⁸³ Mr Hartley had moved to Plant Imports from Exports in late 2006 but was still doing work across both roles for a period. This was likely to be in his capacity in the Exports team.

...

2 Which recollection process has been used with the pollen?

Pollen is extracted from closed male flower buds. Buds are harvested before flower opening, which means that no insects or animals will have entered the flower.

...

6 [Phytosanitary] problems that affect the specie of the pollen wishing to import

None. The pollen is pure, and frozen at minus 18°Celsius.

...

8 Describe the process to which the pollen undergoes from the time of collection to the time it is exported

Closed male flower buds are collected by hand in fine weather. The male buds are then macerated, dried and the pollen extracted by a machine. The dry pollen is then stored frozen at minus 18° Celsius. Because the flowers are not open when harvested, the pollen has not been in contact with any bees or any other insect or animal. For this reason the pollen does not carry any contaminant.

[590] The content of this email is interesting because it asserted the pollen would be pure and would not carry contaminants. Hand collection of closed flower buds and freezing the pollen after extraction appear to be the basis for these assertions. In any case, Mr Hartley telephoned Ms Hamlyn about her email and then replied by email on 10 August 2006. He said that for MAF to endorse the answers it would have to be in a position to verify the accuracy of them. To a suggestion from Ms Hamlyn that AgriQuality confirm the accuracy of the answers, Mr Hartley said that AgriQuality does verify certification requirements on behalf of MAF but it would have to have supervised the collection/handling of the pollen.

b) First import request

[591] Kiwi Pollen's next contact with MAF was on 23 November 2006, the same day as the PHEL Review was finalised. This time Kiwi Pollen made its first request to import *Actinidia* pollen. The request was made by email from Ms Hamlyn to Ms Dickson advising that:

Our company wishes to import frozen male kiwifruit pollen from Italy and China. Species: *Actinidia deliciosa* Var: Haywood.

The pollen is collected by milling unopened male flower buds, extracting the pollen and freezing.

The pollen will be used for pollinating kiwifruit in orchards in New Zealand.

We have not imported kiwifruit pollen before.

We have imported some Nashi pear pollen in the past.

Please would you advise the likely timeframe for obtaining a permit.

[592] Ms Dickson replied by email to Ms Hamlyn on the same day, copying Mr Hartley, stating that MAF “will advise soon whether this will be possible, or if an assessment by MAF must be done first”. Before Ms Dickson had the opportunity to respond further, on 6 December 2006, at 11.10 am, Ms Hamlyn forwarded to Mr Hartley a copy of the email she had sent to Ms Dickson of 23 November 2006 requesting to import frozen male kiwifruit pollen. Her forwarding email simply stated “FYI, Wayne”. Mr Hartley replied to Ms Hamlyn, copied to Ms Dickson, on the same day stating “Thanks Jill”.³⁸⁴

[593] The email from Ms Hamlyn to Mr Hartley appears to have prompted Ms Dickson to contact Dr Clover for his assistance. One minute after Ms Hamlyn’s email to Mr Hartley, at 11.11 am, Ms Dickson emailed Dr Clover, apologising for contacting him, noting that Ms Hains was away, and stating:

We have the company Kiwifruit Pollen Ltd, wanting to bring in pollen, and I know this has been discussed in the past but just can’t recall how we handled it. There does not seem to have been any permit issued, but the importer is of the opinion that they have been allowed to in the past.

Can you recall anything off the cuff? Or can you give any info about a current risk analysis?

³⁸⁴ Ms Dickson did not recall any particular reason why it would have taken her almost two weeks to take any action on Kiwi Pollen’s request for a permit to import kiwifruit pollen. Mr Hartley did not remember whether Ms Hamlyn forwarding him a copy of Kiwi Pollen’s initial request email to Ms Dickson almost two weeks later constituted a follow-up email or not. Mr Hartley considered that the delay in getting back to Ms Hamlyn might have been due to either: Ms Dickson being away; discussion taking place between the permit groups in the intervening period between 23 November and 6 December; or Ms Dickson being busy with other more pressing matters.

[594] At 11.32 am Ms Dickson sent a separate email to Dr Clover stating “the attached email explains a bit more about what they want”. This attached Ms Hamlyn’s email to Ms Dickson of 23 November 2006 explaining that pollen was collected by milling unopened male flower buds, extracting the pollen and then freezing it, and that the pollen would be used for pollinating kiwifruit in orchards in New Zealand.

[595] Dr Clover replied to Ms Dickson’s 11.32 am email (this email was below his reply) on 6 December 2006 at 6.07 pm. His email was copied to Dr Card, Dr Lia Liefting, Mr Hartley and Dr Herrera. His reply was as follows:

No problems with contacting us about this – we are happy to help.

I do have a memory about HortResearch discussing the possibilities of importing pollen but I think this was an inquir[y] about what the requirements might be and I think they decided to import only seed – in any case I am not aware of any permits being issued. I have copied this to Veronica [Dr Herrera] in case she has any further recollection[.]

I have not heard of the company Kiwifruit Pollen Ltd but it’s an interesting request and certainly pollen as a source of germplasm is likely to become increasingly important. Because of this we have recently completed an extensive literature review on pests and diseases that are associated with pollen, the report was peer-reviewed internally by Ops Stds (Tamsin) [Ms Hains] and Risk Analysis and externally by the University of Auckland. It’s available on ECMS here: [website reference].

As you will see there are no pests or diseases known to be associated with pollen of *Actinidia* spp.

I would be happy to discuss further – please keep me informed how you decide to proceed with this permit application since it is very relevant to the PEQ GIF initiative.

[596] Ms Dickson’s evidence was that she asked Dr Clover’s advice because he was the previous team leader for Plant Imports, he had also been the senior advisor for Nursery Stock, and he was “one of the more competent people”. She understood that milling would involve breaking plant material, and in particular flowers, into small pieces. She assumed that pollen would be extracted and removed from the rest of the milled matter, but she did not have the technical expertise to be sure about that. She thought Dr Clover would draw his own conclusions about whether there would be plant material in the pollen.

[597] Dr Clover's evidence was that he was unaware when he responded to Ms Dickson that there was a milling process involved in the pollen that Kiwi Pollen wished to import, or that the pollen would be used to pollinate kiwifruit orchards. He suggested this was because he had either failed to open the attachment to Ms Dickson's 11.32 am email (which forwarded Ms Hamlyn's request) or he had failed to read it. He said it was evident he had not read the full content of the attachment because his response referred to pollen being "a source of germplasm" and it being relevant to the PEQ GIF Initiative. Dr Clover considered that, if he had opened, read and understood the attachment, he would have pointed out to Ms Dickson that the PHEL Review only related to pollen imported as a source of germplasm and possibly he would have referred Ms Dickson to the introduction to the report which discussed this.

[598] In any case, unaware that Dr Clover had not read her 11.32 am email which stated the purpose of the pollen was to pollinate kiwifruit orchards in New Zealand, on 8 December 2006 (at 11.53 am) Ms Dickson emailed Ms Hamlyn, copying Mr Hartley stating:

This matter has been discussed further within the group and it has been agreed that hand collected, unopened male flower buds of kiwifruit may be collected, milled and imported. We will be requiring that consignments be accompanied by government issued phytosanitary certificate that the male flower buds were hand collected and unopened.

A permit to import will be required. As we don't have an application form exactly applicable for pollen we will use the email trail instead. Could you please confirm that the unopened flowers are milled in Italy, rather than here after arrival. Also please advise that you are willing to pay the \$105 permit fee and how you wish to pay it. We accept Visa/MasterCards or you could post in a cheque made out to MAF.

[599] A number of witnesses were asked who "within the group" referred to. In my assessment they were doing no more than guessing who the discussion had been with. There were no notes of a group meeting and it is not likely that witnesses would accurately recall the discussion held over 10 years ago. I return to this shortly.

[600] Ms Hamlyn replied to Ms Dickson at 12.32 pm, approximately half an hour after receiving her email advising that the pollen could be imported. Ms Hamlyn said it was "great news". She asked for confirmation that it also applied to pollen from China (noting that Ms Dickson's email had only mentioned Italy in the email). She

clarified the milling location by saying “the flower buds must be milled within 18 hours of harvesting, therefore they are always milled in the location they are harvested, and the pollen [is] processed there”. She arranged payment of the permit fee by credit card. Ms Dickson replied at 3.18 pm confirming the permit application could include China and asking Ms Hamlyn if she was confident about obtaining a phytosanitary certificate.³⁸⁵

[601] There must have been some further discussions about the request because on 12 December 2006 Ms Dickson informed Kiwi Pollen that it would also be necessary to include a condition for microscopic inspection.³⁸⁶ This condition was consistent with the earlier discussion involving Ms Cooper, Dr Sathyapala and Dr Herrera that pollen imported into PEQ for germplasm purposes would be microscopically inspected. Ms Dickson’s email to Kiwi Pollen on 12 December 2006 was as follows:

Further to our advice last week that we would like a declaration on the phytosanitary certificate, we now have considered that a further declaration will be required to give confidence about the pollen. So this will mean the following phytosanitary declarations will be on the permit:

1. The milled pollen has been sourced from hand collected, unopened male flowers.
2. The pollen has been microscopically inspected and found free of regulated organisms.

Could you please advise that the respective government organisations will be able to provide these declarations? ...

[602] This email was not sent to Ms Hamlyn as part of the previous chain of communications between Ms Dickson and Ms Hamlyn.

[603] On 10 January 2007 Mr Hartley asked Ms Dickson to forward him the finalised conditions that were sent to Ms Hamlyn. He asked if it was common practice to confirm conditions via email and not to create a permit. He asked whether MAF needed a specific permit template for pollen.

³⁸⁵ Mr Hartley was not copied on the email from Kiwi Pollen or Ms Dickson’s reply to it. Mr Hartley did not recall whether Ms Dickson discussed this with him but as it had already been discussed within the group, she may not have.

³⁸⁶ Ms Dickson also could not recall who was involved in the decision communicated to Ms Hamlyn on 12 December 2006. She thought Dr Clover may have provided this advice and Ms Hains, Mr Hartley and Ms Cooper were probably aware of it. Again, this was a guess, but seems likely that at least one of Ms Cooper, Dr Sathyapala or Dr Clover were involved in this.

[604] Ms Dickson replied to Mr Hartley later on 10 January 2007. She advised Mr Hartley of her 12 December 2006 email and noted Ms Hamlyn had not yet responded. As to Mr Hartley's query about permit conditions and a permit template, she said:

Some indication of permit conditions has to be given when we have no specific standard. A permit still needs to be created (this does not have to be done by me of course, you might like Chris [Baring] to prepare it). We could consider having a specific permit template for pollen, if imports are more likely than in the past.

[605] Nothing was heard further from Kiwi Pollen until 20 March 2007 when Ms Hamlyn replied to Ms Dickson's 8 December 2006 email which had asked whether she could get a phytosanitary certificate from China. Ms Hamlyn's reply was to say that, after a break, she wished to continue the process for the pollen permit and she was not absolutely sure Kiwi Pollen could get a phytosanitary certificate endorsed in either Italy or China, but Kiwi Pollen's colleagues in each of those countries were working on that and were confident it would happen. She also said that Kiwi Pollen was planning to import the first pollen in 2008 or 2009.

[606] Ms Dickson replied to Ms Hamlyn that day, copying Mr Baring, suggesting that it would be best that Mr Baring took over the permit preparation as he was now preparing all the nursery stock permits. She said she would hand him all the previous messages on the topic. In her evidence Ms Dickson explained that, at this time, most of the nursery stock permits were being handed over to Mr Baring, who was a technical advisor working predominantly with Mr Hartley at this time. This was because they were dividing up areas of work within the team.

c) The permit

[607] On 29 March 2007 Ms Hamlyn submitted a completed permit application. The permit described the exporter as Bexley Inc from China or Japan. The country of origin was described as "China". The country of export was described as "China maybe Japan". The purpose of importation was described as "commercial kiwifruit pollination". The type of product was described as "male kiwifruit pollen (*Actinidia deliciosa*) frozen". The transportation/packaging was described as "air freight, packed in polycarbonate jars or plastic bags, frozen in polystyrene outers". The quantity or

frequency of import was described as “approximately twice per year in June & July”. The manufacturing process was described as “closed male flower buds are harvested, macerated dried, and the pollen extracted by machine, then stored at -18 °C”.

[608] On 16 April 2007 MAF issued the permit to Kiwi Pollen. The details were as follows:

2007031028 - Import permit

MAF Ministry of Agriculture and Forestry, New Zealand
Te Manatu Ahuwhenua, Ngāherehere, Aotearoa

PERMIT TO IMPORT NURSERY STOCK

This permit is issued under the Biosecurity Act, 1993. Any queries, please contact Biosecurity Standards (Plants), MAF Biosecurity New Zealand, P O Box 2526, Wellington, (Phone 04 819 0667, Facsimile 04 819 0662)

Authorising Officer: Susan Cooper, on 16 Apr 2007
for Director General, Ministry of Agriculture & Forestry,
Biosecurity New Zealand, acting under delegated authority.

NOTE: Total number of pages for this permit is _____
Please ensure all pages (front pages, any appendices and attachments) are included with copies.

Permit for : Kiwi Pollen NZ Ltd PO Box 761 Te Puke New Zealand Attention : Jill Hamlyn	Permit No : 2007031028 Replaces Permit No : N/A Expiry Date : 16 Apr 2008 No of Consignments : Multiple Import Purpose :						
Establishment No :							
Exporter Name : Bexley Inc China							
Descriptive Name : Frozen Kiwifruit pollen Type of Material : Pollen Comments :	Quantity : Unlimited Measure : Units						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%;">Genus</th> <th style="width: 33%;">Species</th> <th style="width: 33%;">Cultivar</th> </tr> </thead> <tbody> <tr> <td>Actinidia</td> <td>deliciosa</td> <td></td> </tr> </tbody> </table>	Genus	Species	Cultivar	Actinidia	deliciosa		
Genus	Species	Cultivar					
Actinidia	deliciosa						
Standard 155.02.06, Importation of Nursery Stock							
Special Conditions : Only hand collected, unopened male flower buds may be collected, milled and imported. Consignments must be accompanied by a government issued phytosanitary certificate stating that the male flower buds were hand collected and unopened.							

Permit No: 2007031028 Page 1 of 2

MAF Ministry of Agriculture and Forestry, New Zealand
Te Manatu Ahuwhenua, Ngāherehere, Aotearoa

IMPORTANT INFORMATION FOR PERMIT HOLDERS AND AGENTS

- 1 This permit, and compliance with the provisions of the specific import health standard(s) under entry conditions, does not guarantee that the goods you import will be given a biosecurity clearance. There are other restrictions in the Biosecurity Act 1993 which apply to the giving of biosecurity clearance.
- 2 You need to ensure that the goods you import comply with the provisions of the specific import health standard(s) and/or entry conditions. The import health standard may be amended during the course of your permit. Import Management will notify you of any significant changes to the import health standard and will re-issue the permit to accommodate these changes.
- 3 There are a number of other provisions in the Biosecurity Act 1993 which may affect you. If you commit an offence against the Biosecurity Act 1993, heavy penalties under section 157 of the Act might apply.
- 4 Apart from the Biosecurity Act 1993, there are other laws relating to or prohibiting the importation of goods. This permit, and compliance with the provisions of the specific import health standard(s) and/or entry conditions, does not absolve you of the need to comply with these laws.
- 5 Unless specifically identified in 'Description of Items' or 'Special Conditions' of the permit, NO new organisms, including genetically modified organisms, are permitted entry under this permit.
- 6 All cultures must be:
 - clearly labelled with the scientific strain and name
 - contained in leakproof packaging
 - free from contaminants

Permit No: 2007031028 Page 2 of 2

KIWI.005.0253

d) What happened to the microscopic inspection condition?

[609] It is presumed, based on Ms Dickson’s email to Ms Hamlyn on 20 March 2007, that Mr Baring prepared the permit. It can be seen that the permit did not contain a condition requiring that the pollen be microscopically inspected as had been indicated in Ms Dickson’s 12 December 2006 email to Ms Hamlyn. Mr Baring had no direct recollection of preparing the first Kiwi Pollen permit. He accepted it was likely that he had prepared it, with Mr Hartley reviewing it and Ms Cooper as the authorising

officer.³⁸⁷ He was not able to give any estimate of the volumes of permits in the plant context.

[610] Ms Dickson's evidence was that over the course of a year she had probably handed a few hundred permits to Mr Baring. She said she was likely to have handed over all the previous messages on the Kiwi Pollen matter as paper copies. She thought she would "probably" have printed them out but she may have transferred them by email. Her 20 March 2007 email to Ms Hamlyn had included the earlier email chain but not the separate 12 December 2006 email which added the microscopic inspection condition. She said she "may well have" provided the 12 December 2006 email, and she could not "remember exactly but it would seem logical" that she would have provided Mr Baring with this email. Ms Dickson thought it was likely a decision was made to drop the microscopic inspection condition on the basis of what was known at the time that there were no associated diseases with pollen. Although Ms Dickson was very experienced and competent at her job, and quite a careful and precise person, she obviously could not know at this distance whether she had provided the 12 December 2006 email and there was no documentary record to suggest that she did. Nor could she say whether a decision was in fact made to remove the microscopic testing condition or whether it was an error arising from the handover to Mr Baring.

[611] Mr Baring did not recall what he had been provided with. He said the practice at the time was to keep a physical file with hard copies of the relevant correspondence, but the physical file would only start once a permit application had been made. He did not recall seeing Ms Dickson's email of 12 December 2006 and did not know why the microscopic inspection condition was not included in the permit. His recollection was that permits were a group process. He was a technical advisor and therefore did not make the decisions on conditions. Communications were often oral. His desk was near Mr Hartley's but Ms Dickson's desk was down the opposite end, with the Fresh Produce and Seeds people in between. Based on usual practice he thought that, because there was not a risk analysis for pollen, the Plant Imports team would have looked to RAG for some guidance. This would normally be from someone senior, such as Dr Sathyapala or Dr Ormsby, and Dr Clover even though he was in PHEL.

³⁸⁷ He accepted that the same process was likely for the HortResearch importing pear pollen permit mentioned later.

[612] Mr Baring said that when he joined Plant Imports there had been a period of high staff turnover. They had eight new staff and this meant they had lost a lot of institutional knowledge. Ms Dickson, however, had been around a long time and knew how to assess the risk of all sorts of things. It was very busy and he considered they were understaffed. They had a team of eight or nine people in Plant Imports doing what a whole floor of personnel in Australia would do. MAF did not provide specific training on assessing risks. A judgment call was required. It was his view that contamination risks were relevant at all stages (risk analysis, permit conditions and inspection at the border).

[613] Mr Hartley could not recall why the microscopic condition was not included. He accepted it was possible that it “fell off the radar” but it was more likely in his view that the potential risks were further assessed, possibly based on the PHEL Review, which indicated there were no known phytosanitary risks with *Actinidia* pollen. Mr Hartley thought that there would not necessarily have been a hard copy file of the documents relating to the permit. He would have thought there would have been an electronic file as, by that time, they had a document management system in place. However he would not have been surprised if Ms Dickson’s practice was to keep a physical file as she was quite “old-school”. He thought that by the time he initialled the permit, there must have been an actual physical copy.

[614] Mr Hartley said the process was for him to peer review the permit and initial them for Ms Cooper to sign off. Ms Cooper would probably just expect to get a copy of the permit from Mr Hartley when she was required to sign one off. If she had additional questions, it would be up to her to raise them with Mr Hartley. Depending on the nature of the request and the commodity, there could be a discussion with her. For some permits she would have had some involvement and had a degree of knowledge about what was happening. But for other permits she might not.

PHEL Review to be published externally

[615] Meanwhile, it had been decided that the PHEL Review might be turned into a manuscript and submitted for publication in a scientific journal. On 23 November 2006 Dr Card emailed a first draft of a manuscript for independent publication,

prepared on the basis of the PHEL Review, to Dr Pearson. Dr Clover could not remember the precise date they decided to try to publish the literature review in a peer-review journal. The thinking was that there had been no review on this topic for a number of years and it would also mean that the paper would be reviewed by independent scientists which Dr Clover considered would increase the paper's quality.

[616] On 24 November 2006 Dr Pearson provided some further comments on the draft manuscript to Dr Card, copying Dr Clover and Dr Herrera. These related largely to style and there were no substantive changes made to the section on bacteria. On 6 February 2007 Dr Clover sent Dr Pearson further amendments to the manuscript for the published version of the PHEL Review for him to consider. This included the following:

(a) In the Abstract:

[t]here are no bacteria, mollicutes or invertebrates that are pollen-transmitted.

(b) In the Introduction:

Pollen is a valuable source of germplasm for breeding purposes. From a biosecurity perspective pollen has relatively few pests and diseases associated with it, these being a sub-set of those pathogens which affect plants for planting and seed. ... The purpose of this review is to assist countries develop appropriate phytosanitary measures by identifying the pests and diseases that are transmitted by pollen.

(c) The sections on "invertebrates" and "bacteria, mollicutes and fungi" were merged. A number of stylistic amendments were made to this section. Additionally the sentence referencing the Nemeth publication was amended by removing the reference. It stated:

There are no pollen-transmitted bacteria or mollicutes but there are a few reports of fungi associated with pollen, most of which involve saprophytic species on a restricted number of plant hosts.

[617] On 8 February 2007 Dr Pearson replied suggesting a few small changes and making suggestions about the journal to which the manuscript might be submitted.

[618] Dr Clover had arranged for the PHEL manuscript to be reviewed by two team members in early 2007. This was in accordance with PHEL's quality control system. The two PHEL team members were Bénédicte Lebas (then the senior scientist in the mycology, bacteriology and virology team) and Dr Liefing (who was a senior scientist in the team). Ms Lebas provided her comments on 7 March 2007. Her comments included that the conclusion was a "very light discussion" and she asked "what about all viruses that do not have data on pollen transmission but could potentially become pollen transmitted?" Dr Liefing provided her comments some time before 14 March 2007 (Dr Clover cannot recall the precise date). Her comments included a suggestion to define "mollicutes" as not everyone was familiar with this term.

[619] Dr Clover submitted the manuscript (the Card Paper) to *Plant Pathology* on 29 March 2007. On 17 May 2007 he was advised by the senior editor of *Plant Pathology* (Richard Shattock) that the Card Paper was unacceptable for inclusion in the journal. Mr Shattock advised that he obtained three reports on the paper. He summarised the comments as follows:

Reviewer#1 commented "the paper seems motivated by quarantine concerns but goes for a more in vogue term "biosecurity" without much attempt to put these issues into the main thrust of the review". Key references on seed transmission should be added and the reviewer commented that French studies on pollen of fruit crops (PDV, PNRSV) should be added with expansion and an attempt to liven the text then this reviewer thought it might be acceptable.

I regret to say that reviewer #2 was not impressed.

Reviewer #3 thought that whilst the tables and references were useful collations, no new information was provided by the review to assist risk analysis. The reviewer thought the original articles and not this review would be consulted by workers in this field or by pest risk analysts.

[620] He then said:

My own view as editor was that:

1. The title was inappropriate as it concentrated on viruses and viroids.
2. Novelty is needed, e.g. how is pollen used in breeding programmes apart from its conventional role and how much risk is identified from assorted viruses and viroids? Has biosecurity actually been threatened?
3. It runs out of steam ending abruptly and rather timidly after 10 pages.
4. It comes across as just a list, albeit a useful list.

I regret I cannot accept this manuscript for publication but would be willing to consider a resubmission if you can inject something extra, perhaps by reconsidering what precisely your aims and objectives are, and how a review of this interesting subject can inject a new angle into the current literature.

[621] The email to Dr Clover also provided the reviewers' comments in full. Reviewer number two said:

The review lacks originality, novelty, analysis and scholarship. In other words it is a routine review which adds very little to the prior art – even though it covers many of the pertinent facts. The number of reference cited is surprisingly small given the diversity of available literature. However, it is the lack of novelty of approach and detailed discussion that I find inappropriate.

R.E.F. Matthews is the correct spelling (two “TTs”).

[622] On 2 June 2007 Dr Clover circulated to Dr Pearson and Dr Card a revised version of the Card Paper which he considered had taken into account the comments from the *Plant Pathology* reviewers. He asked for their comments with a view to submitting the Card Paper to the Australasian *Plant Pathology* journal. These revisions made no material changes to the section on “transmission of invertebrates, bacteria, mollicutes and fungi”. Dr Pearson provided his comments on 5 June 2007. Again, this did not involve any material amendment to the transmission of invertebrates, bacteria, phytoplasmas, spiroplasmas and fungi section (as is apparent from the final version).

[623] Dr Card replied on 7 June 2007. He said he believed the paper read well and was now exceptionally concise. He provided a few comments. Again, no material amendments were made to the “transmission or invertebrates bacteria, phytoplasmas, spiroplasmas and fungi” section.

[624] On 7 June 2007 Dr Clover submitted the Card Paper for consideration for the Australasian *Plant Pathology* journal. On 12 June 2007 the editor of Australasian *Plant Pathology* replied to Dr Clover stating that the Card Paper had been reviewed by an overseas reviewer and attaching some minor changes. Dr Clover incorporated these changes and sent the paper back to the editor on 14 June 2007. No material amendments were made to the “transmission or invertebrates bacteria, phytoplasmas, spiroplasmas and fungi” section. The paper was accepted on 18 June 2007.

[625] In September 2007 the Card Paper was published in the Australasian *Plant Pathology* journal. The authors were listed as (in order) Dr Card, Dr Pearson and Dr Clover.³⁸⁸

[626] The abstract stated:

Pollen is a valuable source of germplasm for breeding and has few associated pests compared with other sources of genetic material. This review seeks to assist the development of appropriate phytosanitary measures by considering the pests that are transmitted by pollen. There are no invertebrates, bacteria, phytoplasmas or spiroplasmas that are pollen-transmitted. Only a limited number of fungal pathogens are associated with the pollen of a restricted number of hosts. In contrast, 39 viruses are pollen-transmitted and a further six are tentatively considered to be pollen-transmitted. The majority of these viruses belong to the *Alphacryptovirus*, *Ilavirus*, *Nepovirus* or *Potyvirus* genera. Five viroids have also been identified as being pollen-transmitted.

[627] The introductory section discussed the process of pollination. It stated that, as plants and plant pathogens have co-evolved, the pathogens have developed transmission mechanisms, which are frequently correlated with their taxonomy. It provided some examples. In relation to bacteria it said:

... Bacteria commonly rely on water splash, which is often aided by air currents or insects. Bacteria are usually unable to penetrate new hosts directly and rely on natural openings and wounds to gain entry to the plant intercellular spaces. ... Some viruses and viroids have also evolved mechanisms that exploit the plants' own reproductive processes and can be transmitted by seed and/or pollen (Mink 1993; Johansen *et al.* 1994; Hull 2004b).

[628] It also said:

Pollen is a valuable source of germplasm for breeding purposes. From a biosecurity perspective, pollen has relatively few pests associated with it, compared with those that affect plants and seeds. ...

[629] The next section following the introduction stated:

Transmission of invertebrates, bacteria, phytoplasmas, spiroplasmas and fungi

There are no reports of arthropods, nematodes or insects being transmitted by pollen at any stage of their lifecycles. However, many insects are vectors for

³⁸⁸ The ordering of the authors, within the context of this paper, signified the first named author (Dr Card) as the person who had done the most work and had been responsible for the project while the final named author (Dr Clover) was the most senior author and had been responsible for its oversight.

plant viruses and some may contaminate pollen with viruses when feeding, e.g. thrips, pollen beetles and honey bees (Brunt *et al.* 1996).

There are no pollen-transmitted bacteria, phytoplasmas or spiroplasmas, but there are a few reports of fungi associated with pollen, most of which involve saprophytic species on a restricted number of plant species. In studies on plant pathogenic fungi, Stelfox *et al.* (1978) reported that pollen of rapeseed (*Brassica* sp.) heavily contaminated with *Sclerotinia sclerotiorum* ascospores was carried by honey bees to healthy plants causing head blight. Huang (2003) observed that *Verticillium albo-atrum*, which causes wilt of alfalfa (*Medicago sativa*), can be spread by pollen and insect vectors. The only other reports of pollen-associated fungi are observations of pollen contaminated by saprophytic species and are not concerned with transmission (Śpiewak *et al.* 1996).

[630] It then discussed the transmission of viruses and viroids which took up the majority of the paper. This included a discussion on horizontal and vertical transmission.

[631] The conclusion began with the following statement:

Compared with alternative sources of genetic material such as seeds or plants, pollen is affected by few pests. Therefore, it constitutes a relatively safe medium in which to move genetic material internationally or for use in breeding programs. As described here, there are no invertebrates, bacteria, phytoplasmas or spiroplasmas that are pollen-transmitted and only a limited number of fungi are associated with pollen. ...

RAG sign-off of PHEL Review

[632] While the PHEL Review was being worked on for independent publication, further pollen import requests had been received.

[633] On 26 February 2007 Mr Baring received a request from a Mr Richards who wished to import apple and pear pollen for use in his orchard in Nelson. It was proposed that the pollen would come from the United States, where the practice of artificial pollination was common. Mr Baring replied to this request on 28 February 2007 enclosing a link for an import permit application form. Mr Baring also advised that, as these are high value crops, MAF would need to check the risk of transmission of viruses and draft appropriate measures.

[634] On 27 February 2007 Mr Hartley emailed Dr Clover, copying Mr Baring, seeking clarification on the viruses associated with *Ribes* (currants). He asked whether

a principled measure would be that the plants from which the pollen was collected be tested for the specific viruses of concern and asked if Dr Clover had any further information about this. He also noted that MAF had received a similar request for pollen of *Malus* and *Pyrus* (apple and pear). Dr Clover replied on 28 February 2007 (copying Dr Liefting and Mr Baring) setting out the pathogens affecting *Ribes* pollen. He also said:

In terms of import conditions we have in the past required testing of seed derived from plants fertilised in NZ but an alternative option might be for the exporting country to certify that the mother plants were free of the disease. Another option (which would provide more security) is to allow importation of unopened flower buds containing pollen and then test the tissue from the mother plant on arrival in NZ.

[635] On 28 February 2017 Mr Richards provided to Mr Baring the completed application form. On 2 March 2007 Mr Baring responded to Mr Richards. He referred to the process used in the past to test seeds derived from plants fertilised in New Zealand. He also explained that MAF was exploring another option of allowing importation of unopened flower buds containing pollen and then testing the tissue from the mother plant on arrival in New Zealand. He said that MAF was looking to update its risk analysis document in light of a review that had been undertaken by PHEL. This could alter testing requirements but still had to go through a peer review process and sign-off before existing requirements could be changed. He advised Mr Richards to hold off his application “until the path of least resistance forward can be found”.

[636] On 3 March 2007 Mr Hartley emailed Dr Clover advising that HortResearch wished to import *Pyrus* pollen and were intending to use the pollen to produce seed under a temporary PEQ facility (a tent around a tree) and then grow the seedlings out in a level three or level two facility. Mr Hartley also said that another importer wished to bring in seven kg of *Malus* pollen. He also said that “[w]e have run into a bit of [a] hitch with the manuscript and Chris [Baring] will follow up with you on this shortly”. Dr Clover replied to Mr Hartley later that day. Dr Clover, who was in Canada at the time, noted he was visiting world experts in virus and virus-like diseases of pip and stone fruit and would be discussing pollen transmission of pathogens in *Malus* and *Pyrus*. He also said “[a]re you sure an importer wishes to bring seven KILOS of *Malus* pollen – seems rather a lot!!”. He asked what the “hitch” was with the manuscript.

[637] On 5 March 2007 Mr Baring emailed Dr Clover, copying others including Mr Hartley, confirming that MAF had a private importer who had applied to import five kg of *Malus* and three kg of *Pyrus* pollen. He explained the “hitch” with the manuscript as follows:

Regarding the Hitch with the manuscript. Had a chat with Shiroma [Dr Sathyapala] about utilising the manuscript over the PHEL Review as a basis for considering which pathogens are pollen transmissible. It would appear that in order to use the most up to date information contained within the manuscript we will need to incorporate this into the review document. Once incorporated it will require sign-off from RAG before we can utilise this information in a risk analysis capacity.

[638] Mr Baring asked if Dr Clover, or someone from PHEL, could summarise the changes and merge the two documents so that RAG could give their seal of approval. Mr Baring’s evidence was that this arose because Dr Clover had advised Mr Hartley that Plant Imports should refer to the Card Paper manuscript rather than the PHEL Review when considering pathogens that are pollen-transmitted. However Dr Sathyapala had said the manuscript could not take precedence as it had not been signed off by RAG.

[639] Dr Clover replied by email dated 6 March 2007 as follows:³⁸⁹

That’s interesting about the apple and pear pollen import request – quite a different application from the usual one for breeding purposes.

Re the “hitch” – that’s fine, will get this sorted – was thinking we should do this for completeness anyway. ...

[640] Dr Clover provided Mr Baring with a revised version of the PHEL Review, incorporating the new information on 14 March 2007. He emailed Mr Baring the website link to the saved revised version. The next day Mr Baring thanked Dr Clover for his quick response and said he would forward it to RAG for sign-off. He forwarded this to Dr Sathyapala on the same day asking for sign-off. Dr Sathyapala also replied on this date saying that she would look at the new information and arrange the sign-off. She noted the agreement for an external review of the final document and asked

³⁸⁹ Dr Clover’s response about the size of the apple and pear pollen import provides support for his evidence that he had understood from Ms Dickson’s query that the pollen import from Kiwi Pollen was to be for breeding purposes rather than commercial application and that he missed the advice that it was for commercial application.

for the details of the external review. Mr Baring replied to Dr Sathyapala on the same day querying what she meant by the external review. He understood the new document would only be internally reviewed by RAG. He said that going out for external review would further delay the process for the two permit applicants. Dr Sathyapala left a voice message for Dr Clover about this. Dr Clover replied by email on 15 March 2007 saying that the paper had been reviewed by Dr Pearson. He attached Dr Pearson's email of 8 February 2007 which had provided some suggested changes.

[641] Dr Sathyapala asked Dr Lihong Zhu (a senior analyst in her team) to review the part of the PHEL Review about *Malus* (apple) pollen. Dr Zhu had recently worked on risk assessment for the *Malus* schedule to the Nursery Stock IHS and so had good knowledge of the pests and diseases transmitted by *Malus* nursery stock. Dr Sathyapala provided the PHEL paper to Dr Zhu by email dated 20 March 2007 saying “[c]ould you please have a look at the *Malus* pollen part and let me know your comments”.

[642] On 26 March 2007 Dr Zhu provided her comments on the updated PHEL Review to Dr Sathyapala. She had “no big problem with the document”. However she commented that while a particular virus was of negligible risk for the *Malus* budwood pathway, this was quite different from the pollen pathway and the virus should be regulated for *Malus* pollen. Dr Zhu provided further comments to Dr Sathyapala on the updated PHEL Review on 27 March 2007. This email followed a discussion between Dr Zhu and Dr Sathyapala (where Dr Sathyapala presumably asked her to also look at the *Pyrus* section). Dr Zhu noted that she had found several viral pathogens recorded for *Pyrus*. One of them “reported pollen transmitted but the evidence is inconclusive”. She noted it was listed in the *Malus* part of the review but wondered why it was not mentioned in the *Pyrus* part. She noted that the other six viral pathogens were not included in table one of the PHEL Review.

[643] On 27 March 2007 (at 10.53 am) Mr Baring emailed Dr Sathyapala, copied to Mr Hartley, asking how the internal review of the PHEL Review was progressing. Dr Sathyapala replied by email at 1.20 pm that day advising of Dr Zhu's comments and that she would need to discuss them with Dr Clover. On 28 March 2007 Dr Sathyapala provided Dr Zhu's comments on the PHEL Review to Dr Clover.

Dr Sathyapala asked for Dr Clover's suggestions/comments as soon as possible so that the document could be finalised. Dr Clover replied on the same day, roughly 40 minutes later. He was happy to include the virus in the *Pyrus* section which had only been listed in the *Malus* part. He explained why another virus had not been included for pollen and agreed to make an amendment to the report to make this clear.

[644] On 10 April 2007 Dr Clover asked Mr Baring whether any permits for pollen had been issued recently, referring to the apple, pear and kiwifruit pollen requests that had been made earlier. Mr Baring replied on 13 April 2007 noting that the most recent permits issued were for *Pyrus* in 2003 for HortResearch. Dr Clover replied on the same day, asking what had happened to the recent requests for *Malus* and *Pyrus* pollen and whether he was still waiting for "sign-off" from RAG. Mr Baring responded to Dr Clover on the same day stating:

Shiroma [Dr Sathyapala] has given "sign-off" in the form of an email stating that RA are happy that PIT utilise information contained within the document to draft corresponding measures.

[645] Mr Baring also said that he was going to be drafting up the permits either that afternoon or early the following week. Consistent with this, Kiwi Pollen's permit was issued on 16 April 2007.

[646] It is unclear what had happened after Dr Zhu's peer review and the RAG "sign-off" referred to by Mr Baring. Dr Sathyapala said she discussed Dr Zhu's comments with Dr Clover. She said she also remembered looking through Dr Pearson's comments. She said "all these were discussed with the team including Dr Ormsby, Dr Zhu and Dr Fernando". However I did not find Dr Sathyapala's recollections of detail to be reliable. She was reliant, as all witnesses were, on what was recorded in the correspondence and other documents. There is no documentation indicating any discussion between Dr Sathyapala and Dr Ormsby or with Dr Fernando around this time. It is clear that Dr Ormsby was unaware of pollen imports at this time.³⁹⁰ If there was a discussion, it was likely to have centred around the proposed *Malus* and *Pyrus*

³⁹⁰ After the Psa outbreak he was surprised to learn that there had been pollen imports. There is documentation indicating that Dr Sathyapala obtained Dr Clover's response to Dr Zhu's comments.

pollen imports and that discussion was likely to have been with Dr Zhu and the outcome conveyed to Mr Baring, the person who had been chasing a response.

[647] There is no clear evidence about whether Dr Sathyapala discussed the Kiwi Pollen request with anyone before giving her sign-off for the Plant Imports team to use the PHEL Review to draft measures for imports. Dr Sathyapala considered it was very likely that she had discussed Kiwi Pollen's request with Dr Ormsby but could not recall the timeframe. However her explanation about this is more consistent with a recollection of an earlier discussion with Dr Ormsby relating to the PHEL Review which was not about Kiwi Pollen specifically. I accept Dr Ormsby's evidence that he had no knowledge of, and was not involved in, any consideration of Kiwi Pollen's request. Dr Sathyapala's internal review had focussed on the *Malus* and *Pyrus* requests and her internal reviewer, who knew about these fruits, had identified issues which were then corrected in the PHEL review before the sign-off. This suggests that Dr Sathyapala was not aware of the kiwifruit request. That could be explained by Mr Baring's correspondence with Dr Clover, which was also focussed on *Malus* and *Pyrus*. Moreover, Kiwi Pollen's request had already been approved back in December 2006.

[648] Ms Dickson thought that Mr Hartley (as he was copied on her email) and Ms Cooper (as team leader) would have been involved in the decision to grant Kiwi Pollen's permit application on 8 December 2006. She thought Ms Hains might also have been involved if she was around (but it is apparent from her email to Dr Clover on 6 December 2006 that she was not around). She did not recall speaking to Dr Sathyapala or Dr Ormsby. Mr Hartley had no specific recollection of the group discussion in December 2006 and thought that Ms Dickson, Mr Baring and Ms Cooper were likely to have been involved and Dr Sathyapala may possibly have been involved as well. He thought the group manager (Mr Gower-Collins) might have been there as well. He could not recall any discussion of milling or the risk that pollen would include extraneous material. Dr Sathyapala said she did not have any recollection of the date on which she was involved in a discussion about the Kiwi Pollen request but she knew that she had discussed it with Ms Cooper (manager of the Plant Imports team). She also suggested the possibility that she had talked to Clive Gower-Collins (group manager of BSG). Neither Ms Cooper nor Mr Gower-Collins gave evidence

so their recollections are unknown. However there is nothing to indicate that any of those discussions took place at the time the Kiwi Pollen permit was prepared rather than earlier (that is, in December 2006) when it was approved. Nor is there clear evidence that the earlier discussion involved anyone from BSG or RAG. I return to this later.

[649] On 26 April 2007 Mr Baring emailed Mr Richards, copied to Mr Hartley, advising that MAF had recently completed a review of regulated pests associated with pollen and was now in a position to determine the phytosanitary measures based on this review. He advised that the request for *Pyrus* pollen needed an additional declaration to the phytosanitary certificate stating:

The male flower buds that the pollen in this consignment originated from were hand collected and unopened.

[650] He said this would mean that “only hand collected, unopened male flower buds of *Pyrus* may be collected, milled and subsequently imported into New Zealand”. He said importing *Malus* pollen was more difficult because of two particular viruses that are regulated in New Zealand. Unless the exporter could gain official assurance (from the exporting country’s NPPO) that the pollen was collected from a pest free area, it was likely that testing and extensive quarantine, preferably offshore or on arrival, would be required.

[651] On 7 May 2007 MAF issued a permit for HortResearch to import pear pollen. The authorising officer was again Ms Cooper. Mr Hartley’s initials indicate he was the peer reviewer. The special conditions included that only hand collected, unopened flower buds could be collected, milled and imported and a phytosanitary certificate was required stating that the flower buds were hand collected and unopened. Mr Hartley said that he and Mr Baring sat beside each other at the time. He thinks there could have been a cross-desk discussion. He thinks that Mr Baring started to lead the whole pollen side of things around this time. Mr Hartley said he may have thought that, because the importer was HortResearch, it would probably go into a transitional facility.

[652] On 14 August 2007 Mr Hartley, as authorising officer, issued a permit to import clivia pollen to Mr Brundell covering a number of countries. The only special condition was that “on arrival the pollen is to be inspected for pests by an inspector of MAF Biosecurity New Zealand”.

Further Kiwi Pollen permits

a) *Vacuum collection proposal*

[653] Kiwi Pollen was next in touch with MAF about a new proposal on 17 May 2007. Ms Hamlyn emailed Mr Baring and Mr Hartley asking if she could meet with Mr Baring when she was in Wellington on 21 and 22 May 2007. She referred to the permit to import male kiwifruit pollen hand harvested from unopened flowers from China and Italy (in fact only a permit for China had been issued) and she wished to discuss the possibility and procedure for importing pollen collected by other means. She also wished to meet with Mr Hartley about meeting some pollen import requirements for Argentina.

[654] Mr Baring could not recall his communications with Ms Hamlyn at this time. However an email sent on 28 May 2007 from him to Ms Hamlyn, copied to Mr Hartley, referred to a meeting the previous week about the possibility of importing “vacuum collected” pollen from Italy. He said:

The current measure of importing pollen milled from hand collected unopened flowers is implemented to mitigate the risk of hitchhikers (eg fungi, bacteria) associated with visitation of invertebrate pollinators and wind dispersal. There are no regulated viruses of concern for Actinidia but it is however unknown what could be transferred once flowers open and what the bycatch could be from the vacuuming method. As I understand it extraneous organic material is sieved out during vacuuming but that this does not prevent material/organisms that are of similar dimensions than the pollen itself.

In order for the phytosanitary risks to be quantified my feeling is that we would need to undertake a pest risk analysis of the proposal so that we can enact measures with a degree of confidence. Basically there are too many unknowns for us outside the realm of regulated viruses to give an approval for this method of collection.

The problem with this path is time and possibly money. ...

[655] On 29 May 2007 Ms Hamlyn emailed Mr Baring saying she was seeking more information on vacuum collection which might shorten any risk analysis process. She

also asked if there was a user pays service for the risk analysis. Mr Baring replied on 30 May 2007 saying that there was a provision for self-funding a risk analysis if Crown funding was unavailable. He also said he was talking with the RAG to explore other options.

[656] On 5 September 2007 Ms Hamlyn emailed Mr Baring to find out if there had been any outcome from the RAG regarding her vacuum collected pollen request. Mr Baring replied on 6 September 2007 saying that RAG had not identified any alternative options and, in order to progress the matter, MAF would need more information about the proposed methods. The matter was not pursued further by Ms Hamlyn.

[657] On 7 December 2007 Kiwi Pollen applied for and was granted a permit to import pollen from Chile, valid for 12 months. Mr Hartley was the authorising officer. The exporter name was stated as “Chile” and the descriptive name was “kiwifruit pollen” rather than “frozen kiwifruit pollen”. All other details and conditions were the same as listed in the earlier permit from April 2007. This permit was not used.

b) Permit wording change

[658] On 3 November 2008 Kiwi Pollen applied for and was granted a renewal of the permit to import pollen from Chile, valid for 12 months. The issuing officer was Ms Hains. She does not specifically recall this. As the senior advisor in Nursery Stock at the time she signed the occasional permit for pollen. She would not have drafted the permit or the special conditions. She could not remember who would have because there was a lot of staff movement around this time. It could have been Ms Dickson, Mr Baring or Vivian Campbell (referred to below).

[659] This permit had the same second special condition as the previous Kiwi Pollen imports but varied the first special condition so that it said:

- 1 Unopened male flower buds must be hand collected. The pollen may be milled prior to import.

[660] Ms Hains did not remember the source of this wording. However she would not have drafted the wording change because a permit for pollen was not normally in

her area. Her permits were all for budwood arriving from offshore facilities that contained many conditions, declarations, testing and quarantine requirements. There was always a lot of work at MAF. Her team were understaffed and overworked. She considered that she was very thorough in her work and she took a precautionary approach to risk.³⁹¹

[661] At this time Mr Baring had left MAF and Ms Campbell (née Dalley) had taken over his role.³⁹² She is the person therefore most likely to have been involved in the permit. Ms Campbell agreed that pollen was not Ms Hains' area of focus and she was not usually the person who signed off pollen permits.³⁹³ She thought she may have been involved in this permit possibly with a technical officer (Ms Ormand).³⁹⁴ She could not recall doing so and nor could she recall how the change in wording came about. Her guess, from looking at it, was that the emphasis was on the "unopened male flower buds" part because Ms Hamlyn had earlier asked about importing vacuum-extracted flower buds. If this changed the meaning of the condition, to allow milling to take place in New Zealand, then this was not the intention. However the permit was still for "pollen" and it was based on information from Ms Hamlyn that she was importing pure pollen. She was not aware that pollen could contain plant products following milling. Importers were expected to comply with what they have told MAF they are going to import and, if there were visible plant parts she thought that would be picked up when inspected at the border.

[662] She did not ask anyone about the milling process or whether it would contain other plant parts. She did not recall asking Dr Clover about this or what the assumptions in the PHEL Review were. She had a high level knowledge of the risk assessment procedures which Dr Ormsby had been responsible for but did not think

³⁹¹ She had worked with Dr Clover in both Auckland and Wellington and confirmed that he continued to be used as a source of information when he left Wellington and went to PHEL.

³⁹² Ms Campbell held a BSc (Chemistry) obtained in 2004. She commenced work with MAF in 2006, first as a technical support officer in the Plant Imports team and then, from January 2008, as an advisor for Nursery Stock.

³⁹³ Ms Hains was involved in Nursery Stock but her main role at this time was more to do with accreditation of off-shore facilities, diagnostic and PEQ facilities.

³⁹⁴ Unlike the permits before and after this one, there were no initials indicating the advisor who had peer reviewed the permit ready for sign off by the authorising officer. Ms Campbell thought the peer reviewer had only started initialling the permits in the beginning of 2009. This is not correct as Mr Hartley had done so in 2007. So this appears to have been a practice which was in place, which fell into disuse for a period, and was re-instigated at some point.

she had ever seen the detail of it. She had inherited the pollen imports role. The approach to this was already in place when she did so. Generally, they tended to go with what had been done before until they became aware of an issue. If nothing had changed there would be no need to investigate anything further.

[663] She would not have checked whether there had been a risk assessment carried out because she would have assumed this had occurred before issuing the prior permits. She considered that such a risk assessment would include understanding what you were dealing with and checking whether other plant parts would introduce additional risks and whether there were other contamination risks. At the time she did not think about how the closed flower buds would protect against bacteria such as Psa.³⁹⁵ She also expected that pollen would be inspected at the border to check for pests and she thought everyone in the Nursery Stock team would have had the same expectation.

c) *The permit pursuant to which the June 2009 anthers consignment arrived*

[664] The permit pursuant to which the anthers from China came to New Zealand (arriving on 24 June 2009 and cleared on 30 June 2009) was issued to Kiwi Pollen on 30 April 2009 (application was 29 April 2009). The permit was as follows:

³⁹⁵ She did not have a biology degree but her role was more concerned with systems than biology. There was a lot of expertise in the team and she knew her limitations. At some stage she understood that closed flowers would protect against Psa in the pollen but she did not know how she came to that understanding. This is consistent with her internal email to Tim Knox dated 17 November 2010 when questions were being asked about what process had been followed for allowing pollen imports. She said contamination during milling was not addressed. However she assumed that during assessment it was considered that a primary source for contamination would be unopened flower buds.

VO

PERMIT TO IMPORT NURSERY STOCK

This permit is issued under The Biosecurity Act 1993. Any queries, please contact Plant Import & Export Group, MAP Biosecurity, New Zealand's 177th St, Wellington, (Phone 34 884 882, Facsimile 34 994 962)

Authorising Officer: *Bryan Rose* 30 Apr 2009

for Director General, Ministry of Agriculture & Forestry, Biosecurity New Zealand, acting under delegated authority.

NOTE: Total number of pages for this permit is 2.
Please ensure all pages (front pages, any appendices and attachments) are included with copies.

Permit for: Kiwi Pollen NZ Ltd PO Box 761 Te Puke 3153 New Zealand Attention: Jill Hamlyn Phone: 07 573 5100 Fax: 07 573 5101	Permit No: 2009036858 Replaces Permit No: 2008035594 Expiry Date: 30 Apr 2010 No of Consignments: Multiple Import Purpose: Propagation
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Establishment No:

Exporter Name: Bexley Incorporated	Country of Origin: China
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Descriptive Name: Frozen kiwifruit pollen	Quantity: Unlimited
Type of Material: Pollen	Measure: Units
Genus: Actinidia	Species: deliciosa
	Cultivar:

Standard
155.02.06, Importation of Nursery Stock

Special Conditions:

- Unopened male flower buds must be hand collected. The pollen may be milled prior to import.
- All consignments must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation of the exporting country with the following Additional Declaration:
"The male flower buds were hand collected and unopened."

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Ministry of Agriculture and Forestry
Te Hāora Matua, Ngāherehere

KIWI.200.004.01065

IMPORTANT INFORMATION FOR PERMIT HOLDERS AND AGENTS

- This permit, and compliance with the provisions of the specific import health standard(s) and/or entry conditions, does not guarantee that the goods you import will be given a biosecurity clearance. There are other restrictions in the Biosecurity Act 1993 which apply to the giving of biosecurity clearance.
- You need to ensure that the goods you import comply with the provisions of the specific import health standard(s) and/or entry conditions. The import health standard may be amended during the course of your permit. Import Management will notify you of any significant changes to the import health standard and will re-issue the permit to accommodate these changes.
- There are a number of other provisions in the Biosecurity Act 1993 which may affect you. If you commit an offence against the Biosecurity Act 1993, heavy penalties under section 157 of the Act might apply.
- Apart from the Biosecurity Act 1993, there are other laws relating to or prohibiting the importation of goods. This permit, and compliance with the provisions of the specific import health standard(s) and/or entry conditions, does not absolve you of the need to comply with these laws.
- Unless specifically identified in 'Description of Items' or 'Special Conditions' of the permit, NO new organisms, including genetically modified organisms, are permitted under this permit.
- All cultures must be:
 - clearly labelled with the scientific strain and name
 - consigned in leakproof packaging
 - free from contaminants

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[665] It can be seen that the issuing officer was Bryan Rose and Ms Campbell had initialled it, indicating she had peer reviewed the permit. It contained the same conditions as the 3 November 2008 Chilean permit, including the new wording for Special Condition one. This was emailed to Ms Hamlyn on 1 May 2009.

d) Further permits

[666] Further permits were issued to Kiwi Pollen on 9 October 2009 (for Chile) and 9 June 2010 (for China).³⁹⁶ The Special Conditions remained the same as for the 3 November 2008 and 30 April 2009 permits. Both permits were used: 99 kg of Chilean pollen arrived on 28 November 2009 and 21 kg of Chilean pollen arrived on 30 April 2010; and the Chinese shipment (of 11 kg) arrived at the border on 6 June 2010. It was delayed at the border as the permit had expired.

³⁹⁶ Bryan Rose is the issuing officer for these permits. Ms Campbell is the peer reviewer for the Chinese permit but not for the Chilean one.

[667] As discussed in “Part 2: Factual and regulatory background”, an outbreak of Psa in Italy had occurred. This resulted in the European Plant Protection Organisation (EPPO) issuing an alert. EPPO monitors emerging pests. An alert is intended to let countries know early on about pests that may present a risk to them, so that they can consider whether to put in place (for example) import inspections or surveillance programmes in their territory. It is not a recommendation of phytosanitary action. Rather, it is a way of telling member countries to watch out, and EPPO will have a closer look into it. MAF received EPPO’s Psa alert in December 2009. The alert was as follows:

Where Although *P. syringae* pv. *actinidiae* was originally described in Japan, its area of origin has not been ascertained. For example, comparison studies between Korean and Japanese strains showed that they have different phylogenetic origins.

EPPO region: Italy (Emilia-Romagna, Lazio, Veneto).

Asia: China (Anhui), Japan (Hokkaido (on *Actinidia arguta*), Honshu, Kyushu, Shikoku), Korea Republic.

Data is lacking on the situation of *P. syringae* pv. *actinidiae* in China (where *Actinidia* species originate from); only a small number of records were reported from the province of Anhui. In the literature, several papers mention the presence of *P. syringae* pv. *actinidiae* in Iran, but the original publication only refers to *P. syringae* pv. *syringae*.

On which plants *Actinidia* species: *A. deliciosa*, *A. chinensis*, *A. arguta*, and *A. kolomikta* (there is no data on the susceptibility of other *Actinidia* species). Observations made in Italy suggested that damage is more severe on yellow fleshed kiwifruit (i.e. *A. chinensis* cvs. ‘Hort 16A’ and ‘Jin Tao’) than on the more widely grown green fleshed cultivar (i.e. *A. deliciosa* cv. ‘Hayward’).

Damage *P. syringae* pv. *actinidiae* causes brown discolouration of buds, dark brown spots surrounded by yellow haloes on leaves, cankers with reddish exudates on twigs and trunks, fruit collapse, wilting and eventually plant mortality. The most conspicuous symptom is the red-rusty exudation which covers bark tissues on trunks and twigs. Removal of the bark usually reveals a brown discoloration of the external vascular tissues and reddening of the tissues beneath lenticels.

Transmission Data is lacking on the epidemiology of the disease. It has been observed that the pathogen is active between 10 to

20 °C and is limited by temperatures above 25 °C. Inoculation studies showed that the bacterium can infect the plant through natural apertures (stomata, lenticels) and wounds. Symptoms are usually expressed during spring and autumn when climatic conditions are favourable to the disease (cool temperatures, persistent rains, high humidity). It is suspected that the bacterium is spread by heavy rainfalls, strong winds, animals and humans. Over long distances, trade of infected planting material can spread the disease.

Pathway	Plants for planting of <i>Actinidia</i> spp. (infected fruits cannot be totally excluded but seem very unlikely).
Possible risks	Kiwifruits (<i>A. deliciosa</i> and <i>A. sinensis</i>) are economically important crops which are grown in several EPPO countries (by order of importance in production: Italy, Greece, France, Portugal and Spain). In Japan and Korea, bacterial canker has become one of the most serious limiting factors for cultivating kiwifruit. In Italy, it is estimated that the economic losses (including impact on trade) due to <i>P.syringae</i> pv. <i>actinidiae</i> have reached 2 million euros. Control strategies are being developed against the disease and include preventive measures (e.g. good fertilization, avoidance of overhead irrigation, disinfection of pruning equipment, pruning and destruction of diseased parts), regular inspections of the orchards for disease symptoms, and the use of healthy planting material. Chemical control has been implemented in Japan (e.g. with copper compounds and antibiotics), but this has led to the appearance of resistant strains. It seems desirable to better understand the biology of <i>P. syringae</i> pv. <i>actinidiae</i> in order to develop adequate control strategies in areas where it occurs, and to avoid its further spread in Europe.

[668] Dr Ormsby received this alert.³⁹⁷ This was the first he knew of the Italian outbreak. The alert noted that nursery stock may spread Psa whereas infected fruit was unlikely to spread Psa but could not be excluded. He knew MAF needed to be cautious with Psa because it was a pest of an economically important crop. On about 18 December 2009 he carried out a mini-risk analysis/hazard identification. He looked at pathways of entry. That is, how it could get into New Zealand and the likelihood of Psa transmission. The EPPO report is undertaken by people in Europe doing a similar job to him. He considered EPPO reports to be reasonably thorough and he placed some weight on them. If he was doing a risk assessment he would have looked more broadly, but this was not what he was doing.

³⁹⁷ Dr Ormsby received it on his return from leave, reviewed it and saved it to his computer on 18 December 2009.

[669] He looked at QuanCargo to see what was being imported.³⁹⁸ He saw nursery stock, tissue culture and fruit. He did not find pollen.³⁹⁹ The IHS required a phytosanitary certificate and for the nursery stock to go into PEQ for a minimum of six months. He concluded that this Psa pathway risk had already been considered and there were measures to address the risk.

[670] Dr Ormsby discussed this with Dr Sathyapala. Their conversation was about whether anything needed to be done urgently in response to the EPPO alert and his recommendation was that it did not. Although he did not recall the details, he considered he would have mentioned nursery stock and fruit, but not pollen as he was not aware of any pollen imports at this time. He recalled being surprised when he later saw MAF's Pathways Tracing Report (discussed later in "Part 6: Causation") after the Psa incursion in New Zealand and talking to people about it.

[671] In February 2010 an EPPO panel recommended that further information should be gathered and that Psa should be maintained on its Alert List.

[672] In February 2010 Dr Sathyapala had moved from RAG to become the manager of Fresh Produce in the Plant Imports team. By this time MAF was looking at what steps needed to be taken arising out of the Psa problem in Italy. There was, for example, concern from Plant & Food that Italian gold kiwifruit was arriving in New Zealand when this was not permitted under the IHS, and that "white peach scale" had been found on the fruit. Dr Butcher made some enquiries with the Italian NPPO about this. Dr Sathyapala also tasked Dr Jo Berry to look into this.

[673] On 7 April 2010 Seeka issued a press release advising that Psa had impacted its 84 hectare Hort16A kiwifruit orchard in Italy, impacting on its Italian investment. Following this, on 18 April 2010 Mr Atkinson, a journalist, emailed MAF about Psa

³⁹⁸ MAF/MPI's electronic database suite is called Quantum and it integrates the systems known as QuanCargo, Quanmail and Quanax. These record information relating to the management of biosecurity risks associated with cargo, mail and passengers coming into New Zealand respectively.

³⁹⁹ QuanCargo uses drop down menus. There are different classes that can be searched. The pollen drop down menu was separate to nursery stock. He would have used the nursery stock drop down menu. He was not aware that kiwi fruit pollen was being commercially imported. He may have also looked at what was being imported by country or by looking at *Actinidia*. He considered the QuanCargo database to be a "minefield" and he could spend a long time wandering the data to try and clean it up.

in Italy, asking what MAF was doing to evaluate the potential risk to New Zealand kiwifruit in light of the incursion in the Northern Hemisphere. His request was forwarded to, amongst others, Dr Sathyapala. In an internal email she noted that the issue was being discussed that day with the Plant Exports team. Her email also noted that a risk assessment was needed, that she thought Dr Berry had conducted one for the species and not the strain, and that, as New Zealand was importing kiwifruit, fruit might need to be the focus for considering the transmission of this disease. Dr Newfield said that her team could probably add to the response to the media inquiry. She duly provided her comments on the proposed response. There was no reference to pollen in this response which focussed on fruit and nursery stock.

[674] Between 9 and 12 April 2010 Dr Berry conducted a pest risk analysis on Psa. She reported under “Fruit Transmission” that the pathogen may exist as a resident on the surface of mature fruit, but it was improbable that cells would survive to infect seed or seedlings. It is apparent that she relied on the EPPO alert in preparing her pest risk analysis. She referred to the EPPO 2009 alert that “infected fruits cannot be totally excluded but seem very unlikely”. Under “Pathways” she referred to the trade of infected plant material and orchard equipment such as pruning implements (because Psa was a wound-infecting pathogen). Seed was considered unlikely. Under “Distribution” she referred to Japan, South Korea, Italy and China.

[675] Dr Kerry Everett, a senior scientist at Plant & Food, was aware of the Psa outbreak in Italy through her colleague Mike Manning (who had visited Italy with Dr Vanneste in 2009). She was concerned to ensure that MAF was aware of the risk for New Zealand. She had a conversation with Dr Berry, as referred to in an email from Dr Berry on 16 March 2010. An exchange of emails took place between them on 16 and 17 March 2010.⁴⁰⁰ In this exchange:

- (a) Dr Everett was asking about the species imported and said she was “just concerned to make sure the industry is protected”.

⁴⁰⁰ Part 9 of this concerned whether MAF was allowing other species of kiwifruit to be imported.

- (b) Dr Berry's reply referred to the Nursery Stock IHS allowing importation of *Actinidia* and noted that the imports are tested for bacterial canker.
- (c) Dr Everett said all species were susceptible to kiwifruit canker and it was not "no risk" for fruit imports from Italy.

[676] Dr Everett said she was frustrated about what was happening and so, after a press report about the Italian outbreak, she contacted MAF again in May 2010. She emailed the generic Plant Imports email address as she thought it might provide another opportunity to get her message through to MAF. Her email attached the press report and said "Do you think the import risk assessment should be re-examined".

[677] On 25 June 2010 Dr Everett received a letter from Dr Sathyapala. This letter said that MAF had recently investigated the presence of Psa in Italy and the potential risk of exposure by importing *Actinidia deliciosa* fresh fruit for human consumption. The letter went on to say:

EPPO (2009) considers the movement of infected planting material to be the main pathway for the spread of this bacterium and although spread via infected fruits cannot be totally excluded as a possibility, it appears to be very unlikely. Additionally, according to CPCI (2010), although the pathogen may exist on the surface of mature fruit, it is improbable that cells would survive to infect seed or seedlings.

In order to impose additional phytosanitary measures for the importation of *Actinidia deliciosa* (Green Kiwifruit) fresh fruit for human consumption from Italy, MAFBNZ would require published evidence of transmission of *Pseudomonas syringae* pv. *Actinidiae* via whole undamaged kiwifruit. Due to the lack of evidence in current literature on transmission via whole fruit, MAFBNZ will not be imposing further measures at this point. An additional review is an option if further literature becomes available.

[678] Dr Everett was not satisfied with this response. She was concerned that there may have been a lull between the publication the MAF response referred to and what was now known about the aggressiveness of the Italian incursion. She immediately went to her boss at Plant & Food.

[679] In July 2010 Dr Sathyapala was contacted by Dr Tanner from Zespri. He asked for a meeting to discuss measures on fruit imports from Italy. The meeting took place

on 23 July 2010. Dr Sathyapala described it as a tense meeting because Zespri wanted MAF to impose measures and Dr Sathyapala considered published technical evidence to do so was required.

[680] Plant & Food contacted Dr Butcher on 17 August 2010 to inform him of Dr Vanneste's research into Psa on fruit. On 20 August 2010 the chief executive of Plant & Food also wrote to the Director-General of MAF advising of this research. This letter said the research had been commissioned because Dr Sathyapala had said "published evidence of the ability of Psa to be transmitted by whole undamaged kiwifruit" would be necessary before considering any additional phytosanitary measures. The research was commissioned due to concern about the possible introduction of Psa into New Zealand via imports of green kiwifruit from Italy and the potential impact on New Zealand's kiwifruit industry.

[681] On 29 September 2010 Dr Vanneste emailed Zespri informing them, among other things, that pollen from infected orchards did carry live cells of Psa and therefore infected pollen should not be imported into New Zealand for pollination purposes.

[682] Dr Vanneste's preliminary report was reviewed by MAF personnel. On 7 October 2010 Zespri requested that MAF close the border to Italian imports of fresh kiwifruit. This was a request to impose provisional measures. MAF provided a briefing to the Minister on 11 October 2010 about this. At a MAF meeting on 18 October 2010 the view was that Dr Vanneste's report did not provide enough information to impose provisional measures on Italian fruit imports. However, at a workshop meeting on 22 October 2010 involving MAF, Plant & Food, Zespri and importers, the importers agreed to place voluntary constraints on imports.

[683] Unrelated to these developments, on 13 July 2010 Ms Campbell emailed Dr Newfield asking for someone in RAG to search for plant pathogens associated with *Hemerocallis* (a type of flower), as plant imports had received an enquiry about importing *Hemerocallis fulva* pollen from the USA. She followed up this request on 1 September 2010. Dr Newfield responded, having carried out a "quick look", on 3 September 2010. She discussed some viruses and said:

I haven't got to the bottom of whether we need to be concerned about anything other than viruses on pollen. There does seem to be some evidence that some bacteria and fungi can be pollen transmitted. But I haven't managed to answer which ones and under what circumstances.

...

There may be some value in a wider project on "what types of organisms should we worry about on different pathways?" eg are bacteria and fungi a concern on pollen, what about phytoplasmas on tissue culture? A piece of work like that may give us more confidence when we are dealing with this kind of query.

[684] Ms Campbell replied on the same day agreeing some further work on pollen was required because "[t]o date all import requirements are based on virus transmission". She was asked in cross examination whether she was surprised to learn of potential bacteria and fungi issues with pollen. She did not think she was surprised as this was a new type of pollen being considered. It was also not unusual for new information to arise and for MAF to respond when it did arise.

[685] Ms Campbell was one of the MAF personnel who learned of Dr Vanneste's findings in his preliminary report. In response to them she emailed Mr Rose on 11 October 2010 setting out the current imports potentially affected by this. She referred to two nursery stock consignments from Italy which were presently in PEQ. She also referred to pollen as follows:

Nursery stock – imported pollen

There is only one importer – Kiwi Pollen NZ Ltd. The import requirements are based on the [PHEL Review].

Currently imported pollen is given biosecurity clearance on arrival in New Zealand, as there are no recorded pests or pathogens that are pollen transmitted in Actinidia species. Kiwi Pollen are currently only importing frozen, hand collected male flowers, which may be milled prior to export.

Initial information from Plant & Food suggests that [Psa] may be pollen transmitted. If this is the case we may need to review the import requirements for Actinidia pollen.

[686] Ms Campbell agreed in cross examination that Dr Vanneste's findings indicated that it was unsafe to rely on the findings of the PHEL Review. However the immediate priority was the nursery stock that was currently held in PEQ, one of which was due for clearance.

[687] On 1 November 2010 Ms Hains sent an internal email to Ms Campbell, Mr Rose and Kathryn Huir (another MAF employee) having done a quick scan on the internet about Psa. She said she thought some urgent amendments to the IHS should be made because if Psa got to New Zealand it would significantly impact the kiwifruit industry. She thought MAF should take a precautionous approach and consider whether budwood from Italy or other countries with Psa should be permitted at all.⁴⁰¹ Mr Rose advised Ms Hains to funnel any actions through Dr Sathyapala as she had already developed a working group on Psa.

[688] MAF was notified that an orchard had Psa symptoms on 5 November 2010. About a week after the outbreak, Ms Newfield, the team manager of RAG, coordinated a literature review on the bacterial transmission of pollen. This is discussed in more detail below. The work was undertaken by Catherine Duthie in RAG and Ms Campbell from Plant Imports was also involved. The review was ready by 10 December 2010. It was described as being a “summary of the existing information relating to the transmission of plant pathogenic bacteria via pollen”. It said it was a review “to assess the evidence for pollen transmission of plant pathogenic bacteria and the consequent risk of the spread of [Psa] between kiwifruit orchards”. It said:

...

- The literature search for this report found several studies reporting bacteria associated with pollen. Two authors present evidence of pollen dissemination of the bacteria causing walnut blight and fire blight and Phatak (1980) cautions that there is a real danger of pollen contamination and transmission. Several other studies found plant pathogenic bacteria associated with pollen, but no evidence of transmission.
- Given that bacteria can be associated with pollen and subsequently transmitted to uninfected plants, and PSA is able to infect new growth when sprayed in an aqueous solution, there exists a risk of the spread of PSA by artificial pollination.
- Additionally there exists a risk of the spread of PSA independent of the pollination system if infected plants are present in windy environments with high relative humidity.

...

⁴⁰¹ She was thinking of budwood because this was her area.

[689] The literature review referred to three articles where the authors either did not find, or did not look for, transmission of bacteria. It then referred to evidence that plant pathogenic bacteria are associated with pollen and transmitted by pollen either in a natural pollination system or artificial research environment. Here the literature review referred to Ark (1944a) and (1944b), Phatak (1980) and Sabatini *et al* (2006). The literature review discussed these papers and said “[i]n conclusion there clearly exists a risk of transmission of plant pathogenic bacteria by the mechanism of pollen transfer and this risk warrants further investigation”.

[690] Dr Card was referred to this literature reviewed in his evidence in chief. His evidence was that he was likely to have found these references because his search terms would have included pollen bacteria. He said that if he had found them, he would have excluded them because “they are all suggestive, none of them actually are a confirmed experimental data to show that any of those pathogens were actually pollen transmitted”. He said that if he had been asked to consider the risk of pathogens being transmitted by contaminants of pollen, he would accept there would be some risk. He considered the risk arose if there was “not the correct sort of cleaning of” the impurity so that the pathogen could pass along the chain. He said in response to the following question:

- Q. Would you agree or disagree that at the time when you did your literature review, there were no bacteria associated with the pollen?
- A. So there certainly are bacteria that are associated with pollen and I would have known that at the time, yeah, but they wouldn't have used pollen as a specific mechanism to transmit and I think even in one of those prior drafts of the paper you provided me just now, there was a couple of bacteria that were mentioned in there as contaminating or associated.

The PHEL Review

The respective submissions

[691] The plaintiffs submit the authors of the PHEL Review, in particular Dr Clover, were negligent in concluding there was no pollen transmitted bacteria. More particularly, the negligence involved:

- (a) A fundamental misunderstanding between the authors about the scope of the PHEL Review and what was within and without its scope.
- (b) Relying on the Nemeth paper which did not support the PHEL Review's conclusion that there was no known pollen transmitted bacteria.
- (c) The absence of any other evidential basis for the PHEL Review's conclusion that there was no known pollen transmitted bacteria.
- (d) The fact that the available scientific evidence demonstrated that bacteria could be associated with and transmitted by pollen.
- (e) There being no basis for Dr Clover's assumption that pollen imported for breeding purposes would always be "pure" and uncontaminated by other plant parts, and the authors failed to identify that assumption adequately.

[692] The defendants submit the authors of the PHEL Review were not negligent because:

- (a) The PHEL Review was a significant review of the scientific literature, which underwent peer review by a number of internal and external scientists, and contained a clear conclusion that there are no pests or diseases associated with, or transmitted by, kiwifruit pollen.
- (b) The PHEL Review considered the pests and diseases associated with and transmitted by pure pollen. The report did not cover casual contaminants, as it would be impossible to do a literature review on contamination.
- (c) The conclusion on bacteria was accurate based on scientific knowledge at the time (from the totality of papers considered). The papers raised by the plaintiffs to discredit the conclusion were merely suggestive of association or contamination, and did not prove transmission. It was a reasonable judgement call not to cite or rely on them.

- (d) The *Actinidia* section was accurate based on the scientific knowledge (from the literature reviewed) at the time. The association of Psa with vacuum-collected pollen was unknown to science until four years later (Vanneste, May 2010). The association of Psa with pollen from hand-picked unopened flowers was unknown to science until December 2011 (Taylor, December 2011). Transmission by pollen was unknown until 2011 (Stefani *et al.*) or 2014 (Tontou *et al.*).

Misunderstanding between Dr Card and Dr Clover?

[693] The evidence discussed above shows that the PHEL Review was taking place against the background of: concerns by some importers as to the time and cost involved in pollen imports; a recent change within the Plant Imports team to start treating pollen imports similarly to seed imports; an update to the *Actinidia* schedule to the nursery which had not included pollen; and an update to the manual for testing *Actinidia* nursery stock for Psa. Although *Actinidia* was one of the pollen imports MAF had in mind, the PHEL Review was to cover all pollen.

[694] The evidence discussed establishes that, at its inception, the purpose of the PHEL Review was to assist with specific testing of seeds for pollen-borne diseases, after pollen had been imported into a transitional facility and had fertilised a mother plant. This was what Dr Clover said to Dr Herrera on 24 August 2006 when briefing her for the meeting with Dr Sathyapala and Ms Cooper on 29 August 2006. It was also confirmed by Dr Herrera after the meeting. Stakeholders were advised on 22 September 2006 that the Review was to clarify the pests of concern with further work planned for investigating methods to directly test for those pests.

[695] It is apparent that Dr Clover was looking to reduce any unnecessary barriers to pollen imports, recognising that pollen was a source of germplasm for breeding purposes. He had been directly involved in pollen import requests, and it was his proposal that Plant Imports approve two pollen import requests in July 2006 by treating them in the same way as seed imports (around six months after Brian Double had suggested this as a potential approach).

[696] It is also apparent that Dr Clover had in mind pollen imports being used for breeding purposes rather than commercial imports for artificial pollination of crops in the field. If the pollen was for a species for which the seed would have to go to PEQ, then so too would the pollen, and the resulting seed to be used for breeding would be specifically tested for pollen-borne diseases. This is consistent with the MAF document circulated on 28 August 2006 that *Actinidia* was an important horticultural crop. It was essential that breeding was facilitated through the import of new genetic material and importing pollen was one available method. It is also consistent with the 22 September 2006 stakeholder update which referred to pollen being a source of germplasm for breeding purposes.

[697] It is apparent at least some of this background was accurately communicated to Dr Card when he was engaged to carry out the review. Dr Card's evidence was that he understood the review was because industry groups were interested in using pollen as germplasm for breeding new species. This focus is indicated in the PHEL Review as finalised on 22 November 2006, the first sentence of which was "Pollen is a valuable source of germplasm for breeding and from a biosecurity perspective has relatively few pests and diseases associated with it compared to other types of genetic resource".

[698] I consider, however, that Dr Card and Dr Clover did not have the same understanding of the degree of association between pests and pollen which was to be covered by the PHEL Review. Dr Card's understanding of "transmission" was a pest which had evolved or developed a way of passing on from mother plant to daughter plant. He was not covering contaminants (impurities) or hitch hikers and this therefore excluded bacteria that might be travelling with the pollen, unless the bacteria would enter the plant during pollination and take advantage of the plant's reproductive cycle.

[699] Dr Clover, however, intended Dr Card to also cover pests intimately associated with pollen. By this he meant where a pest in an infected plant would be associated repeatedly with the pollen from that plant because the pest has adhered to the pollen or been inside it. He did not mean a casual contaminant that was almost accidentally associated with the pollen. Dr Clover's intended wider scope of the paper is consistent with his response to Ms Dickson about Kiwi Pollen's first request to import pollen.

That response said there were no pests or diseases known to be “associated” with pollen of *Actinidia*.

[700] Dr Card’s more narrow approach to the paper’s scope is understandable in the context of using pollen for germplasm for breeding in PEQ and testing of the resulting seed specifically for pollen-borne diseases. It seems that Dr Pearson had the same view of the paper’s scope – he had suggested deleting part of the discussion under the “bacteria, mollicutes and fungi” section of the paper because it did not relate to disease causing organisms.⁴⁰²

[701] But neither this particular context, nor that it covered only a technical meaning of transmission was obvious to readers of the paper. I say this for a number of reasons. First, the paper states its purpose as being to “assist the risk analysis process by identifying the pests and diseases that are transmitted by pollen”,⁴⁰³ but it does not clearly state it is confined in its scope to pests and diseases that are transmitted to the seed when pollen is used for breeding purpose.⁴⁰⁴

[702] Secondly, the paper refers to “association” in a number of places, suggesting it has covered this as well as “transmission”. For example:

- (a) The Executive Summary refers to “a limited number of reports on the association of fungi with pollen ... and there are no known bacteria, mollicutes or invertebrates that use pollen as a form of transmission”. It is unclear whether this means there are no known bacteria that are associated with pollen.
- (b) The Executive Summary also says “[t]hirty four viruses and five viroids have been identified as being pollen transmitted or associated with pollen ...” and “[o]f these, no viroids and only eight viruses are associated with those plant genera that are most likely to be imported

⁴⁰² There was no direct evidence of Dr Pearson’s view. Dr Everett’s evidence of a conversation she had with him is hearsay evidence. I have therefore not taken it into account. It does not in any event assist because it is the fact of the misunderstanding as between Dr Clover and Dr Card that is relevant.

⁴⁰³ See Executive Summary and last paragraph of the Introduction.

⁴⁰⁴ I accept the discussion on viruses and viroids is focussed on transmission.

as pollen into New Zealand”. This suggests the paper does cover organisms associated with pollen.

(c) The Introduction stated:

In considering whether a pest or disease is transmitted by pollen the following criteria were considered during the review:

- association with pollen; and
- transmission via pollen to the mother plant during pollination and/or seed following fertilisation; and
- whether observations had been made *in vivo* or from experimental studies; and
- the existence of contradictory reports; and
- the quality of the evidence presented.

This indicates the paper has covered organisms associated with pollen.

(d) The section on Bacteria, Mollicutes and fungi referred to transmission, association and contamination.

[703] Thirdly, the MAF peer reviewers were unclear about the paper’s scope:

- (a) Dr Fernando regarded the paper’s objective was unclear. He queried if the PHEL Review was a pest analysis, suggested the introduction would be better to state the paper’s overall and specific objectives, queried the heading “Pest Risk Analysis”, asked if it was a “review” and queried its scope.
- (b) Dr Ormsby’s suggested amendments to the “Pest Risk Analysis” section to clarify the “aim of the review”, said seed transmission of viruses “through the pollen” needed to be clearer, and noted that the literature referred to under “Bacteria, Mollicutes and Fungi” showed that pollen can be contaminated by fungi and bacteria.

[704] Fourthly, the terms “contamination”, “association” and “transmission” are not tightly defined terms and may depend on their context. Dr Newcomb, a distinguished scientific expert called by the defendant, said:

Scientists do not typically use science dictionaries as such, but I consider the following from the Oxford English Dictionary and related dictionaries to be perfectly acceptable.

[705] The definitions he provided⁴⁰⁵ are broadly consistent with how others in MAF, such as Michele Dickson, Wayne Hartley, Tamsin Hains and Dr Herrera, defined them when asked to do so in evidence. Mr Hartley also said “contaminated” and “associated” can be used interchangeably. Dr Ormsby, when asked what he understood the words to mean, said:

A. ... terms and definitions, I get fed up with the whole thing. Everyone interprets whatever they want into whatever they want ... I mean they're just words ... I would go back to the source.

Q. ... the primary data would include a description of what mechanisms of transfer were being looked at in a paper expressly, correct?

A. Certainly, yes.

[706] Dr Beckett, an expert called by the plaintiffs, considered “association” did not have a definition that was “absolutely cut and dried” and it was not something “you could always say would mean a particular thing in a particular situation”. In the context in which Dr Clover used “associated” in an import risk analysis context, when replying to Ms Dickson, Dr Beckett considered Dr Clover meant there were “no pests or diseases known to either be present in or on or with this particular commodity, which is kiwifruit pollen”. This was similar to Dr Clover’s “intimately associated” compared with “casual contaminant” distinction.

⁴⁰⁵ Dr Newcomb goes on to provide the following definitions: **Contamination** (Oxford English Dictionary): The action of contaminating, or condition of being contaminated; defilement, pollution, infection; **Is the concept of “contamination” different for bacteria and viruses?** Only in so far as these potential contaminants are capable of self propagation. Saying that viruses require a host to reproduce while bacteria do not; **Transmission** (Oxford English Dictionary): The action of transmitting or fact of being transmitted; conveyance from one person or place to another; transference; **Association** (Oxford Dictionary of Biology): An ecological unit in which two or more species occur in closer proximity to one another than would be expected on the basis of chance. Early plant ecologists recognized associations of fixed composition on the basis of the *dominant species present (eg a coniferous forest association). Associations now tend to be detected by using more objective statistical sampling methods.

[707] Dr Beckett was referred to the statement in the Card Paper that there was no pollen transmitted bacteria but there are reports of fungi associated with pollen, and said “[w]ell that’s an interesting statement ... [w]hy have they not talked about bacteria associated with pollen?” He considered it would be unsound to “assume, without being told, that they had dealt with fungi in a different way to bacteria ... you can transmit bacteria by virtue of the fact they are associated with pollen”. In response to whether it was clear that Dr Card was making a distinction between transmission and contamination he said:

I disagree. I think when you are talking about associated, you are talking really about how tightly bound or what have you, you know the particular pathogen is with the pollen. When you are talking about transmission ... the language for transmission doesn’t include the language for association ... the transmission of bacterial diseases through pollen, can include the vectoring of those diseases on pollen or with pollen, you know, that’s still transmission.

[708] Dr Everett, whose expertise was in plant pathology, was asked what she would understand “transmission by pollen” to mean in a plant pathology context. She said she would have “just taken it at face value ... that bacteria would not be present on pollen”. She was later told by Dr Pearson around “the tea table” at her work place that it meant inside the pollen grains and she thought:⁴⁰⁶

they should have made that clearer in the paper that that’s what they actually intended because it was published in a general plant pathology journal and not in a virology journal, and so the precise meaning that was intended would not have been obvious to a general plant pathologist and most people would have interpreted it the same as I did, which was that pollen was not able to be even associated with bacteria.

[709] It was important to be clear about the paper’s scope if it was to be used as an input into the risk analysis and measures for pollen imports. As Dr Beckett said the paper stated its purpose was to support import risk analysis. When setting out when a pest risk assessment of a specific pathway might be required, ISPM11 states:⁴⁰⁷

A list of pests is likely to be associated by the pathway (eg carried by the commodity) ... [i]f no potential quarantine pests are identified as likely to follow the pathway, the PRA may stop at this point.

⁴⁰⁶ There was an objection on the basis that Dr Pearson’s statement was hearsay. What is relevant, however, is Dr Everett’s views about whether this was clear in the paper. The evidence was admitted on this basis.

⁴⁰⁷ The International Plant Protection Convention (IPPC) issues International Standards for Phytosanitary Measures (ISPMs).

[710] Similarly, Dr Ormsby's evidence about this was:

- Q. Just then before we even get publication if one is distributing a paper to people with less expertise, non-virologists and non-pathologists, it would be prudent, wouldn't it, to be clear about any restrictions on the application of the paper to circumstances other than those in the minds of the writer?
- A. Okay, so I'll turn that question around. When giving risk advice I'm very careful to provide the context to that risk advice. So if it's on a particular pathway, and this is something we spend a lot of time making sure we're very clear on, then we specify that very carefully. So the exclusions are this, you know, this applies to this pathway but not, so mode of transmission, we'd be very clear about what mode of transmission we're providing our risk advice in relation to.

[711] It is apparent from the content of the PHEL Review that Dr Card understood it would be used to assist with risk analysis for pollen imports. However, as he said in his evidence, he did not know how MAF was intending to use the report. By that I take him to mean he did not know MAF's processes for assessing imports, and therefore how the PHEL Review would be used in those processes. He was on a fixed term contract to carry out the work and did not have a MAF background in imports.

[712] Dr Clover, however, did know MAF's processes. It was therefore important that he make sure Dr Card understood the scope of the paper when he was carrying out the literature review. This lack of clarity meant that Dr Card had excluded literature referring to bacteria contaminating pollen, although aware of this risk, because "they are all suggestive, none of them actually are a confirmed experimental data to show that any of those pathogens were actually pollen transmitted". Dr Clover was not aware of this. This must mean that he had not checked with Dr Card the basis on which he had excluded potentially relevant literature on bacteria associated with pollen. Dr Clover said he understood the authors had "a common understanding" of the scope of the paper "and that was clear to me throughout the conversations that I had and the drafts that we considered jointly". However that conflicts with the evidence that each gave about what they understood the report covered.

[713] Dr Card's focus on a specific form of transmission also explains why he made no changes to his paper in response to Dr Ormsby's comment that "what all this shows is that pollen can be contaminated by fungi (and bacteria) and as such can act as vector

of fungi and bacteria”. His response to the comments from Dr Ormsby and Dr Fernando did not clarify the intended scope of the paper by stating that it was not concerned with bacteria which contaminated pollen. That response therefore would not necessarily have alerted Dr Clover that potentially relevant literature on bacteria associated with pollen had been excluded and that changes were needed in light of the peer review comments from the RAG (Dr Fernando and Dr Ormsby).

[714] Dr Clover was asked if with hindsight he would change the PHEL Review/Card Paper to be clear about terminology. He said:

If you wish me to speculate, yes, you could, or one could have benefitted from having a ... discussion about what association meant and what transmission meant. I was clear what I had in mind and I understood it well, other plant pathologists had the same understanding, therefore I didn't think it was necessary. ...

[715] I conclude there was a misunderstanding between Dr Card and Dr Clover as to the scope of the PHEL Review. I consider this misunderstanding arose from a failure as between Dr Clover and Dr Card to take reasonable care in defining and clarifying the paper's scope. This failure to take reasonable care is not of a kind which is outside the Court's proper area. It is not a failure to take care in weighing competing social, economic and political considerations in formulating policy. Were this a case outside the government context, it would be professional negligence. Nor is it a difference in reasonable scientific views. It was a process error.

The reliance on Nemeth

[716] The PHEL Review as at 23 November 2006 stated: “There are no known bacteria or mollicutes that are pollen transmitted (Nemeth, 1986b)”. This was the only statement in the PHEL Review about bacteria and pollen, other than the Executive Summary which stated: “There are a limited number of reports on the association of fungi with pollen, most of which involve saprophytic species on a restricted number of plant hosts and there are no known bacteria, mollicutes or invertebrates that use pollen as a form of transmission”. The PHEL Review stated under the heading “Pathogens specific for plant genera likely to be imported as pollen”, “There are no recorded pests or pathogens that are pollen transmitted in *Actinidia* species”.

[717] This was the version of the PHEL Review which existed when Kiwi Pollen first enquired about an import permit, and was advised by Ms Dickson that a phytosanitary certificate would be required declaring the milled pollen was sourced from hand collected, unopened male flowers and had been microscopically inspected and found to be free of regulated organisms.

[718] Kiwi Pollen's first application was not formally approved until 16 April 2007. At that time the PHEL Review had been updated to include the more up to date information which had been included in the manuscript (the Card Paper) submitted for publication. However this update of the PHEL Review did not make any changes to the statement about bacteria and pollen. It continued to refer to Nemeth, and only Nemeth, in support of that statement.⁴⁰⁸ Nor was there any change in the Executive Summary about bacteria; nor to the statement regarding *Actinidia*. There is no evidence of any further changes made to the PHEL Review when Kiwi Pollen's later permit applications, including the permit under which the anthers from China entered the country, were approved.

[719] The draft Card Paper as provided to Dr Pearson on 6 February 2007 had removed the Nemeth reference and altered the statement to: "There are no pollen-transmitted bacteria or mollicutes, but there are a few reports of fungi associated with pollen, most of which are saprophytic species on a restricted number of plant hosts". The statement in the Abstract was similar: "There are no bacteria, mollicutes or invertebrates that are pollen-transmitted". This statement was repeated in a Conclusion section which had by this time been added to the draft.

[720] The reference to "mollicutes" was changed (after Dr Liefing's suggestion for a definition) by the time of the final published Card Paper in September 2007. By this time the statement read: "There are no pollen-transmitted bacteria, phytoplasmas or spiroplasmas, but there are a few reports of fungi associated with pollen, most of

⁴⁰⁸ See the PHEL Review, as emailed by Dr Clover to Chris Baring on 14 March 2007. There is no evidence of any change to this statement and its reliance on Nemeth when Dr Sathyapala gave the "sign off" on or about 13 April 2007. It is unclear whether in the end, RAG had given sign off to use the PHEL Review or the Card Paper. I have considered both and consider it is not material to the outcome whichever one it was. The Card Paper manuscript by that time no longer referred to Nemeth or any other publication in support of its more definitive statement that there were "no pollen-transmitted bacteria".

which are saprophytic species on a restricted number of plant species”. A similar change was made in the Abstract where it was said: “There are no invertebrates, bacteria, phytoplasmas or spiroplasmas that are pollen-transmitted”.⁴⁰⁹ The statement in the Conclusion was similarly changed.

[721] The title of the Nemeth publication was “*Transmission through seed and pollen. Virus, Mycoplasma and Rickettsia Diseases of Fruit Trees*”.⁴¹⁰ It was a text book published in Hungary in 1986. It only related to two specific genera of bacteria, namely mycoplasma and rickettsia. Under the heading “Transmission of fruit tree viruses, mycoplasmas and rickettsia-like organisms in nature”, the paper included the statement: “In the orchards the spread occurs by pollen, insect vectors and natural root grafting”.⁴¹¹ Later, under the heading “Transmission through seed and pollen”, it stated: “With mycoplasmas and rickettsia-like organisms no pollen transmission has yet been established”.⁴¹²

[722] Dr Clover suggested that the Nemeth reference may have been included originally because it “said definitively that a certain group of bacteria were not transmitted”. However that is not correct: it said for these particular organisms (mycoplasmas and rickettsia-like organisms) “no pollen-transmission has yet been established”. It did not support the conclusion in the paper that pollen could not transmit these particular organisms, let alone all bacteria.

[723] Dr Ormsby had not looked up the Nemeth reference when he assisted with the peer review of the PHEL Review because, as discussed above, he considered the statement about bacteria was wrong and obviously so. He read Nemeth later, post incursion, when he heard “through chatter” that the PHEL Review or Card Paper had been one of the things taken into account when the permits were issued. In cross examination he said that the reference did not support the statement because it was concerned with specific kinds of bacteria whose epidemiology was different from most

⁴⁰⁹ The Card Paper also made a similar statement as that in the PHEL Review about bacteria relying on water splash often aided by air currents or insects, usually being unable to penetrate new hosts directly, and relying on natural openings.

⁴¹⁰ M Nemeth *Transmission through seed and pollen. Virus, Mycoplasma and Rickettsia Diseases of Fruit Trees* (1986, Martinus Nijhoff Publishers, Hungary).

⁴¹¹ Nemeth (1986b) at 111.

⁴¹² At 114.

bacteria and fitted “nicely” within the group of viruses and phytoplasmas discussed in the Nemeth book:

- Q. So you’re saying not an appropriate, right. And that is because?
- A. Because it’s referring to a certain type of bacteria which are cell bound if you like, or they’re bound within the plant, not free living in the sense of what you’d call, you classically think of as bacteria.
- Q. Right so they’re two types that are associated with the plant in the most intimate possible way, they’re transmitted in it so to speak?
- A. Basically yeah the transmission is – the epidemiology is such that they’re not so freely, not transferred through the environment in a free manner that you’d find with most bacteria.
- Q. Right, so they’re transferred more in a way akin to the typical virus where body fluid transference so on is required?
- A. Yeah just basically the purpose of the book.

[724] As Dr Beckett put it:

This reference [to Nemeth] is not a peer-reviewed published research paper. It is a translated Hungarian text book that was 20 years old at the time of its citation by Card and Clover, and, as titled *Virus, Microplasma (sic) and Rickettsia Diseases of Fruit Trees*, was only concerned with a subset of bacterial plant diseases. It seemed to me to be farcical to rely on a single reference – and one as weak as this – to provide the underpinning for a statement that would, in effect, dictate New Zealand’s quarantine policy for the importation of plant pollen.

[725] I therefore agree with the plaintiffs that the Nemeth reference did not support the statement in the PHEL Review that “there are no known bacteria or mollicutes that are pollen transmitted”. At most, it supported the statement that a particular subset of bacteria (which behaves differently from most bacteria) was not known to be pollen transmitted. Nor did the Nemeth reference support the more definitive statement in the Card Paper that “there are no pollen-transmitted bacteria, phytoplasmas or spiroplasmas”.

Any other basis for the statement?

[726] Dr Clover cannot recall why the Nemeth reference was removed. He considered one plausible reason to be that it was unclear whether the Nemeth paper related only to fruit trees or whether its scope extended to a wider group of plants.

Another possibility was because the Nemeth statement did not refer to all bacteria but only rickettsia-like organism and phytoplasmas. He agreed with the evidence of others that these represented a minority of bacteria.⁴¹³ This raises the question of what then supported the statement that “there are no known bacteria or mollicutes that are pollen transmitted” (the PHEL Review) and the statement that “there are no pollen-transmitted bacteria, phytoplasmas or spiroplasmas” (the Card Paper).

[727] Dr Clover was asked whether the Nemeth paper was the only paper he had to support the statement. He did not think it was. He believed there would have been papers about particular species of bacteria and their lack of transmission, but Nemeth was the one which had broader applicability. He could no longer recall the particular papers that might have been relied on. When pressed further in cross examination he referred to the FAO Guidelines. This discussed transmission of other organisms and, because it did not record bacteria being transmitted, he suggested it was reasonable to conclude there was no evidence of bacteria transmission through pollen. He remembered the FAO Guidelines because he used them for the MAF testing manuals as well.

[728] Dr Clover further explained that:

It’s one of those difficult things to describe. It’s more of an absence of data, and obviously you can’t refer to an absence of data in a cited reference ... but there are a number of reviews of pests and diseases that we referred to in the paper and they do not refer, with the exception of Phatak, [to] bacteria at all.

[729] The defendant submits a literature review describes the state of scientific knowledge at the date of publication. At the date of publication the literature review had not provided evidence of pollen-transmitted bacteria and it is difficult to prove a negative. Dr Clover said Nemeth was the only publication in which they could find “evidence of a negative”. Along similar lines, Dr Card said the Card Paper would have been read as meaning “there was still no literature at the time that showed that any bacteria would use pollen as a specific route of transmission”. He agreed with the proposition put to him that “no scientist would read that as suggesting that [he had]

⁴¹³ Dr Clover also said that only a minority of bacteria infected plants and cause disease and it was not possible to estimate what proportion of them were mycoplasmas and rickettsia-like organism.

gone out and tested every bacteria in the world to figure out whether or not ... pollen transmission [occurred]”.

[730] However, as Dr Beckett said, Nemeth was the single reference relied on in the PHEL Review. The PHEL Review was relied on for decisions on pollen imports. It did not refer to the FAO Guidelines. Nor did it explain that the statement was made, not because literature stated there was no pollen-transmitted bacteria, but rather because the authors had looked for literature discussing pollen-transmitted bacteria and had not found any.

[731] As Dr Ormsby said:

... [at] the hazard identification stage of a risk assessment where you're looking at the potential hazards on a pathway and if I've done a full hazard review of full, you can never finish one, but if I've done one where I'm reasonably satisfied I've been comprehensive and there's no evidence of a bacterial association then I would take, I would be comfortable with that conclusion, but if I was just starting one and the first thing I looked at, the first bacteria I looked at was not associated, well, I've just started so we'd say, okay fine, and then I would keep looking. It wouldn't stop me from looking if that's what you're trying to get at.

...

I know stuff already before I even look at the thing, looked at the review. When I wrote my comment, I had no idea of how detailed they'd done a hazard, how detailed they'd gone into the hazard identification, how much effort they put into to looking across the literature. They'd made a very general statement about bacteria and I opposed it, I mean, obviously I do not think that was correct at the general level they'd made it and I didn't take the time then to look for actual evidence. That wasn't my brief, if you like. ...

[732] Dr Everett carried out a literature review soon after the incursion. She recalled one of her colleagues, Ms Stevens, showing her the statement in the Card Paper that bacteria was not pollen transmitted. Similar to Dr Ormsby's view, her immediate response was “Hmm, I don't think that's right”.

[733] Dr Newfield's evidence was that the absence of evidence was a “confusing thing ... it depends on what's actually been tested as opposed to what's reported in the literature from general searches”. She said that now, if her group made a statement in a paper similar to the “no transmission” statement, they would document the sources that have been searched. This was a relatively recent change: she thought 2011 was

the first time she would have made it really clear to one of her staff that this needed to be done. She said if the 12 November 2010 literature review had contained the statement “there are no known bacteria or mollicutes that are pollen transmitted (Nemeth, 1986b)” she “would certainly have asked for more detail about that”. She would check what “transmission” was intended to mean “but in general [she] would say the statement seems ... to be more confident ... than would appear to be justified”. She said with the word “known” removed in the Card Paper it “would make that quite a difficult statement to defend ... it would imply ... that it didn’t occur”.

[734] I consider that, from the literature review, the only basis Dr Clover and Dr Card had for making the statement in the PHEL Review that “there are no known bacteria or mollicutes that are pollen transmitted” was the Nemeth (1986b) paper and the fact that they had not found literature which said bacteria or mollicutes could be pollen transmitted. This was an insufficient basis on which to make the statement in a paper intended to assist with hazard identification for pollen imports unless the limitations of the statement were made clear (that is, the narrow meaning of transmission, they had not considered contamination, they had found no literature which discussed whether bacteria could or could not be pollen transmitted other than the Nemeth reference which was dated and was of limited scope).

Other evidence demonstrating bacteria associated with pollen

[735] The plaintiffs submit that not only was there no evidence to support the statement that was made, there was evidence that demonstrated bacteria could be associated with and transmitted by pollen.

[736] The plaintiffs refer firstly to the MAF internal literature review carried out following Olympos and Kairanga testing positive for Psa. As discussed earlier, Dr Newfield coordinated this work which was carried out by Ms Duthie (an advisor in Risks Analysis (Plants) team), and Ms Campbell (a senior advisor in the Plant Imports team). A draft was prepared and sent to Dr Newfield on 12 November 2010. The final version of the literature review was circulated by Dr Newfield internally on 10 December 2010 with an email stating “[c]ontrary to what I expected, there is evidence for natural transmission of a bacterial disease via pollen” (my emphasis).

[737] This paper began with the following summary:

Summary of the existing information relating to the transmission of plant pathogenic bacteria via pollen

- This report is a literature review to assess the evidence for pollen transmission of plant pathogenic bacteria and the consequent risk of the spread of *Pseudomonas syringae* pv. *actinidiae* (PSA) between kiwifruit orchards.
- The literature search for this report found several studies reporting bacteria associated with pollen. Two authors present evidence of pollen dissemination of the bacteria causing walnut blight and fire blight and Phatak (1980) cautions that there is a real danger of pollen contamination and transmission. Several other studies found plant pathogenic bacteria associated with pollen, but no evidence of transmission.
- Given that bacteria can be associated with pollen and subsequently transmitted to uninfected plants, and PSA is able to infect new growth when sprayed in an aqueous solution, there exists a risk of the spread of PSA by artificial pollination.
- Additionally there exists a risk of the spread of PSA independent of the pollination system if infected plants are present in windy environments with high relative humidity.

...

[738] It then discussed three papers which provided evidence that plant pathogenic bacteria could be associated with pollen. They were summarised as follows:

After artificial inoculation the fireblight causing bacteria *Erwinia amylovora* is able to remain viable on pollen for 40 weeks at 15 °C; however, the bacteria could not be isolated from naturally occurring pollen (De Wael *et al.* 1990).

Śpiewak *et al.* (1996) found the gram negative bacteria *Erwinia herbicola* and *Acinetobacter* sp. on allergenic pollen originating from five species of wind pollinated plants. They did not look at transmission of bacteria to other plants. *Erwinia herbicola* is closely related to *Erwinia amylovora*, the causal agent of fireblight; however, it has been shown to inhibit the activity of *E. amylovora* (Vanneste *et al.*, 1992).

Madmony *et al.* (2005) found *Enterobacter cloacae* as an endophyte of mature pollen of several Mediterranean pines. The bacterium was detected only in mature pollen. *Enterobacter cloacae* causes disease in papaya fruit and in other systems is thought to be transmitted between papaya flowers by fruit flies (Nishijima *et al.*, 1987).

[739] It then discussed “evidence that plant pathogenic bacteria are associated with pollen and transmitted by pollen either in a natural pollination system or in an artificial research environment”. The paper then summarised three papers as follows:

Ark (1944a) found that walnut bacterial blight (*Phytomonas juglandis*) (now known as *Xanthomonas juglandis*) overwintered in diseased leaf and catkin buds and was present on the pollen of diseased catkins. He states that frequently catkins are partially infected, and pollen is readily contaminated and can be broadcast for a considerable distance causing infection whenever environmental conditions are favourable. Leaves experimentally dusted with contaminated pollen developed blight lesions. Ark (1944b) presents further evidence of pollen dissemination of walnut blight when he detected recently pollinated nuts that were completely blighted on trees that had no foliar blight or other lesions. Wash water from young healthy leaves and nuts yielded virulent cultures of blight and he concluded that the disease was induced by abundant contaminated wind borne pollen on leaves and young nuts.

Phatak (1980) conducted a literature review of the role of seeds and pollen in the spread of plant pathogens, suggesting that *Erwinia stewartii* (maize bacterial wilt) and *Xanthomonas juglandis* (walnut bacterial blight) may contaminate pollen and pollen transmission may occur. He indicates that pollen transmission of pathogens is relatively little understood and conclude[s] by stating “there is real danger of host pollen contamination of practically any bacterial pathogen [which] may have infected the host before or at the time of pollen formation/maturation”.

Sabatini *et al.* (2006) set pollen collection monitoring stations at the entrance to honeybee hives in orchard environments known to be contaminated with fireblight (*E. amylovora*). They detected *E. amylovora* in at least one sample of collected pollen. Additionally, in a greenhouse based experiment to investigate pollen transmission of *E. amylovora*, samples of pollen collected by honeybees from artificially inoculated flowers were found to contain the bacterium. This contaminated pollen was subsequently transmitted by the honeybees to flowers of unaffected plants. Subsequent infection was not investigated in these experiments. They concluded that honeybees can act as carriers of live bacterial cells of *E. amylovora* for up to 48 hours.

[740] The paper goes on to note that:

- (a) “The only conclusive evidence of bacteria transmitted by pollen in a natural environment is from a wind pollinated plant” (referring to the Ark Paper).
- (b) Pollen from bee pollinated plants can be contaminated by bacteria and subsequently transferred to unaffected plants. This was in experimental conditions in a greenhouse environment (referring to Sabatini *et al.* (2006)) and it is uncertain how this would translate to a natural environment.

- (c) Psa has been shown to be able to infect new leaves of kiwifruit when applied at high pressure in an aqueous solution (referring to Serizawa and Ichikawa).
- (d) It is uncertain if bacterial infection would be able to cause disease if contaminated pollen was applied in a non-aqueous solution. Further research is required. Kiwifruit are artificially pollinated by various methods.

[741] And further:

If pollen is air blasted on to kiwifruit plants then bacteria could potentially enter through wounds. Additionally if pollen were applied in an aqueous solution then bacteria could easily infect new growth. Bee transmission of infected pollen should not be ruled out as a possibility and should be investigated.

The concentration of bacterium on infected pollen would likely influence the rate of transmission. Therefore research into bacterial concentrations occurring on infected pollen and the consequent rate of infection should be investigated. This also is likely to vary depending on pollination method, with the possibility of increased risk of infection if pollen is delivered in an aqueous solution.

...

In conclusion there clearly exists a risk of transmission of plant pathogenic bacteria by the mechanism of pollen transfer and this risk warrants further investigation.

[742] Dr Newfield said in her brief of evidence that this review “did not find any evidence that would indicate a risk with Psa” and that her risk management team would “have an expectation that evidence must be specific for the pathogen of concern”. This evidence does not reconcile easily with Dr Newfield’s email of 10 December 2010, nor the statements in the literature review itself such as “there exists a risk of the spread of Psa by artificial pollination” and “there clearly exists a risk of transmission of plant pathogenic bacteria by the mechanism of pollen transfer”. This risk arose from logical inferences drawn in the review from what was known about bacteria and pollen, Psa and how kiwifruit plants were pollinated. It was credible scientific evidence and reasoning.⁴¹⁴

⁴¹⁴ Refer “Part 2: Factual and regulatory background”.

[743] Similarly Ms Campbell took a narrow view of the relevance of the literature review when she briefed Dr Butcher about it. She provided her proposed comment about the outcome of this review to Dr Newfield on 12 November 2010.⁴¹⁵ She was proposing to say that “... a number of papers identify the association of bacteria with pollen” but the literature search has not identified “any instances of Psa or other *Pseudomonas* species being transmitted or associated with pollen”. Dr Newfield said this was “fine” except that Ms Campbell should make it clear this review was to verify previous information. Ms Campbell said she would inform Dr Butcher that the import requirements were based on the Card Paper and this search “supports the finding of Card et al”.

[744] Those comments must be read in their context. Psa had been discovered in kiwifruit orchards recently artificially pollinated by pollen from Kiwi Pollen, to whom MAF (including Ms Campbell) had granted import permits for pollen from China and Chile, based on the PHEL Review (which became the Card Paper). It was correct that the literature search had not specifically identified Psa as a risk of being transmitted by pollen (using the wider sense of the word – that is, transferred from the pollen to an uninfected pollen regardless of the method of transfer). That would have provided some comfort to MAF personnel involved in the PHEL Review or permit approvals, including Ms Campbell. However the literature clearly identified a risk of Psa being transmitted in this way based on scientific reasoning about what was known about bacteria and Psa. I consider that Ms Campbell’s comments to Dr Butcher, in saying the review supported the findings of Card *et al*, were (understandably) coloured by what she would have wanted to have seen (namely, that she had not been wrong to have approved the permit).

[745] A separate literature review was also carried out by Dr Everett for Zespri. An initial literature review was carried out for a meeting on 12 November 2010 which she was attending to discuss Psa. This work turned into an interim report dated March 2011 prepared for Zespri, “Preliminary Literature Summary: *Pseudomonas syringae* pv. *actinidiae* and other pathovars of *Pseudomonas syringae*”.⁴¹⁶ This included a

⁴¹⁵ Based on the draft of this literature review.

⁴¹⁶ This was signed off by Dr Everett and Bob Fullerton on 5 April 2011.

section on “Dispersal and Spread” which discussed a number of topics, including “Transmission by pollen” which was as follows:

2.9 Transmission by pollen

2.9.1 Current knowledge on Psa

There is evidence that flowers are infected by this bacterium (Hu et al. 1998; Serizawa et al.1989).

2.9.2 Knowledge based on other pathogens

Card et al. (2007) stated that there were no invertebrates, bacteria, phytoplasmas or spiroplasmas that are pollen-transmitted. However, it has been suggested that *Xanthomonas arboricola* pv. *corylina* (bacterial blight of walnut) is transmitted by pollen to female flowers (Phatak 1980). *Erwinia stewartii* (maize bacterial wilt) may contaminate or even infect maize pollen. Pollen transmission may occur (Phatak 1980). *Xanthomonas juglandis* (walnut bacterial blight) may contaminate pollen, transmission was proven to infected nuts following experimental pollination using such pollen (Ark 1944). Later experiments confirmed this finding (Bradbury 1967). ‘There is a real danger of host pollen contamination of practically any bacterial pathogen which may have infected the host before or at the time of pollen formation/maturation’ (Phatak 1980).

[746] Similar to Ms Duthie’s literature review for Dr Newfield, Dr Everett was assembling knowledge from other pathogens. Also, like Ms Duthie’s review, Dr Everett’s work was carried out quickly. Dr Everett considered it unlikely she looked for more information after the literature review in November 2010 as “they were flat out”. Like Ms Duthie, Dr Everett found the Phatak paper (which in turn refers to Ivanoff, 1933 and Ark, 1944). She found the Ark paper through this.

[747] It appears as though the Phatak paper was first available electronically on one database on 6 July 2009. This was more than two years after the Card Paper was published. It is unclear whether it was available earlier on any other electronic database. In order to obtain an article electronically, a subscription to the particular database is required. Regardless of when that was possible, the article would have been listed in a reputable literature searching package.⁴¹⁷ Dr Everett’s memory was that Plant & Food Research did not have electronic access to *Tropical Pest*

⁴¹⁷ One of the examples Dr Everett gave was CABI which is the one she uses. MAF had different packages at different times. Melanie Newfield said they used Google Scholar and CAB Abstracts. When she first started at MAF CAB Abstracts was used. Google Scholar came in later. MAF also used Crop Protection Compendium.

Management, the journal in which the Phatak paper was published. However, having found the abstract in the literature searching package, she obtained the journal via interloan. It was therefore available to be found when Dr Card was doing his literature review.

[748] The Abstract of the Phatak paper included the following:

Pollen provides a valuable tool for crop improvement but exchange of pollen risks introducing plant pathogens into new areas. A number of viruses, as well as a few bacteria and fungi are pollen transmitted.

[749] Under the heading “Pollen transmission of plant pathogens”, and the sub-heading “Bacteria” the paper stated:

Erwinia stewartii (maize bacterial wilt) may contaminate or even infect pollen of maize. Pollen transmission may occur (Ivanoff, 1933). *Xanthomonas juglandis* (Pierce) Dowson (walnut bacterial blight) may contaminate the pollen; infected nuts developed under experimental pollination with such pollen (Ark, 1944). There is a real danger of host pollen contamination of practically any bacterial pathogen which may have infected the host before or at the time of pollen formation/maturation.

[750] Mr Balestra, an Italian expert on Psa called by the plaintiffs, noted the distinction between establishing definitively that Psa infection can be transmitted by pollen, and establishing that there is a risk of infection due to pollen transmission. He said it was only more recently that it has been definitively established that kiwifruit pollen infected with Psa-V (Psa3) can cause infection in uninfected vines. That said, it was his view that the “risk of transmission of Psa through pollen, has been known and readily ascertainable for many years”.

[751] Similar to Ms Duthie and Dr Everett’s literature reviews, Mr Balestra considered scientific literature reporting showed that certain bacterial diseases can be transmitted via pollination with infected pollen. He referred to:

- (a) Ark (1944): Mr Balestra obtained this from a library. He considered the work was relevant despite it being over 70 years old, about a different plant and bacteria, and using different experimental techniques. He said the work of scientists carried out in the past

remains important in continuing to build knowledge.⁴¹⁸ and this paper remained a leading authority on the topic.

- (b) Ercolani (1962):⁴¹⁹ This showed that enclosing flower buds of healthy plants in a plastic bag containing infected catkins resulted in their infection and in the disease development on the forming fruits. Mr Balestra described Ercolani as “a meticulous, highly-respected and leading phyto-bacteriologist who did ground breaking research” and “[h]is work remains relevant and of scientific substance”.
- (c) Johnson and Stockwell (1988): Studying *Erwinia amylovora*, the causal agent of fireblight of pome fruit, noticed that the stigma represented a favourable environment for the epiphytic survival of the pathogen, as well as anthers, where colonization can lead to the contamination of pollen grains. This in turn favoured the dissemination of the pathogen from blossom to blossom.

[752] Dr Beckett provided a number of other references demonstrating that relying on the single Nemeth reference was wrong. Some of these are more removed from pollen transmission of bacteria than the above references. For example, some were about transmission of diseases by fruit flies⁴²⁰ or bees.⁴²¹ Some were not about pollen

⁴¹⁸ He expressed this as “part of the support to grow our standards” but it is apparent this was what he meant.

⁴¹⁹ This is an Italian paper with an English summary and captions. Contrary to the defendant’s submission this paper was “not accessible”, Dr Everett, whose evidence the defendant cites in support of this submission, said it was difficult to know why she had not cited Ercolani in her paper. She said it was possibly because she did not have access to it apart from the abstract (which was in English), and it was Italian which added more difficulty, she thought Ark was “quite clear that he had demonstrated some pollen transmission of a bacterium and that was the point really”, her literature review was “done very quickly ... as part of the emergency response and it was a means of summarising all the data that we could find quickly” and “it wasn’t intended to be a comprehensive literature review”. I did not take her to be saying it would be irrelevant to a comprehensive literature review even though it was mainly in Italian which she could not read. There was evidence from other witnesses that sometimes papers are translated. Mr Balestra, for example, has had Chinese papers translated. Dr Everett also referred to Chinese articles saying they were initially difficult to translate but their English has improved. Dr Vanneste said translating from Chinese can be costly. Zespri newsletters were translated to Italian to update growers.

⁴²⁰ Nishijima *et al* (1987) refers to a disease in papaya fruit (*Enterobacter cloacae* which causes internal yellowing) reported to be transmitted between papaya flowers by fruit flies.

⁴²¹ A United States Department of Agriculture paper (1992) showed that bacteria (including *pseudomonas*) applied to pollen as a biological control agent for fire blight was transported by foraging bees and deposited throughout an orchard.

specifically.⁴²² And some were not about pollen transmission.⁴²³ Dr Vanneste considered these references were irrelevant because they are not directly concerned with pollen transmission.⁴²⁴ Dr Clover had a similar view.⁴²⁵

[753] One of Dr Beckett's references was to a HortResearch text of which Dr Vanneste was an editor.⁴²⁶ This reproduced an image from a scanning electron micrograph which showed fire blight bacterium adhered to pollen grains with the caption, "[p]ollen infested with [fire blight] could be a mechanism of dispersal". In response to Dr Beckett's evidence, Dr Vanneste explained this paper hypothesised that pollen could perhaps transfer the bacteria which adhered to the pollen, but no data was provided to support this hypothesis. He also considered that Mr Balestra overstated the volume and relevance of the scientific literature on bacterial transmission of bacteria. He considered the literature to be quite limited.

[754] Dr Card did not recall whether he had seen all the papers referred to in Ms Duthie's literature review. He imagined he would have seen them because his search terms would have included "pollen" and "bacteria" which would likely have turned up these papers. He had plenty of time to carry out the review. However he could not guarantee he had read them. Assuming he had found the papers he thought he would have excluded them because "none of them actually are a confirmed experimental data

⁴²² Serizawa and Ishikawa (1993b) in which Psa was shown to infect new leaves of kiwifruit when applied at high pressure in an aqueous solution. But I note that Ms Duthie had found this article and considered it to be relevant using scientific reasoning.

⁴²³ The FAO Guidelines (1994) noted that "[p]ollen may be contaminated with mites and insects. It may also carry fungi and bacteria that cause diseases of bees". This is about bee health. The risk of pests and diseases associated with pollen to bee health had been considered previously by MAF. The FAO Guidelines also discussed viruses that were pollen-transmitted and this information was incorporated into the PHEL Review/Card Paper. De Wael *et al* is about longevity of *Erwinia amylovora* in various substrates such as nectar, honey sugars, propolis and pollen, in order to assess the potential for the bacterium to survive in bee hives over the winter.

⁴²⁴ Similarly he considered Śpiewak *et al* (1996b), Madmony *et al* (2005), and Sabatini *et al* (2006) were not relevant because they are not concerned with pollen transmitting plant pathogenic bacteria.

⁴²⁵ By way of example, he referred to Madmony *et al* (2005) saying this paper reports that *Enterobacter cloacae* is an obligatory endophyte found in association with pollen of several pine species. As discussed in the paper the term endophyte was used to describe bacteria (and fungi) that occur inside plant tissues without causing disease. The PHEL Review/Card Paper considered the transmission of plant-pathogenic bacteria and therefore this paper was not relevant to the discussion. Another example to which Dr Clover referred was Thomson *et al* (1992) stating the paper did not refer to pollen transmission of plant-pathogenic bacteria nor did it provide evidence of natural transmission of bacteria. The paper was not directly relevant to the discussion of pollen transmission of bacteria.

⁴²⁶ Vanneste (2001) Fire Blight: The Disease and its Causative Agent, *Erwinia Amylova*.

to show that any of those pathogens were actually pollen transmitted” in the narrow sense he was considering. If he had been asked to consider the risk of pathogens being transmitted with contaminants he expected there would be some risk.

[755] If Dr Card is correct about whether he was likely to have found them and why he would have excluded them, then their absence from the PHEL Review was because of the narrow view of transmission he (and possibly Dr Pearson) took. Dr Clover, who understood the paper was to cover any method by which pollen transferred an intimately associated pathogen to a plant, said:

- (a) Ark (1944a): The paper was “relevant” to the discussion of pollen transmission of bacteria and speculated that the bacterium may be transmitted naturally via pollen and that this is of significance epidemiologically. However, the paper did not investigate pollen transmission of the bacterium under natural conditions nor is any evidence provided for the hypothesis.
- (b) Ark (1944b):⁴²⁷ The author presented observations that he considered were consistent with pollen transmission of *X. arboricola* pv *juglandis*, including symptoms of walnut blight on recently pollinated nuts on trees that otherwise seemed free of symptoms. The author concluded that it was his belief that the high incidence of the disease might have been attributed to contaminated wind-borne pollen. However, the paper did not provide any experimental evidence to support this hypothesis nor did it consider alternative explanations.
- (c) Ercolani (1962):⁴²⁸ The paper was “relevant” to the discussion of pollen transmission of bacteria as it reported a field experiment in which healthy and infected catkins were introduced into sealed bags around the twigs of a healthy walnut. However the experiment used catkins which are flower clusters or spikes, usually 10-15 cm length

⁴²⁷ This is a short communication reporting a presentation at a regional meeting in the USA.

⁴²⁸ Individuazione di *Xanthomonas juglandis* (Pierce) Dowson in Emilia. *Phytopathologia Mediterranea* 2, 1-10 (in Italian with English summary and figure captions).

containing much plant material other than pollen including the supporting structure and the male flower structures (sepals, bracts and anthers).

- (d) Bradbury (1967):⁴²⁹ The paper referred to both Ark and Ercolani. This paper was “relevant” to the discussion of pollen transmission of bacteria but the evidence was inconclusive. Bearing in mind that the Ark (1944a; 1944b) and Ercolani (1962) papers were published more than 70 and 50 years ago respectively, one might have anticipated subsequent research to have demonstrated natural transmission if this were of significance.⁴³⁰
- (e) Phatak (1980):⁴³¹ The paper considered the role of seed and pollen in the spread of plant pathogens, particularly viruses. This review paper: did not provide much evidence to support its statement of the danger of host pollen contamination of practically any bacterial pathogen;⁴³² did not comment on the possibility of bacteria being transmitted by pollen to infect new hosts; did not provide new information; and was “of limited relevance” to the discussion of pollen transmission of bacteria.
- (f) Johnson and Stockwell (1998):⁴³³ The paper stated “[g]rowth of *E. amylovora* on anthers ... does result in the contamination of pollen grains, which may aid the dissemination of the pathogen from blossom to blossom”. No evidence was provided to support this statement, the statement was inconclusive and the scope was unclear (eg between blossoms on the same or different plants). There was no further discussion of the potential for pollen transmission. The paper was of

⁴²⁹ *Xanthomonas juglandis*, “CMI Descriptions of Fungi and Bacteria” No. 130.

⁴³⁰ Dr Clover also referred to a paper by Miller & Bollen (1946) (cited by Bradbury) in which the authors were unable to repeat Ark’s 1946 experiment.

⁴³¹ The role of seed and pollen in the spread of plant pathogens particularly viruses. *Tropical Pest Management* 26, 278-285.

⁴³² It referred to Ark (1944a) and Ivanoff (1933). It did not discuss the mode of transmission and subsequent research has shown that the bacterium is transmitted by an insect.

⁴³³ Management of fire blight: A case study in microbial ecology. *Annual Review of Phytopathology* 36, 227-248.

some relevance to the discussion of pollen transmission but provided no evidence for this.

- (g) Vanneste (2001):⁴³⁴ The paper included an electron micrograph showing that the bacterium could be found in association with pollen. This figure was obtained following artificial inoculation of the anther surface with a large population of bacteria at a concentration of 10^8 colony forming units per ml. The researchers suggested that contaminated pollen may serve as a means of disease spread, potentially by the action of insects moving between flowers, but no evidence was provided that pollen did transmit the bacterium. This report was “relevant” to the discussion of pollen transmission of bacteria.

- (h) Serizawa and Ichikawa (1993a)⁴³⁵ (and related papers):⁴³⁶ These papers covered the epidemiology of bacterial canker of kiwifruit, the process by which *Psa* infects kiwifruit and the environmental conditions under which infection occurs. None of the papers mention pollen or suggested that *Psa* is pollen-transmitted.

[756] In short, Dr Clover accepted that most of these papers had some relevance to the PHEL Review/Card Paper. He regarded their significance as diminished because the evidence on which the conclusions were based was minimal or not explained or because they had not been confirmed by later research. He regarded the Serizawa papers as not relevant at all because the PHEL Review/Card Paper was concerned with the importation of pollen for breeding purposes. It was not a risk analysis of pollen used commercially to artificially pollinate kiwifruit orchards.

⁴³⁴ *Fire Blight: The Disease and its Causative Agent, Erwinia Amylovora* edited by Joël L. Vanneste (2001).

⁴³⁵ Epidemiology of bacterial canker of kiwifruit. 1. Infection and bacterial movement in tissue of new canes. *Annals of the Phytopathological Society of Japan* 59, 452-459.

⁴³⁶ Serizawa S and Ichikawa T (1993b) and (1994). Epidemiology of bacterial canker of kiwifruit. 2. The most suitable times and environments for infection on new canes. *Annals of the Phytopathological Society of Japan* 59, 460-468; Epidemiology of bacterial canker of kiwifruit. 3. Effect of infection in fall to early winter on the disease development in branches and trunk after winter *Annals of the Phytopathological Society of Japan* 60, 237-244.

[757] The defendant submits that the omission of these papers in the PHEL Review was not an error. Scientists can differ in their assessment of what is relevant and this is a matter of judgment.⁴³⁷ The defendant submits these papers were only marginally relevant. The defendants submit that, even if they should have been included in the discussion in the PHEL Review on bacteria, this would not have impacted on the *Actinidia* section of the PHEL Review.⁴³⁸ That section stated “[t]here are no recorded pests or pathogens that are pollen transmitted in *Actinidia* species”. The defendant submits this statement was accurate in 2006 and 2007 and remained so until at least 2011⁴³⁹ or 2014⁴⁴⁰ when further research specific to Psa and pollen had been completed. However, whether the statement in the *Actinidia* section was accurate, that does not answer the point that the statement about bacteria was incorrect at the time. Nor does it assist with what reliance properly could be placed on the *Actinidia* section of the PHEL Review given the wrong or misleading statement about bacteria and the scope and purpose of the PHEL Review (discussed further below).

[758] The defendant also refers to Eppo’s “express risk analysis” for Psa in 2011.⁴⁴¹ Mr Balestra and Dr Marco Scortichini were engaged as the experts. This analysis

⁴³⁷ The defendant also submits the papers were unlikely to have made it through the editorial process especially because one of the external peer reviewers was already concerned about the number of references. I do not accept this submission. It relies on the comments of referee one which included: “I have never seen a review in which the references form such a large proportion of the whole”. However this comment is in relation to publishing the Card Paper in a scientific journal. It is not directly about what should have been discussed in a hazard identification review to assist with measures for imports of pollen. In any case, referee one also thought the paper should include “key references on seed transmission” and “French studies on pollen of fruit crops”. This suggests the referee may have been less concerned about what references had been considered and more concerned with what the paper added to the scientific knowledge which was the concern of referee two. Also referee two thought “[t]he number of references cited is surprisingly small given the diversity of available literature”.

⁴³⁸ The defendant also submits that, even if the papers should have been included in the discussion on bacteria in the PHEL Review, it is not clear that any risk regarding Psa in kiwifruit pollen should have been extracted from this. This is because the defendant submits that extrapolations from one pest to another is not usually appropriate to impose measures unless the pests are biologically similar. However the PHEL Review was intended to be a discussion of all pests and diseases transmitted by pollen. What measures were appropriate if the PHEL Review had correctly covered the risk of pollen transmitted bacteria is a different point (reliance on the PHEL Review is considered further below).

⁴³⁹ The defendant refers to the research of Stefani and Giovanardi.

⁴⁴⁰ Mr Balestra regards the Tontou *et al* (2014) paper as “significant in supporting pollen at a pathway for Psa” though Dr Vanneste doubts it as being inconclusive (discussed further in “Part 6: Causation”).

⁴⁴¹ Previously Eppo had been doing “full risk assessments”. In 2011 their members asked them to speed the process up a bit and to prepare documents that are easier to read. The express PRA has the same sections as the full PRA but is more user friendly. Since 2011 they have done all PRAs using the express key and if some sections require more detail, they go to the relevant section of the full PRA.

described three pathways for Psa: plants for planting, pollen and tissue culture. The management measures for the pollen pathway was to only use pollen from a pest free place of production and area. Under “possible pathways” and “pollen” the EPPO analysis said:

Card *et al.* (2007) made a review of plant pathogens transmitted by pollen. In this review they state that there are no pollen transmitted bacteria. In November 2010, the Ministry of Agriculture and Forestry (MAF Biosecurity) of New Zealand announced that samples of pollen collected (since 2007) tested positive by PCR for *P. syringae* pv. *actinidiae*. Recently, pollen samples collected with a vacuum device from infected and apparently non-infected orchards at the time of sampling were tested positive (Vanneste *et al.*, 2011). Although it was acknowledged that this finding did not provide sufficient evidence to consider that infected pollen can spread the disease, MAF advised kiwifruit growers to use only pollen tested for *P. syringae* pv. *actinidiae* for implementing artificial pollination. For the moment, the possibility that infected pollen could spread the disease cannot be excluded but more research is needed (EPPO, 2011). Studies on pollen transmission are in progress in Emilia Romagna (Finelli *pers. comm.*, 2011).

[759] Under the “probability” of the pollen pathway it said this:

Probability difficult to assess because of the uncertainty. Pollen transmission has not been demonstrated so far. The EWG considered that although evidence is lacking on such transmission, the involvement of pollen in *P. syringae* pv. *actinidiae* transmission should not be excluded and measures should be identified.

[760] Mr Balestra said this assessment was based on information that would have been available to a body completing a risk assessment in 2007. Although Dr Vanneste’s finding about pollen testing positive for Psa was a new matter, the essential principles and science relating to the risk of pollen transmission of bacterial infection were unchanged. In cross examination he was challenged on this and asked why he had not referred to Ark or Ercolani when he was involved with the EPPO express risk analysis. He said he had not read those papers at the time. He included reference to the Card Paper, respecting the work of a single scientist from another country. Despite this paper EPPO concluded the pollen pathway was a risk and measures should be identified.⁴⁴²

⁴⁴² Similarly, the Australian pest risk assessment for Psa in July 2011 referred to the Card Paper but correctly noted this did not exclude pollen contamination. It too imposed measures on pollen.

[761] He explained that because it was a pest risk analysis they were looking at the pathogen, pollen and other vegetable material. In other words, it was not necessary to look for Ark or Ercolani or other bacteria references. This was a pest risk analysis for Psa. They were satisfied there was a sufficient risk that pollen was a pathway to impose measures, while noting the need for further research, on the basis of the information they had. Mr Balestra is a plant pathologist and phyto bacteriologist. His boss had worked for Ercolani for several years. He and Dr Scortichini, and the other experts who were assembled for this work, drew upon their expertise and understanding of kiwifruit in carrying out the express pest risk analysis. Although they had the Card Paper saying there were “no pollen-transmitted bacteria” which they respected, that did not satisfy them that Psa could not be pollen-transmitted.

[762] I note that the PHEL Review was not a pest risk analysis (the heading “Pest Risk Analysis” was removed following Dr Fernando’s comments about this). Dr Card said he knew very little about what a pest risk analysis was when he was writing the paper. The PHEL Review was a literature review and therefore could be expected to have included all relevant literature in contrast with EPPO’s express pest risk analysis.

[763] I accept Mr Balestra’s evidence that the essential principles and science relating to the risk of pollen transmission of bacterial infection had not changed between 2006/2007 and 2011. On the basis of those principles and science the statement on bacteria in the PHEL Review was at the very least misleading and wrong if it was meant to apply to bacteria transferred from pollen to a plant in the pollination process.

[764] Dr Clover acknowledged the following in cross examination:

- Q. As we’ll come to, the final form of the paper includes an unreferenced statement about there being no pollen-transmitted bacteria.
- A. That’s correct. It’s changed in form during the process of the development of the paper in the report.
- Q. In your review of papers in your brief ... that were not highlighted in the PHEL Review, you appear to be criticising some of them for not citing references for certain propositions. Is that right?

- A. I think there is one instance where I refer to Phatak 1980 where he has made a statement but it doesn't seem to be well-supported by the evidence that he provides.
- Q. Right. Is that a criticism with the benefit of hindsight you might make of the PHEL paper regarding bacteria?
- A. I think it's called hindsight bias, but it's difficult now not to be sitting here thinking I wish I'd written that line in a different way.

[765] My conclusion is that, if Dr Card understood the PHEL Review was to have covered pests and diseases intimately associated with pollen and transferred to an uninfected plant during pollination, one or more of Ark, Ercolani, Phatak, Johnson & Stockwell and Vanneste would have been referred to. This is not a conclusion based on hindsight "bias" in the sense that it is a conclusion influenced by the circumstances of the outbreak of Psa which the plaintiffs attribute to pollen and which MAF allowed to be imported on the basis of the PHEL Review.

[766] This is because it is apparent that Phatak and Ark in particular were accessible as both Ms Duthie and Dr Everett found them readily when carrying out their literature reviews in short time-frames. Those references alone showed that the statements "[t]here are no known bacteria or mollicutes that are pollen transmitted" (as it appeared in the PHEL Review on 6 December 2006 when Dr Clover responded to Ms Dickson's query) and "[t]here are no known bacteria or mollicutes (including phytoplasmas and spiroplasmas) that are pollen transmitted" (as it appeared in the PHEL Review provided to Mr Baring on 14 March 2007 before Dr Sathyapala signed it off) were misleading and incorrect.

[767] Moreover, it was readily apparent to scientists with expertise in bacteria that the statement about bacteria was incorrect as Dr Ormsby's evidence shows. The paper referred to fungi associated pollen alongside the statement on pollen transmitted bacteria. If any of the authors had expertise in bacteria it is unlikely the statement on bacteria, as it appeared in the various iterations of the PHEL Review, would have appeared as it did. It was obvious to Dr Ormsby that it was wrong. Unfortunately his concerns about this were not conveyed in a manner which alerted the authors of the PHEL Review of the need for a drafting change. If the scope of the statement was to be limited to a particular form of transmission then it was important that it said so.

Wrong assumption of “pure” pollen

[768] The plaintiffs say that Dr Clover and Dr Card were negligent in their assumption that pollen used for breeding purposes was “pure” and for not making that assumption clear in the PHEL Review.

[769] On this point Dr Card said he was not considering contaminants. If he was undertaking a review of contaminants this could encompass thousands or millions of organisms. He said contaminants could include things such as other pollen. This could extend to other plant material. This indicates he envisaged only pure pollen being considered.

[770] Dr Clover was cross-examined about the earlier view expressed in MAF internal emails between himself and Mr Double that the plants and diseases associated with pollen were a sub-set of those associated with seed. He said this was focussed on very carefully collected pollen under laboratory or sterile and controlled conditions. It was pure pollen to be used for breeding purposes. This was based on his experience of pollen imports at that time. He confirmed that this was also the assumption in the PHEL Review. He considered the scope of the paper (that it was about pollen for breeding purposes) was apparent in the introduction to the work. If he had been asked about pollen imported for other purposes, he probably would have said he did not know about this as he did not have experience on this.

[771] Mr Balestra said it was possible to produce pure pollen in the lab, but it is not easy. He said it would be “very, very difficult” to obtain pure pollen when harvesting it from a plant in nature. The evidence is that kiwifruit pollen is not pure whether it is vacuum collected or hand-picked from closed flowers buds.⁴⁴³ When pollen is milled small flower parts or debris will fall through the mesh with the pollen. Because it is not pure, the pests and diseases associated with pollen are not a sub-set of seeds. As Dr Everett said, because pollen is contaminated with plant material, whatever pests and diseases are on the plant are also likely to be on the pollen.⁴⁴⁴

⁴⁴³ Dr Herrera also said pollen does not exist in pure term.

⁴⁴⁴ Dr Clover made this point in his comments on the Ark and Ercolani papers, noting that they involved catkins which contained plant material other than pollen.

[772] In my view it was not clear from PHEL Review that it considered only pure pollen obtained in a laboratory. It was also not clear it was concerned only with pollen to be used for breeding purposes (as discussed above). This meant these factors were not apparent to RAG or the Plant Imports team when they relied upon it.

Conclusion on negligence

[773] There was a misunderstanding between Dr Card and Dr Clover about the scope of the PHEL Review. There was also an assumption made that imported pollen would be pure pollen. The PHEL Review did not clearly state its limited scope (pure pollen for breeding purposes). The statement about bacteria was at least misleading, and it was wrong if the PHEL Review was to be used for a wider purpose than pure pollen used for breeding purposes where the seed from the host plant would be tested. These were in the nature of process errors rather than involving difficult questions of scientific judgement about which reasonable scientists could differ. They were errors that should not have been made if reasonable care had been taken over these particular matters.

PHEL advice to Plant Imports Team

The respective submissions

[774] The plaintiffs submit Dr Clover's response to Ms Dickson on 6 December 2006 that "[a]s you will see there are no pests or diseases known to be associated with pollen of *Actinidia spp*" was negligent because:

- (a) He misstated the conclusion of the PHEL Review, which was about transmission not association.
- (b) He failed to advise Ms Dickson of the limits of the hazard identification contained in the PHEL Review in that it was restricted to pure pollen used for breeding purposes, when Ms Dickson was dealing with a request to import milled pollen for artificial pollination for commercial application.

[775] The defendant submits:

- (a) The PHEL Review was an input into a new policy towards pollen imports in the context of industry and Government focus on germplasm.
- (b) It was not a risk assessment in itself, but was intended to “assist the risk analysis process by identifying the pests and diseases that are transmitted by pollen” and the Plant Imports team carried out a risk assessment after receiving the report.⁴⁴⁵
- (c) The scope of the paper was obvious from reading it.
- (d) By providing a link to the report and saying “as you will see...” Dr Clover was inviting Ms Dickson to read the report.
- (e) Since no hazards were identified for pollen, its end use was irrelevant.
- (f) It was reasonable to assume Kiwi Pollen’s request was for pure pollen which was not contaminated by plant material.

Was the 6 December 2006 advice negligent?

[776] I accept the PHEL Review was not intended to be a formal risk assessment, of the nature Dr Ormsby set out in the April 2006 policy document, for pollen imports.⁴⁴⁶ As Dr Herrera said, it was a hazard identification step intended to assist when a risk assessment was carried out. Dr Clover’s response must be seen in that context.

[777] Nevertheless Dr Clover’s response to Ms Dickson did misstate the conclusion about *Actinidia*. The conclusion in the PHEL Review was “[t]here are no recorded pests or pathogens that are pollen transmitted in *Actinidia* species”. This was based on the view expressed earlier in the review that “there are no known bacteria or mollicutes that are pollen transmitted”. The conclusion was one about “transmission” in a specific sense. It was not about “association”. Dr Card had not considered

⁴⁴⁵ Although no formal document was produced, the risk assessment that was undertaken was consistent with MAF’s practise for import permits and ISPM 11.

⁴⁴⁶ Risk Analysis Process and Methodology Project: Recommendation on Risk Policy (21 April 2006).

bacteria which might contaminate the pollen and be passed on to a plant during pollination as that would be a very large piece of work. Not appreciating this, Dr Clover told Ms Dickson that the report concluded “there are no pests or diseases known to be associated with *Actinidia* spp”.

[778] Additionally, Dr Clover did not make it clear to Ms Dickson that the PHEL Review was about the risks of pests and diseases transmitted by pure pollen, when used to pollinate a mother plant for breeding purposes, to the newly bred plant. In other words he did not point out the narrow scope of the PHEL Review even though Ms Dickson had provided him with the email from Kiwi Pollen which said the pollen would be used for pollinating kiwifruit in New Zealand orchards. Dr Clover had replied to this particular email. Ms Dickson could not have known from Dr Clover’s response that he had not read this email (or, if he read it, that he had not read it properly).⁴⁴⁷

[779] I accept that Dr Clover’s email invited Ms Dickson to read the PHEL Review.⁴⁴⁸ However I do not accept it was obvious the report was concerned only with the risks of pests and diseases transmitted by pure pollen when used to pollinate a mother plant for breeding purposes. As discussed above there was no statement which clearly set out the PHEL Review’s scope. This is illustrated by the fact that EPPO referred to the Card Paper in their express risk analysis for Psa. There is nothing to suggest that Mr Balestra and Dr Scortichini discounted the paper because it addressed only pure pollen used for breeding purposes.

[780] Dr Clover was asked what he would have said to Ms Dickson if he had understood she was enquiring about milled pollen to come from Italy and China and to be used to pollinate a kiwifruit orchard. He said:

A. As this is pure speculation now and trying to cast my mind back to 2006 I think it’s quite possible I would have asked what milling involved but I think I would be very much aware about my role in this which was I was working in the laboratory and it wasn’t my role to set import requirements. So I would have referred Michele [Dickson],

⁴⁴⁷ Which of these it was does not matter. Dr Clover said “I clearly did not read the attachment. I either did not open the attachment or I did not read in full the contents of the attachment as evidenced by the fact that I refer to pollen being a source of germplasm and it being relevant to the PEQ growth and innovation framework initiative”.

⁴⁴⁸ She was not asked in cross-examination if she did.

as I did, to the review that we'd done. Knowing that this is talking about milling unopened male flower buds and it talks about pollinating kiwifruit in orchards, I speculate that I would have referred Michele Dickson to the introduction in that report which talked about importation for germplasm, but that is speculation.

Q. Dealing with the China point, China is the home of kiwifruit, correct?

A. That's what I understand, yes.

Q. And so it would be a likely source of the bulk of pathogens that naturally associate with kiwifruit?

A. That is a hypothesis but I think at the time there was little known about the pathogen status in China. With regard to the question of China, we had imported previously some nursery stock from China and we had found some unidentified, or previously unknown, rather, pathogens and I believe that Michele [Dickson] was aware of that but I would have highlighted perhaps that we had imported previously from China and found some new pathogens.

Q. So if you'd read that, you would have mentioned that?

A. I could have done. I'm only speculating now. I do not know for certain.

Q. But I think you're saying you would have also had in mind that there were a lot of unknowns about China and pathogen status as you've just said.

A. I would have referred to the evidence that I had that we had had a consignment. I think that came in 2000, 2001 and that we had found a newly characterised pathogen on that importation.

Q. But I'm asking a slightly different question here. You said moments ago that at the time there were a lot of unknowns about what pathogens existed in China. Do you recall saying that?

A. Yes, relating specifically to the experience that I've had with that previous importation.

Q. But that's a piece of knowledge you had. There were also a lot of unknowns. You've just said that. Are you departing –

A. Yes, but that was based on my experience and my evidence. That's why I said that statement.

Q. Right, but one of the things in your mind was that there were a lot of unknowns.

A. Because of that experience in 2000, 2001, yes.

Q. That's a yes?

A. Because of that experience, yes.

[781] As Dr Clover said, this answer is speculation because he did not read (or read carefully) the email Ms Dickson had provided and he therefore cannot be certain what he would have done. However Dr Clover's emails show that he was someone who was willing to assist when his input was sought and responsive to requests made of him. He was a helpful person and a valued colleague. He had a background in the Plant Imports team as a national advisor (as the position then was). Had he realised the import enquiry was for a wholly different use of pollen than was his experience it seems very likely he would have pointed this out. He might also have raised the point that nursery stock from China had arrived with new pathogens although, whether he would have done so, is not important. Simply pointing out the report was about pure pollen (free of all contaminants) for breeding purposes would have alerted Ms Dickson that she would need to consider whether the PHEL Review conclusions could be relied on in determining Kiwi Pollen's request.

[782] This was one adviser seeking input from a scientist colleague about if he had any information about a current risk analysis for pollen. The context of that request was provided with the enquiry. Dr Clover overlooked that context when he responded. While one can understand how a busy but helpful person, like Dr Clover, could make that mistake, it was a mistake nonetheless. It amounts to carelessness in a similar way to the careless driver who looks briefly away from the road and thereby misses a hazard. In these circumstances, I consider Dr Clover's response fell below the standard of reasonable care to be expected.

Approving pollen import permit

The respective submissions

[783] The plaintiffs submit MAF, through members of the Plant Import team (including Ms Cooper and Mr Hartley) and Dr Shiroma Sathyapala (from RAG), were negligent in deciding to grant Kiwi Pollen's request to import pollen. They submit the decision was made without conducting a proper risk assessment, without carrying out any consultation, and without imposing adequate measures to mitigate the risk of Psa.

[784] The defendant submits the decision on Kiwi Pollen was reasonably made because:

- (a) There was no requirement to carry out the risk assessment in any particular way under the SPS Agreement or MAF's internal requirements.
- (b) In 2003-2004 MAF had completed a Pest Risk Analysis for *Actinidia* which neither identified pollen as a pathway or China as a country with Psa.⁴⁴⁹
- (c) It was reasonable to rely on the PHEL Review, which was recent, had been internally and externally peer reviewed, and was intended to be relied upon as an input for hazard identification for pollen imports (and other countries relied on it also).
- (d) Before a permit was issued to Kiwi Pollen, input was sought from Dr Clover who had knowledge and experience on the request, it was discussed between senior members of the Plant Import team and RAG and a collective decision was made to allow the import.
- (e) It was reasonable to proceed on the basis that the pollen being imported would be "pure". MAF had information about how the pollen would be milled and the submission they should have asked more about this is counsel of perfection given with the benefit of hindsight.
- (f) There was no requirement to consult on the import request and it was not best practice to do so. Information about the milling process was best obtained from the importer who had advised the pollen was pure. It is highly speculative to say that consultation would have made any difference to the measures imposed.
- (g) MAF imposed reasonable measures to address the risk of contamination. There was no sufficient scientific evidence available in 2007 to justify imposing more stringent measures.

⁴⁴⁹ Although it was scoped for budwood and tissue culture, fruit was mentioned.

Assessment of the evidence

[785] The evidence shows the decision to allow Kiwi Pollen's first request to import Kiwifruit pollen was made in about 48 hours: that is, when Ms Dickson replied to Ms Hamlyn on 8 December 2006, having been prompted to send the emails to Dr Clover on 6 December 2006 by Ms Hamlyn's email to Mr Hartley that morning. By that time there had been a discussion "within the group". The outcome of this discussion was to approve the request with conditions requiring that hand-collected, unopened male flower buds of kiwifruit be collected, milled and imported and a government issued phytosanitary certificate be provided confirming this. A permit was also required. Later that day, in response to Ms Hamlyn's query, Ms Dickson confirmed the permit could include China. Four days later Ms Hamlyn was advised that the phytosanitary certificate also needed to declare that the pollen had been microscopically inspected and found free of regulated pests.

[786] A formal permit application was not made until 29 March 2007, by which time Mr Baring was handling plant import queries and was considering two other pollen import requests (*Malus* and *Pyrus*). He and/or Mr Hartley recognised the need for RAG sign off before the applications could be approved. RAG, aware of the *Malus* and *Pyrus* applications, approved the use of the PHEL Review. Plant Imports then approved the permit application with the conditions it had earlier set for Kiwi Pollen's email inquiry, minus the microscopic condition. Thereafter all subsequent Kiwi Pollen requests to import pollen were approved on the same basis although the wording on milling changed (discussed further below). The evidential issues concern why and how it was considered these conditions were appropriate and who within MAF was involved in these decisions.

[787] Ms Dickson's evidence was that pollen imports were very rare. During her time at MAF she had probably dealt with only two or three and they were for different purposes. For example one was for a high risk crop and the pollen was imported for experimental purposes with very specific conditions. It was not to be "broadcast out in the environment" but rather held in a "contained situation". She recalled narcissus pollen (the daffodil family) and gentian pollen.

[788] If an import application was for new pollen, she would check the MAF website to see if a risk assessment had been done. She said it was not part of her job to know how kiwifruit pollen would be milled. MAF did not provide specific training about industry practices or pathways, rather knowledge was shared for any particular situation where necessary.⁴⁵⁰ The senior advisors in each area would do their best to keep up to date with what was happening in their areas.

[789] She thought that milling flowers would involve breaking the flowers into quite small pieces, probably drying it and separating pollen from the rest of the milled material but “I can’t say for sure because I actually don’t know”. Whether it could come with live bacteria was a technical question she “wouldn’t really like to answer”. She said that if the senior advisor, Mr Hartley, did not know, then advice from PHEL would probably be sought.

[790] In relation to Kiwi Pollen’s request, she was envisaging “fairly pure pollen”. She was also envisaging pure pollen when she received Dr Clover’s response, although she did not have the technical expertise to be 100 per cent sure about that. She did not raise this issue with Dr Clover as it was for him to draw his own conclusions about this. She had contacted Dr Clover because he was her previous team leader, had been a senior advisor for nursery stock and was regarded as one of the more competent people.

[791] Ms Dickson said that no minutes were kept of discussions “within the group” at this time. She did not recall why it had been decided that the flowers needed to be collected by hand and only unopened buds. It possibly had something to do with protecting the bees. Ms Dickson thought the requirement for milling abroad was intended to reduce the amount of plant material coming into New Zealand as plant material could have easily elevated the risks. Nor did she recall who had required the microscopic inspection requirement but possibly it was raised by PHEL.⁴⁵¹ The

⁴⁵⁰ When she had a plants issue she would go to the plants people. When she had an animal issue she would go to the animal people.

⁴⁵¹ Ms Dickson could not recall who was involved in the decision communicated to Ms Hamlyn on 12 December 2006. She thought Dr Clover may have provided this advice and Ms Hains, Mr Hartley and Ms Cooper were probably aware of it.

purpose would have been to give more confidence that there were not associated diseases with pollen.

[792] Mr Hartley had been in contact with Ms Hamlyn a few months earlier, in August 2006, when she asked MAF to certify her proposed response to the questions that Argentina (SENASA) needed to know for pollen to be imported into that country. From that contact Mr Hartley had some notice of how the pollen was collected, extracted and stored. Around three years earlier, when he was in the Plants Export team, he assisted AQIS, the Australian equivalent of MAF, with clearance of a pollen consignment that did not have a phytosanitary certificate, certifying the pollen had been tested for and found free of Psa as was required by Australia. At that time he searched MAF's database and could find no record of Psa in New Zealand.⁴⁵²

[793] Within Plant Imports, Mr Hartley was responsible for the nursery stock portfolio which included pollen. If someone was wanting to import pollen the initial enquiry would be made to Ms Dickson, later this was Mr Baring.⁴⁵³ When an enquiry was not straightforward, Mr Hartley was responsible for working across the teams to come up with operational measures and requirements which subsequently would be identified in the IHS. He recalled there was discussion amongst the teams about the PHEL Review (or Card Paper) and a lot of importance was placed on it. He recalled some people in RAG questioned the PHEL Review and its scope but they ultimately agreed with it so their concerns must have been addressed.

[794] Mr Hartley understood from it there were no pests or diseases associated with the actual pollen (as opposed to plant parts or any contaminants). He thinks they probably thought that milling would remove extraneous material and freezing it at minus 18 °C would mean that not a lot of insects could survive. He thought the condition for milling overseas was probably to reduce the risk of contamination from extraneous material. However he did not recall any discussion about extraneous material, or whether there were different risk profiles for Italy or China or any mention of Psa.

⁴⁵² Following this, he was advised by the Australian authorities that the requirement for testing and being free of Psa should be removed from future imports for kiwifruit pollen from New Zealand.

⁴⁵³ Mr Hartley does not recall why this transferred to Mr Baring. These events were taking place at a time of staff turnover and reallocation of internal responsibilities within the team.

[795] In my view it is likely that Mr Hartley was involved in the discussions on 8 and 12 December 2006 where the Kiwi Pollen request was considered. He was a senior advisor in Ms Dickson's team. He had been copied into the email and his calendar had blocked out one hour titled "pollen" for 8 December 2006. It is also likely the meeting involved Ms Cooper who was the team manager who would be signing off the permit. And Ms Cooper had been involved in the earlier discussions with Dr Sathyapala and Dr Herrera about importing pollen into PEQ.

[796] It is less clear whether anyone in RAG was involved at this stage of the process, or whether that only occurred when the permit application was formally made or whether any RAG involvement was limited to the *Malus* and *Pyrus* enquiries. It is possible that Ms Cooper contacted Dr Sathyapala about this in December 2006 as Dr Sathyapala was fairly definite she had discussed the hand picked/closed flower buds condition with her. It may have been at this time. However, if it was, it was likely to have been a very informal conversation. That is because there is no record of it whatsoever and later Dr Sathyapala was very careful to get someone with relevant knowledge to review the PHEL Review for the *Malus* and *Pyrus* requests. In my view it is more likely than not, that RAG was not formally involved until Mr Baring was handling the *Malus* and *Pyrus* pollen import requests in March 2007 and when Kiwi Pollen resumed its correspondence with MAF. This is because:

- (a) Ms Dickson has no recollection of involving them when she was dealing with the matter. As a long time employee she had a lot of experience with permit applications. She had previously worked with Dr Clover in Plant Imports when he was the National Advisor and team leader. She had confidence in him, and he had advised there were no pests and diseases associated with pollen.
- (b) In contrast, Mr Baring was involved after Kiwi Pollen had been advised in December 2006 of the conditions on which a permit would be approved. He was relatively new to Plant Imports and had not worked with Dr Clover before. Once he was involved and considering the *Malus* and *Pyrus* requests it was recognised that RAG sign off was required.

- (c) The “one hour” Mr Hartley had blocked out in his calendar for “pollen” on 8 December 2006 may have been at least partly about the upcoming agenda for the 12 December 2006 workshop and Dr Clover’s response that he wanted to see pollen included in this. It does not necessarily indicate any discussion about Kiwi Pollen’s request with anyone outside of the Plant Imports team (other than Dr Clover if they were discussing the workshop).
- (d) In questions from defence counsel Mr Hartley was asked who would have been in “the group”.⁴⁵⁴ He said he could not recall but “the actual members of the group” in Plant Imports were himself, Mr Baring and Ms Dickson at an operational level, and Mr Gower-Collins or Mr Butcher from a group manager level. He said the key members of the RAG team were Dr Sathyapala, Dr Ormsby and maybe Lihong Zhu and Ms Hains, and from PHEL it was just Dr Clover. It was put to him that he had not mentioned Ms Cooper. Mr Hartley thought she was still team leader at this time. He agreed with a proposition that the nature of kiwifruit was such that senior people were likely to be involved.
- (e) In my assessment Mr Hartley’s evidence did not support any wider discussion amongst all the key personnel in Plant Imports and RAG. Rather, in response to propositions from the defendant’s counsel, Mr Hartley was doing no more than guessing as to who might have been involved and accepting propositions put to him but not in a convincing way. He thought Dr Sathyapala would have been involved because it required her sign off. Because it was kiwifruit and MAF was quite hierarchical he thought it would have also gone to a team leader or a group manager. The evidence does not support the involvement of Mr Gower-Collins or Dr Butcher (at group manager level).

⁴⁵⁴ Referred to in Ms Dickson’s to Ms Hamlyn saying the matter has been discussed within the group.

- (f) There is no email trail of any contact with RAG in December 2006 whereas there are emails showing RAG's involvement in March and April 2007.
- (g) I accept Dr Sathyapala's evidence that she was concerned about relying on the PHEL Review because it was not work that had been carried out by RAG. She therefore required further peer review before sign off to use it for risk analysis was given. It would be odd for this process to have been undertaken only in March and April 2007, but not in December 2006, if RAG had been aware of the request.

[797] As discussed above, later in April 2007, Dr Sathyapala was involved in providing sign off from RAG. I consider that she did not involve Dr Ormsby at this time. She had the report peer reviewed internally and discussed the PHEL Review with Dr Clover. She also likely discussed the import request with someone in Plant Imports, likely to have been one or more of Ms Cooper, Mr Hartley and Mr Baring to confirm she had given sign off. However it is not clear she knew about the kiwifruit pollen request when she did so. Rather, the work she tasked Dr Zhu with suggests she did not (despite her view now that she did). The discussion with Plant Imports was therefore more likely to have been about *Pyrus* and *Malus*.

Was a proper risk assessment carried out?

[798] It is clear that a full risk assessment, as per Dr Ormsby's 12 April 2006 procedures was not carried out prior to the first permit granted to Kiwi Pollen or any other Kiwi Pollen permits issued prior to the Psa outbreak.⁴⁵⁵

[799] A risk analysis in terms of those procedures was:

In this context risk analysis can be thought of as a process to provide recommendations on the likelihood of an organism or disease entering, establishing or spreading in New Zealand, its likely impact on animal, plant

⁴⁵⁵ Dr Herrera, prior to her role as manager of PHEL, had been responsible for IHSs. She had not used the Risk Analysis Procedures document, but there was an equivalent document in 2004 when she was involved in IHSs. Dr Ormsby said the 2006 procedures was largely bringing all the information together. He said there was some degree of newness but there is no point in changing everything if it is working.

or human health, the environment and the economy, and the options available for managing the identified risk.

[800] A risk analysis involves considering pests potentially associated with a good or its conveyance:⁴⁵⁶

The scope of an import risk analysis will include organisms or diseases potentially associated with a good or conveyance entering New Zealand, or a particular pathway for a good or goods entering New Zealand.

[801] A checklist for scoping a risk analysis includes the following:

...

2) Describe the nature, source(s) and intended use(s) of the commodity or organism ...

3) Describe the relevant methods of production, manufacturing, processing or testing that are normally applied.

...

[802] The procedures further state:⁴⁵⁷

It is important to also consider organisms or diseases that might be associated with material that is contaminating the risk good, if that contaminating material cannot be easily separated from the goods on import.

[803] Dr Ormsby confirmed that associated hazards include those that come with contaminating material which tends to come with the commodity. When looking at pathways, harvesting techniques, processing and packaging issues, contamination risks and intended application and use would be considered.

[804] As to consultation, the procedures state:⁴⁵⁸

A risk analysis may be either undertaken by either [sic] MAF or an external consultant managed by MAF. Regardless of who undertakes the analysis it is essential that requirements for consultation and scientific rigour are met by establishing a management framework that is appropriate to the circumstances.

...

⁴⁵⁶ Dr Herrera confirmed it was typical for a risk assessment to cover the source of the commodity and its end application. How the commodity is imported (e.g. in a box or a tray) is also considered.

⁴⁵⁷ At 4.3.1.

⁴⁵⁸ Dr Herrera agreed public consultation took place during the risk assessment stage and on the IHS. MAF had a list of interested people/stakeholders for consultation.

Once approved the risk analysis is then published and released for public consultation. ...

[805] The PHEL Review was not intended to be a risk assessment. This was evident from Dr Ormsby's response to Dr Fernando's comment during the peer review.⁴⁵⁹ The PHEL Review was an input, best described as part of a hazard identification,⁴⁶⁰ intended to assist with assessing pollen imports.⁴⁶¹ It did not consider the likelihood of an organism or disease entering, establishing or spreading in New Zealand, the likely impact if it did, or measures to identify a managed risk. Rather it advised of the diseases known to be transmitted by pure pollen. It did not address the risk of contaminants. Nor was any public consultation undertaken.

[806] Dr Ormsby said that if RAG had been asked to do a hazard identification for kiwifruit pollen, how they would approach it would depend on how urgent it was and what question they were being asked to answer. They would do a literature review encompassing pollen generally and go on to consider whether bacteria associated with *Actinidia* presented a potential risk or hazard. This would have led them to consider *Psa* because it was on the pest list. If a pathway included plant material, then they would consider the risks associated with this. If pollen was intended for commercial application then PEQ was not practical although it would be possible to take a small sample for testing.

[807] Dr Ormsby was asked about how people in the risk assessment team would have read the statement in the PHEL Review that "[t]here are no known bacteria or mollicutes (including phytoplasmas and spiroplasmas) that are pollen transmitted (Nemeth, 1986)". He said:

A. Okay, so we're wandering into areas of interpretation of science and published literature. I think I might have said – yeah, okay, so I'll say it now. From, from, you know, I've been doing this as I say for many, many

⁴⁵⁹ Dr Fernando commented "1.1 If it is a Pest Risk Analysis, should be done according to the standard set be [sic] the Risk Analysis team". Dr Ormsby responded to this comment by saying "I do not think this document is trying to be a PRA but rather a summary of information that could be of use to someone undertaking a PRA". These comments appear to have later been removed.

⁴⁶⁰ Dr Herrera explained that this would sit within the hazard identification step of a pest risk analysis. However a hazard identification would normally be a little more summarised than the PHEL Review and would relate to the presence or absence of an organism.

⁴⁶¹ The risk assessment procedures describe hazard identification as an essential first step prior to a risk assessment. It identifies the organisms or diseases which could be introduced into New Zealand that are capable of, or potentially capable of, causing unwanted harm.

years and one of the things I tell this new staff very quickly is that you've got to be very careful about how you read science publications. The methods are really important and you read those very carefully. The results are important and you read those very carefully. But the introduction and the discussion, so the authors' opinions, are less valuable. You should take them on face value and in fact if they, you take the results, the methods and results on face value as much as you can, although sometimes those can be wrong as well, but you've got to be very, very critical about how you read science, and so I don't expect science references, publications, to be 100% correct and I have no – I often, surprisingly often, see statements made by the authors in their discussion which are not supported by the evidence provided in their papers and so I just simply disregard. So this in a sense would be just another one of those, just disregard it.

Q. For you?

A. For risk analysts, for the people that we have in our team, for the way I review papers and the way I review the work that they do, I'm very careful to, if they make a claim I go look at where they got it from and I sort of see if the evidence actually supports the claim made by the authors.

Q. So is that a practice generally in the risk analysis team that a confident statement like the one we're looking at would be disregarded?

A. Would be challenged, disregarded if it's not properly supported. It's, this is a, this paper is not providing unique data in a sense. It's not a research paper. It's a review and so therefore we'd consider it to be secondary literature and we tend to want to work from primary literature.

Q. So if, for example, and this is a hypothetical, but someone had come to you in '06 and said, "I'm about to let 100 kg of pollen come in to be air-dropped on an orchard in reliance on the Card clover paper," am I right, I'm going to list some things one by one and you tell me with each one whether I'm right, you would have said firstly, "Well, hold on that paper doesn't address association or contamination". You would have said that?

A. If I'd thought about it, yes.

Q. You would have said, don't do that because a lot of weight should be put on that one sentence?

A. Certainly, if I narrow it down to that sentence as being important I would have said no you can't, disregard it.

Q. And thirdly you would have said, no risk assessment has been done?

A. Correct.

Q. And then by analogy you would have gone and talked to industry and so on as you did with your ... pollen that you talked about yesterday?

A. Well if I'd been given the job of doing the risk assessment, and I was concerned that I may not have available the best information, I would go

and find that through the various methods we have. One of them, of course, is to talk to experts, that happen to be available. I'm not sure of the experts in New Zealand I would have talked to, but ...

Q. But? Okay, so you've talked about how risk analysis would read it. Did you have any, or do you have any understanding of how those in the team dealing with permit applications might interpret definitive scientific language like this? Or not?

A. No. When I was doing it I knew what I was doing, but I don't know what the others are doing.

[808] Dr Ormsby was surprised to learn later (after the Psa incursion) that kiwifruit pollen had been imported into New Zealand. He looked to see whether any formal risk analysis had been carried out and concluded there had not.

[809] I accept Dr Ormsby's evidence. I acknowledge his evidence about what RAG would have done if they had been asked to assess the Kiwi Pollen request to import pollen was given with the benefit of hindsight. However Dr Ormsby struck me as a careful, highly experienced scientist who was excellent at his job. He was one of a number of MAF witnesses (Dr Butcher was another) who gave evidence, not defensively, but rather in an open manner with a view to helping the Court to determine what happened and why, and what should have happened.

[810] Dr Ormsby's evidence sets out what should have occurred. Unfortunately it did not. Kiwi Pollen's import request was not considered as it should have been. While there is no requirement for a risk analysis to take a particular form, the nature of the application – involving the import of pollen of an important horticultural crop, PEQ was required for budwood of that crop, there had been no risk analysis when the Nursery Stock IHS was issued, and the request was for a new use (commercial application in orchards) – meant that it should have been referred to RAG for a full assessment, rather than for sign off of the hazard identification contained in the PHEL Review (or Card Paper). That was the approach taken when Kiwi Pollen's vacuum collected pollen was proposed. Had it been understood that the PHEL Review related only to pests and diseases transmitted by pure pollen used for breeding purposes the same approach would have been taken with Kiwi Pollen's proposal to import pollen from hand collected closed flower buds.

[811] In December 2006 the MAF Plant Imports team (one or more of Ms Dickson, Mr Hartley and Ms Cooper) placed reliance on the PHEL Review as though it was a risk analysis for pollen. Ms Dickson did not have final responsibility so Mr Hartley and/or Ms Cooper must have been involved. They uncritically accepted Dr Clover's advice that there were no known pests or diseases associated with pollen and/or the statements in the PHEL Review that there are "no recorded pests or pathogens that are pollen transmitted in *Actinidia* species". They accepted this statement because of Dr Clover's knowledge and experience in Plant Imports. In April 2007, when Kiwi Pollen's first permit was issued, Mr Baring, Mr Hartley, and potentially Ms Cooper, relied on Dr Sathyapala's "sign off" on the PHEL Review given in the context of the *Malus* and *Pyrus* enquiries. This meant that neither Plant Imports nor RAG considered how pollen was produced and whether there were plant parts or other contaminants potentially present. Had they done so they would have discovered that pollen comes with plant parts and therefore, as recorded on the *Actinidia* pest list, Psa was a potential risk. Measures additional to those imposed would have needed to be considered.

[812] I do not accept it was reasonable for the Plant Imports team to rely on the advice from Kiwi Pollen that the pollen was "pure". That may have been acceptable if pollen had already been subject to a full risk assessment as nursery stock had. The Risk Analysis Procedures stated that consultation was necessary.

[813] Dr Butcher's evidence about this was:

Q. Okay, so two things. One, you said before that you've assumed that there was consultation on measures before the earlier permits.

A. Well, I would hope that there would have been earlier consultation but I'm not aware of it, yep.

THE COURT:

Q. And is that because the import health standard didn't have measures for pollen so the consultation aspect of that ought to have happened at the time of the first import permit, is that your thinking?

A. Yes, Your Honour. As I said in my brief, there were measures applied in the permit such that closed buds hand-collected were the requirement in the permit and, as I said in my brief, I don't know the reason who that was put in there but I can only assume that there had been an assessment done at some point and I would assume, assume or hope, that there was some consultation at that point, yes.

CROSS-EXAMINATION CONTINUES: MR SALMON

- Q. And if there had not been then there should have been at each later stage?
- A. Certainly as a matter of course we see the benefit in consultation and I would, you know, certainly there's current practice that we seek as much consultation and engagement with stakeholders as we can, yes.

[814] Dr Butcher was explaining that consultation was necessary at some point in the process. As the IHS simply referred to the need to obtain a permit, the first permit for a pollen import should have triggered consultation. That evidence is consistent with s 22(6) of the Biosecurity Act which required consultation before the chief technical officer recommended that the Director-General adopt an IHS. This aspect of the Nursery Stock IHS effectively had been postponed in relation to pollen. Dr Butcher's evidence was also consistent with MAF's Risk Analysis Procedures.

[815] In my view consultation with industry ought to have occurred prior to MAF approving Kiwi Pollen's first permit application to import kiwifruit pollen. It seems that it did not because no one involved in approving the permit turned their mind to it. That was quite possibly because there was already an IHS that referred to pollen and the IHS had been consulted upon. Once again, this was an oversight by all those involved in approving the Kiwi Pollen permit in December 2006 and as confirmed in April 2007.

[816] The defendant submits it is speculative to say that consultation would have led to MAF learning that pollen would contain plant parts and so would have been put on inquiry to check the *Actinidia* pest list for nursery stock. In my view it is likely kiwifruit industry groups would have responded to consultation about kiwifruit pollen imports. Industry groups had previously responded to MAF consultation documents. The kiwifruit industry groups were a well-organised, responsive group as illustrated by their urgings on MAF between July and October 2010 about Italian kiwifruit imports, and their immediate and cohesive response when Psa hit New Zealand. At the very least, consultation on pollen imports in late 2006 or early 2007 may have caused Zespri and Plant & Food to query in July to October 2010 whether any pollen imports had been approved by MAF.

[817] In summary, the MAF personnel involved in deciding on the conditions on which Kiwi Pollen imports would be approved (in December 2006 and April 2007) did not take the care that reasonably was to be expected of them in the circumstances they were in. I appreciate they were busy and understaffed. However there was no pressing urgency to respond to Kiwi Pollen's request. The proper response was that which Mr Baring gave when Kiwi Pollen's proposal to import vacuum-collected pollen was raised. Ms Hamlyn accepted the response she was given about this without any difficulty. There is no reason she would have objected to a similar response to her first request.

[818] The failure to take reasonable care involved failing to identify the need for consultation on Kiwi Pollen's request, or otherwise obtaining more information about clarifying the pollen milling process. It also involved not obtaining formal confirmation from RAG in December 2006 that the PHEL Review could be relied upon for Kiwi Pollen's import request. In March/April 2007 it also, most probably, involved failing to provide the full details of Kiwi Pollen's request to RAG when seeking RAG's sign off to use the PHEL Review in response to the *Pyrus* and *Malus* enquiries. Alternatively, in March/April 2007 if Dr Sathyapala was involved in signing off the PHEL Review for use in relation to Kiwi Pollen's request at that time, in not having someone senior within RAG to review it for use in relation to kiwifruit (in addition to the review carried to for the *Malus* and *Pyrus* enquiries). Once again these were not matters of difficult scientific judgement or complex policy choices about measures about which different scientists and advisors reasonably could differ. They were process errors that, with reasonable care, would have been avoided.

Omitting the microscopic inspection condition

The respective submissions

[819] The plaintiffs submit that members of the Plant Imports team, and Mr Hartley and Ms Cooper in particular, were negligent in failing to ensure the import condition included the condition requiring microscopic inspection. They further submit that either Ms Dickson was negligent in failing to draw the condition to Mr Baring's attention or Mr Baring was negligent in failing to include it. They say that if the condition had been included this would have meant that inspection by the Chinese

authorities would have occurred. They say that this would have identified that the consignment contained anthers rather than pollen.

[820] The defendant submits the evidence of Ms Dickson supports a finding that the microscopic condition requirement was included in the emails handed over to Mr Baring. They also say that it has not been shown that removing the condition was causative. That is because of the unreliability of tests at that time for testing pollen for Psa.

My assessment of the evidence

[821] Dr Sathyapala's evidence was that she believed it was very likely that she had discussed this condition with Plant Imports to deal with the risk of cross-contamination.⁴⁶² This may have related to the *Pyrus* permit, in which she was involved, which had this condition. I have found it is not clear that Dr Sathyapala was aware of the kiwifruit pollen imports in any specific way. That is consistent with her not recalling them when the pressure went on about what to do about Italian imports of fresh fruit in 2010 (albeit fresh fruit was then her area, not pollen).

[822] There is clear evidence that microscopic testing was discussed at the meeting between Dr Sathyapala, Dr Herrera and Ms Cooper on 29 August 2006. That discussion was about pollen generally although the email correspondence at that time confirms that Dr Sathyapala had *Actinidia* in mind at that time.

⁴⁶² Generally I did not find Dr Sathyapala's recollections to be reliable: she tended to assert she could remember the content of discussions which took place around eight to ten years ago, and who these discussions were with, in a way that none of the other witnesses did. It was apparent that she was, as is understandable, heavily reliant on documentary records and had very little independent recollection outside of that. In some of her answers she would assert things with some conviction but then resile from them when presented with evidence that was contradictory. For example it took some time for Dr Sathyapala to acknowledge that Dr Ormsby had told her that he had concerns about the reports. In saying this I did not regard Dr Sathyapala as dishonest in any way whatsoever. She was doing her best to give accurate evidence in difficult circumstances. She no longer works for MAF. She lives in Rome and has a busy role requiring frequent international travel. She gave her evidence via AVL late at night (Rome time). These events were a long time ago and she was implicated in the plaintiffs' claim because she had given "sign off" to using the PHEL Review. She appeared to accept her involvement in some matters because she was clearly involved in other matters and because, had things been carried out properly, she would have been involved.

[823] There is, however, no email or other documentary record to suggest that Dr Sathyapala had any direct involvement in any discussion which resulted in Ms Dickson's email on 12 December 2006 to Ms Hamlyn when this was added as a requirement. An involvement at that time is inconsistent with her evidence that her first direct involvement that she could recall was when Mr Baring discussed with her Kiwi Pollen's proposal to import vacuum collected pollen. This was not until May 2007.

[824] What seems more likely is that this condition came from Ms Cooper. She too had been present at the 29 August 2006 meeting where this had been discussed and was in the same team as Ms Dickson. If Ms Cooper raised it with Dr Sathyapala at this point, I consider she must have done so in a general way without it being clear to Dr Sathyapala that this was for measures for a permit the Plant Imports team were about to approve.

[825] Whether it was discussed with Dr Sathyapala or not, I accept that the condition for microscopic inspection was intended to address contamination risks. For example, contamination by insects. This, along with hand picked closed flower buds, were the intended measures to address the contamination risk. It is not clear now whether anyone thought about the contamination risks of plant parts or had any particular contaminants in mind.

[826] Whatever the genesis of the condition for microscopic testing, there are two reasons why it may have been omitted. One possibility is that it was not forwarded to Mr Baring by Ms Dickson. The other is that Mr Baring and/or Mr Hartley decided to delete it once the PHEL Review had been given sign off by RAG. At this juncture it is difficult to say which of these two is the more likely. However on balance it seems more likely that a handover or documentary record keeping mistake was made in some way. RAG and Dr Clover had envisaged microscopic testing either offshore or in PEQ. Further, Mr Baring was careful to refer the *Pyrus* and *Malus* enquiries to RAG. He also approached the vacuum collected proposal from Kiwi Pollen correctly. He seemed to have been an effective and able nursery stock adviser. These factors suggest a problem with the handover or the keeping of records occurred in some way (whether by Ms Dickson not providing the email, or by Mr Baring not noticing it or keeping it).

[827] In any event, none of this matters. That is because it would be speculative to say what would have happened if the condition had been included. There was no evidence from the Chinese authorities about how they would have approached providing the necessary declaration had the microscopic testing condition still been retained by the time the permit pursuant to which the anthers consignment was issued. At that time the permit stated that “the pollen may be milled prior to import”. There was evidence from Ms Hamlyn that anthers were traded. The Chinese authorities may well have been unconcerned that they were testing anthers rather than milled pollen. Lastly, there was no evidence about whether Chinese microscopic testing would have detected Psa.

Change to wording of permit

Submissions

[828] The plaintiffs submit the change to the wording of the permit to say “the pollen may be milled prior to import” was negligent. They submit that Ms Hains was negligent in authorising a permit that was outside her area of competence. They say those involved in amending the wording – likely to have been Ms Campbell and Ms Ormond – were negligent in doing so. They say that this wording was ambiguous. They say this may well have led to confusion with the result that anthers, rather than pollen, were imported.

[829] The defendant submits the wording change was not significant and did not change the meaning of the condition. The defendant also submits that the wording change was not causative of the importation of anthers rather than pollen.

My assessment

[830] In my view the wording change was ambiguous. A careful reading of the permit overall, depending on who the person was and the circumstances in which they were reading it, would probably conclude the import was for pollen and not anthers. However that is by no means certain because “may” does not usually mean “must” (although that is context dependent) and anthers do contain unmilled pollen.

[831] Once again, however, this has no consequence. That is because there is no evidence that the permit wording caused the exporter to be confused. More likely there was a misunderstanding between Kiwi Pollen and its Japanese business associate helping with the importation on the one hand and the Chinese orchardist on the other.

The Italian outbreak

The respective submissions

[832] The plaintiffs submit that MAF personnel, including Dr Sathyapala, were aware of the Italian outbreak from an early stage. They say that MAF ought to have initiated a pest risk assessment for Psa and stopped kiwifruit imports. The plaintiffs submit that, had it been carried out properly, it would have identified pollen imports as a potential pathway for Psa to enter New Zealand. If that had been carried out by July 2009, then it would have prevented the June 2009 anthers consignment from entering the country or it would have led to MAF locating the consignment at Kiwi Pollen's premises.

[833] The defendant submits that MAF could not reasonably have appreciated before December 2009 (when it received the November 2009 EPPO alert) that an outbreak of Psa was causing serious harm to Italian orchards. The defendant also says that MAF responded appropriately to the EPPO alert by urgently reviewing all pathways. Lastly, the defendant submits the scientific knowledge did not justify imposing measures on either fruit or pollen imports.

My assessment of the evidence

[834] There was evidence that Dr Sathyapala and Dr Vanneste had an email exchange in October 2008 about Psa in Italy. Dr Sathyapala instructed a colleague at this time to find out whether a risk assessment had been done for Psa. The colleague provided the Psa data sheet. In my view, nothing more could be expected from Dr Sathyapala at this point, given the general nature of Dr Vanneste's communication and that, at that time, the Psa outbreak in Italy was not widespread, and nor were the symptoms severe. In late March 2009 Dr Vanneste travelled to Italy to visit orchards. The Italian outbreak was confirmed as Psa. In April 2009 Plant and Food (Vanneste

and Manning) prepared a report for Zespri entitled “Bacterial canker on ‘Hort16A’ Kiwifruit in Italy: report on visit to Latina, 30 March – 7 April 2009”.

[835] The report:

- (a) Confirmed that the disease was caused by Psa. It described the symptoms. It noted that three different and independent laboratories had confirmed it was Psa.⁴⁶³
- (b) Noted disease expression on the Hayward variety was possibly two to four weeks behind the earlier developing symptoms on the Hort16A variety.
- (c) Noted that both male and female vines were affected, although often the first symptoms were seen on males.
- (d) Said that infection occurs when the vines are injured by wind or hail, frost, insects, cultural methods, or damaging sprays and that it seems that Psa can be spread between orchards by wind. However Plant & Food had no evidence that bees or pollination helped the dispersal of the pathogen.

[836] This report pre-dated the 30 April 2009 permit to Kiwi Pollen to import kiwifruit pollen from China (and the similar permit issued that day for pollen from Chile). However it is not said that this report was provided to Dr Sathyapala.

[837] The plaintiffs next rely on an email from Dr Everett on 6 July 2009 in which she asked Dr Berry if Psa was high on MAF’s priority list given the severity of the epidemic in Italy. Dr Sathyapala believes she would have discussed this within the team. I accept that this might have been given higher priority than it seems to have been given at this time. It is less clear what the outcome of that would have been given the approach Dr Sathyapala later took to the issue of Italian fresh fruit.

⁴⁶³ Balestra (Tuscia University), Scortichini (Rome), and Plant Protection Services in Bologna.

[838] The plaintiffs next rely on the December 2009 EPPO alert. However the evidence is that Dr Ormsby did carry out a mini risk analysis but did not locate any pollen imports. He had not been involved in approving Kiwi Pollen's imports. I have found that it is unlikely that Dr Sathyapala had any detailed knowledge of them either. Dr Sathyapala was unable to say why she had not raised pollen imports when Dr Ormsby had reported to her on his mini risk analysis. My assessment is that Dr Sathyapala did not recall why she had not said anything because, like her evidence on other points, she had no clear recollection of what her involvement in the pollen imports had been. She made assumptions based on documentation but no documentation showed her direct involvement in approving any specific kiwifruit pollen import request.

[839] The real problem was that MAF's QuanCargo records did not enable reliable searching of importations that had occurred. Had it done so, things might have been different. But that is by no means clear. By this time Kiwi Pollen had cycloned the anthers and one or more of the possible pathways for Psa to infect Kairanga and Olympos were in play.

[840] The same applies to Dr Vanneste's report in September 2010. On 29 September 2010 Dr Vanneste emailed Mr Limmer, copying a number of others from Zespri and Plant and Food. This followed a request from Mr Limmer earlier that day for an urgent answer on the risks of Psa on fruit, graft wood and pollen. The urgency was because the import season was about to begin and so fruit would be arriving in New Zealand. Dr Vanneste replied as follows:

...

We have shown that pollen from infected orchards does carry live cells of Psa. Therefore, kiwifruit pollen from infected orchards should not be imported in New Zealand for pollination purposes.

We know that Psa can survive inside the tissues of infected canes, even though no or little symptoms are visible. Therefore graft wood from infected areas should not be imported into New Zealand.

About fruit. If Psa would be present on the surface of kiwifruit (something we have not shown but which we suspect does occur) then we now know that the schedule required of the importers (a certain amount of time at cold temperature, the amount of time varies with the temperature) will not kill Psa (we work at about 0C). Therefore fruit do pose a biosecurity risk.

So it is easy to have a definitive position for pollen and graftwood and a strong opinion about fruit. Please keep in mind that all we are showing is potential of infection. We have not shown that infected pollen, graftwood or fruit would lead to infection. This has been the point of contention between Australia and New Zealand about us exporting apple to Oz from orchards where fire blight might be present.

...

[841] At this time pollen was not in Zespri's front of mind as it was not aware of what pollen imports may have taken place and it was not involved in such imports. It was aware that New Zealand exported pollen.

Conclusion

[842] In summary, mistakes were made by MAF personnel in responding to the Italian Psa incursion. However I am not able to say that they were negligent mistakes by individual MAF personnel. Rather, with the benefit of hindsight, it can be seen that more could have been done in 2009 and 2010, and if it had been, there was a chance the June 2009 anthers consignment would not have set in train one or more of the pathways. It is to be remembered that Zespri was on the ground in Italy. Zespri's sense of urgency about the implications for New Zealand did not really arise until around July 2010. By then the focus was on fruit because that was known to be arriving in New Zealand. Even then, MAF's judgment on the basis of the science and policy issues was that measures could not be justified. That might have been the wrong judgement to have made but it was one made with much thought and care. In my view, the plaintiffs have not established a lack of reasonable care by MAF at this stage of the matter.

Conclusion

[843] The plaintiffs have established MAF personnel breached a duty of care to them in some of the ways alleged. In particular, MAF personnel failed to take reasonable care in the following respects:

- (a) The scope of the PHEL Review was not clearly set or clarified as between the principal author and the MAF scientist who was

supervising the principal author. This meant that relevant literature about the association of bacteria with pollen was omitted.

- (b) The PHEL Review overstated the conclusion that could be drawn about pollen and bacteria generally from the reference on which it was based (which concerned a subset of bacteria that is transmitted differently to bacteria generally).
- (c) The PHEL Review was misleading about the association of bacteria and pollen in that it made an overly definitive statement given:
 - (i) the limited the basis on which it was made (a particular and specific mechanism of pollen transmitted pests);
 - (ii) the lack of clarity in the PHEL Review about its scope (both as to the particular and specific mechanism of pollen transmitted pests and as to the purpose for which the pollen would be used); and
 - (iii) its assumption of “pure” pollen.
- (d) A member of the Plant Imports team sought information from the MAF scientist who had supervised the PHEL Review about the risks associated with pollen in order to assist with Kiwi Pollen’s request to import pollen. In response to that enquiry the conclusion in the PHEL Review in relation to *Actinidia* was inaccurately conveyed and provided without noticing that the use to which the pollen would be put was different to that on which the PHEL Review was premised.
- (e) MAF personnel failed to obtain a formal risk analysis sign off that the PHEL Review could be relied upon specifically for Kiwi Pollen’s import permit application and/or failed to consult on Kiwi Pollen’s application or otherwise to make sufficient enquiries about the pollen milling process, when this was the first time a permit to import kiwifruit

pollen to be used commercially for artificial pollination of kiwifruit orchards.

[844] Other matters relied on by the plaintiffs did not amount to negligence or were not shown to have been of consequence.

Part 5: Breach – second cause of action

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Introduction

[845] This part of the judgment concerns the plaintiffs’ second cause of action. The plaintiffs allege that a MAF inspector was negligent in giving border clearance to a consignment of kiwifruit anthers in June 2009 under Kiwi Pollen’s permit to import kiwifruit pollen from China. The plaintiffs say that these anthers or the pollen therein carried Psa into New Zealand, led to its incursion and caused the loss claimed for in this proceeding.

[846] The plaintiffs seek to establish negligence based on the following points:

- (a) If inspection of the consignment was carried out, then it was carried out negligently because it would have been discovered that the

consignment was of anthers when the permit was for pollen and the consignment would then not have received clearance.

- (b) If an inspection was not carried out then this was negligent because the Nursery Stock Import Health Standard (IHS) and MAF's Clearance of Plants Process Procedure document required the consignment of anthers to be inspected before clearance was granted (which would have led to the discovery of anthers and no clearance issued).
- (c) There were material discrepancies between the import permit and the phytosanitary certificate which should have led to inspection with the same result as above.

[847] The defendant submits:

- (a) No inspection took place.
- (b) An inspection was not required by s 27 of the Act, the IHS or the Process Procedures. It was a matter for the inspector's discretion and the discretion not to inspect was exercised non-negligently in this case.
- (c) The discrepancies in the documentation did not raise any biosecurity risks and, at this distance, it cannot be said what would have happened if the discrepancies had been identified and raised in one of the processes MAF had for making decisions about this.

[848] The issues are:

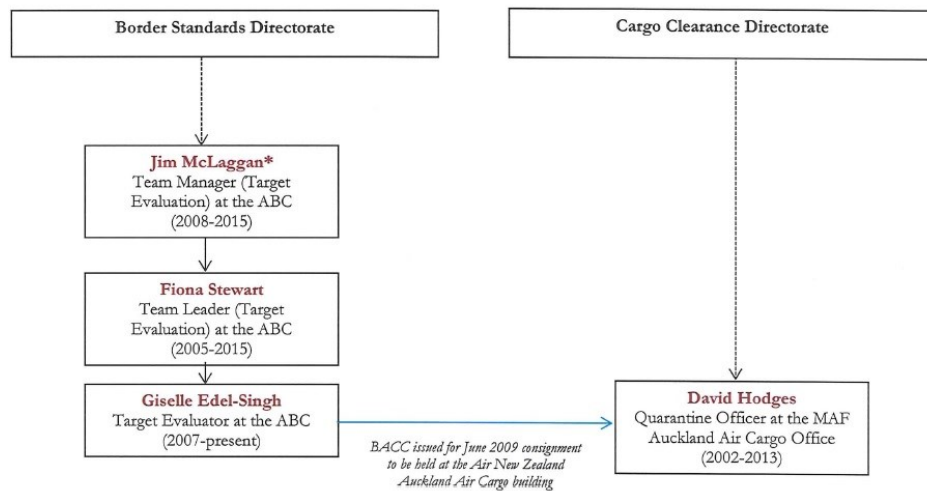
- (a) Was there an inspection of the contents of the consignment?
- (b) Did s 27 of the Biosecurity Act, the IHS or MAF's Process Procedures require an inspection of the contents of the consignment?
- (c) Were there material discrepancies in the documentation which should have led to an inspection of the contents of the consignment?

Chronology and personnel

[849] The key sequence of events in clearing the June 2009 anthers consignment are as follows:

- (a) The consignment was imported under an import permit issued on 30 April 2009. The import permit was for pollen of the species *Actinidia deliciosa* from China. The exporter name was listed as Bexley Incorporated.
- (b) On 23 June 2009 MAF target evaluator Giselle Edel-Singh, issued a “hold” for the consignment. This recorded, among other things, that the consignment was arriving on the following day, and that a phytosanitary certificate was required. She also added a charge of \$22.22 to be invoiced to the importer (described on the MAF computer system as “Admin associated with physical insp (15”).
- (c) The consignment arrived on 24 June 2009 and was held by MAF pending presentation of the original phytosanitary certificate.
- (d) The phytosanitary certificate was put on a courier to Auckland on 26 June 2009.
- (e) The phytosanitary certificate was dated 8 June 2009. It recorded the name of produce as Kiwi Pollen and the botanical name of plants as *Actinidia arguta* (a different species from that named in the permit). It listed the consignor (the exporter) as Hangzhou Yuehao Agricultural Technology Consulting Co, Ltd, not Bexley Incorporated.
- (f) On 30 June 2009 MAF quarantine inspector David Hodges granted biosecurity clearance to the consignment.
- (g) On the same day Mr Hodges rendered an invoice for \$25 (including GST) to the freight forwarders with the narration “Admin associated with physical inspection”.

[850] Some of the personnel who gave evidence about the events are shown below:⁴⁶⁴



Background evidence

[851] New Zealand's biosecurity regime has three parts: pre-border, border and post-border. Steve Gilbert, the current director of Border Clearance Services (BCS) for the Ministry of Primary Industries (MPI), described these in the following way:

- (a) the pre-border stage involves everything done to manage biosecurity risk before goods actually arrive in New Zealand (for example: standard-setting, pest management by producers, offshore treatment of goods, inspection and certification by the exporting country's government and offshore quarantine);
- (b) the border stage involves managing biosecurity risk from the moment the goods arrive in New Zealand until they are given clearance (for example: giving clearance to consignments, risk-screening, quarantine and the destruction of goods); and
- (c) the post-border stage involves the management of biosecurity issues once goods have been given clearance and allowed entry into the country at large (for example: post-incursion response teams, the

⁴⁶⁴ Fiona Stewart's name is now Fiona Willmot.

implementation of long-term pest management strategies and readiness- or preparedness-building projects).

[852] Barry O’Neil is the head of Biosecurity New Zealand in 2009 and current Chief Executive of KVH. He described the biosecurity regime’s efficacy in preventing risks from materialising as being very reliant on the pre-border stage. This is because of the bottlenecks which are inherent at the border of an open economy where scarce biosecurity resources are stretched out over millions of goods, mail and people that arrive in New Zealand every year.

[853] Statistical information drawn from MAF’s electronic database records that in the 2009 calendar year 238,658 sea freight and 48,283 air cargo consignments were cleared by MAF, 11,846 sea and air cargo items were seized by MAF, and 4,452,879 passengers arrived in New Zealand.⁴⁶⁵ Additionally, in the 2009/2010 financial year, 39.1 million international mail items were cleared. The sheer volume of goods and containers arriving in and leaving New Zealand by air and sea also means that there is an expectation that containers arriving here will be turned around within five days to allow them to be used for exporting.

[854] Mr Gilbert calculated that if every shipping container (which is in and of itself a risk good) was inspected by a MAF Quarantine Officer, this would cost importers \$79.5 million per year and would require MAF to employ 550 staff just for this purpose. This would not include inspecting the actual packages within the containers.

[855] The realities of this bottleneck include “inevitable volume and time considerations at the border”, which mean that the biosecurity system is predicated on a need to manage risks offshore to as great an extent as possible and to deal with the remaining issues at the border. The intention is that things should arrive in New Zealand already meeting biosecurity requirements so that they may be let through the border stage expediently. Mr O’Neil described this as a “high trust environment” where international standard setting, official inspection, treatment and certification by

⁴⁶⁵ MAF/MPI’s electronic database suite is called Quantum and it integrates the systems known as QuanCargo, Quanmail and Quanpax. These record information relating to the management of biosecurity risks associated with cargo, mail and passengers coming into New Zealand respectively.

offshore government departments, and auditing or accountability measures are all crucial to the proper functioning of the system. Mr Gilbert said this high-trust environment was consolidated by an enforcement regime for non-compliance where strict rules and heavy penalties worked to incentivise domestic players to accurately declare and certify the products they are bringing into the country.

[856] Mr Gilbert explained that there is simply no need to open and inspect every single consignment that comes into New Zealand because MAF already knows a lot about those consignments upon arrival. They know the importer, the origin and what has been put in it. This is because this has been declared by the importer who has also paid a customs duty and because the consignment has been certified by the equivalent department of the country of origin on the basis of international agreements between the New Zealand government and the foreign government. The biosecurity regime does not expect the inspection of every container that comes in because this would be tantamount to New Zealand closing its borders. As Mr Gilbert put it:

If we took a totally cautious approach and inspected 100 per cent of all consignments coming in to New Zealand, the reality is that with the sheer volumes coming in, we would cease to be a trading nation.

[857] Mr O’Neil explained that the fundamental aim is to keep out significant risks based on expert risk assessments, justified by current scientific knowledge and economic and environmental needs. This is because inspecting all goods or treating all goods with the same amount of caution will mean that consignments that are higher risk will receive less attention than they should due to time and resources being taken up in the cautious treatment of lower risk consignments. New Zealand’s system therefore uses the information it has that accompanies a specific consignment of goods (for example: customs declarations, air waybills, manifests, invoices, certifications by the foreign government department and so on) to profile the biosecurity risk associated with that consignment to decide how much caution it should be dealt with.

[858] The evidence from witnesses from governance and management roles within MAF, such as Mr O’Neil and Mr Gilbert, was that no biosecurity system in an open economy can be predicated on the aim of keeping the country 100 per cent biosecurity risk free. The post-border stage responds to the residual risks that slip through the first two stages.

The passage of goods across the border

General

[859] Mr Gilbert describes BCS, along with the Intelligence, Planning and Coordination Service, as concerned with the “crossing-the-border” aspect of the system. Intelligence uses analysis and profiling to identify risk goods and direct effort from BCS staff towards the greatest risk. The majority of BCS activities are funded through levies and fees charged on a cost recovery basis.⁴⁶⁶

[860] If a good is allowed to be imported, MAF must still be satisfied that it meets its import regulations and rules and does not pose a biosecurity risk. These import regulations and rules are set out in MAF’s IHSs.⁴⁶⁷ All goods entering New Zealand are deemed to pose a biosecurity risk until they have been assessed in some way. This assessment varies depending on the level of risk associated with the good:

- (a) Some goods are considered non-risk and are cleared almost automatically through an electronic system which categorises goods based on the Customs Tariff Code used by the importer to bring it in to the country.
- (b) Others might be given clearance from a Target Evaluator based on documentation accompanying an application for clearance.
- (c) Many risk goods are given clearance on the advice of an accredited person after they have opened and unloaded a sea container.⁴⁶⁸
- (d) Some risk goods are given clearance by a Quarantine Officer after conducting an inspection or other action.
- (e) Others still are never given clearance in the usual way because of the need for specialist testing or observation (for example, in the case of

⁴⁶⁶ See “Part 2: Factual and regulatory background” for more detail.

⁴⁶⁷ Biosecurity Act 1993, s 22.

⁴⁶⁸ These are non-MAF/MPI employees of private businesses operating transitional facilities who have been trained and appointed pursuant to the Biosecurity Act 1993.

zoo animals) or are only imported to be kept in quarantine until they are re-shipped or destroyed (for example, chemicals for testing and laboratory usage).

[861] The place where risk goods are kept until they are given clearance by MAF are called transitional facilities. These are usually run by large or small private companies or individuals, such as airlines, shipping lines, freight companies and importers. They operate based on set standards created pursuant to the Biosecurity Act 1993. They are subject to continuing monitoring, auditing and accountability oversight from BCS. As at March 2017, there were 4,985 transitional facilities in New Zealand.

Importer application for clearance

[862] The process begins with an importer or their agent (for example, a customs agent or freight forwarder) making a customs declaration. In order to make these declarations they need to receive training and undergo police checks. This is why most importers will tend to use a customs agent or freight forwarder to arrange for clearance on their behalf. A customs declaration entry may be made at any time before the relevant consignment arrives in New Zealand or within 20 days of arrival. Every import entry (representing a single declaration) that has a value of over \$400 is required to have a tariff code. If it is worth less, a manifest is sent to MAF who carry out a risk assessment based on the documentation.

[863] At the same time, the importer or the customs agent will usually apply for a Biosecurity Authority Clearance Certificate (BACC) so that the good can be cleared at the border from the transitional facility it is kept at upon arrival. This part of the process is also typically completed by the customs agent or the freight forwarder. An application for a BACC can be lodged via MAF's electronic Biosecurity Authority Clearance Certificate application (EBACCA) system or by completing and returning the appropriate physical form to MAF.

[864] In June 2009 the EBACCA system had just been rolled out.⁴⁶⁹ Fiona Willmot was the manager of Ms Edel-Singh, the Target Evaluator who cleared the June 2009 anthers consignment relevant to this case. Mrs Willmot described the system as a virtual queue where each time an application is lodged on EBACCA it gets added to the queue of applications to be assessed by the Target Evaluation team. Evidence from witnesses involved in the clearance process said that BACC applications typically contained the following documents: an air waybill or bill of lading; manifest; invoices; certification of treatment or other offshore assurances; and import permits (if one was required).

Target Evaluation

[865] Once the application reaches the top of a queue, it undergoes what is known as Target Evaluation. This is a process where MAF assesses the documentation that has been provided and makes sure it matches to an IHS that allows for the clearance of the good being imported. This process places a significant level of trust and confidence in the certification, declarations or other documented information that accompanies a consignment. It is demonstrative of the reliance that New Zealand's biosecurity regime places on the pre-border stage of the system.

[866] The first task for the Target Evaluator is to match the good to the appropriate IHS. This sets out the requirements that must be met before a risk good can be imported into New Zealand.⁴⁷⁰ There is standardised information in all IHSs to make the process of Target Evaluation easier. Matching the good to the appropriate IHS can be done by memory or by searching keywords on a MAF database. Some searches will return several IHSs and will require the Target Evaluator to look at each standard and decide which is the most appropriate based on the titles of the IHSs and the eligibility information in them.

[867] The Target Evaluator will then skim read through the IHS document to find the entry requirements for the import in question. Mrs Willmot stated that Target

⁴⁶⁹ It is now estimated that approximately 90 per cent of applications are received through the EBACCA system.

⁴⁷⁰ At the time of the hearing there were 339 IHSs which ranged from being five pages to 80 pages in length.

Evaluators do not read through the whole IHS because only the entry requirements are relevant to their task and also because of the overall scale of their work. Entry requirements are conditions such as how the product should be packaged, treated or any information or documentation that must accompany it. They might also specify what should happen with the goods once they arrive in New Zealand.

[868] The Nursery Stock IHS, which covers pollen and anthers, sets out two different types of conditions: basic conditions which apply to minimal risk goods; and special conditions which apply to higher risk goods on top of the basic conditions. For nursery stock, the Target Evaluator can search the Plants Biosecurity Index to find out whether the good being imported needs to meet basic or special conditions. This is then cross-referenced with the schedule in the relevant IHS to determine what the entry requirements are and whether basic or special conditions apply.

[869] Cargo may require an import permit in addition to the IHS requirements. All types of goods that require a permit will also have a corresponding IHS. The Target Evaluator will need to consult this as well and ensure that the cargo is compliant with both the permit and the IHS. There is a database called IMPACT which gives information on whether a permit is current.

[870] Target Evaluation as a process is about assessing the documentation accompanying a consignment against the relevant IHS and/or permit. Government-issued documentation is certified as agreed between MAF and the exporting country's equivalent government department. This means Target Evaluators tend to accept them unless the copy is poor or there are reasons to have doubts about the official stamps and signatures. Problems are more likely to be found in the process of Target Evaluation with the documentation provided by the importer or their agent. These issues are categorised by the Target Evaluation team into either a non-technical non-compliance or a technical non-compliance. Non-technical non-compliance covers typographical errors or a slightly different quantity involved, or a different exporter named on different documents. A technical non-compliance is where a document does not actually meet the requirements of the IHS and/or permit.

[871] Target Evaluators take different approaches to the way non-technical non-compliances are dealt with. Some are “fairly black and white” in that they treat them as a technical non-compliance, whereas others will allow some latitude. Mrs Willmot explained that best practice is for non-technical non-compliance issues to be raised with a Team Leader or Technical Advisor since they have some ability to allow acceptance of non-technical issues. There are also pre-defined procedures for certain non-technical issues that arise regularly (for example, thermograph deviations).⁴⁷¹ Discretion is usually exercised on the side of caution by requiring re-treatment or holding the consignment at a transitional facility until the correct documentation is re-issued with the right information.

[872] Where there is a technical non-compliance, the Target Evaluator can either send a non-compliance report (NCR) to the relevant standards team, request a re-issue of the relevant document from the importer or their agent, or give the importer the option of re-shipping the goods or having them destroyed.

[873] Once an NCR is sent to the standards team, the standards team provides advice on what should happen. The Target Evaluator is required to complete a form stating information such as the name of the importer, country of origin, certificate details and what they have identified as an error (for example, misleading additional declaration). QuanCargo allows the relevant import standards team to then check the documentation. An adviser in the import standards team then provides advice back to the Target Evaluator on how to proceed and what BACC direction to issue. The adviser cannot issue BACC directions under the Act. There are additional procedures which escalate issues to the supervisor level in case the Target Evaluator disagrees with an adviser. Mrs Willmot noted that this has happened rarely in her 18-year career at MAF.

[874] In other situations, a Target Evaluator will request a re-issue of certain relevant documentation. Alternatively, they might ask the relevant import standards team about

⁴⁷¹ These record cold treatment conducted while a vessel is en route to New Zealand. This is important for products that must remain at a constant temperature during their journey to New Zealand. The temperature that the container is set at and the time spent in transit can effectively function as a treatment method. Depending on the extent of variation, a Target Evaluation Team Leader has the authority to make a decision on the outcome instead of sending all the paperwork to the relevant standards team for advice.

whether the declarations or documentation actually provided can be considered to be equivalent to the IHS. It largely depends on the degree of non-compliance as to which approach is taken. After a document is re-issued, Target Evaluators tend to take the new documents at face value unless the documents are still incorrect in which case the Target Evaluator will ask for an explanation. Since sanitary certificates are issued by foreign government departments, Target Evaluators have a good degree of confidence in them. However, a more cautious approach is taken with manufacturer's declarations and treatment certificates since these do not carry the same official status.

[875] Where there is a delay in getting an original of a document or a reissue has been requested, a dispensation may be given by Team Leaders or a Chief Quarantine Inspector in rare circumstances. Dispensation is where the consignment is sent for inspection on the basis that the right or original documentation will be provided later. It is granted so that things are not held up while waiting on the documentation and the consignment is released until the documents are actually provided. Mrs Willmot gave the example of goods coming in from the Pitcairn Islands as being a situation where dispensation might be granted since boats from there only arrive every three months or so. If no inspection is needed then it might be released to the importer or their agent on rare occasions.

[876] Where the technical non-compliance is of a nature that cannot be treated or fixed by further documentation the importer is contacted about whether they want to have the import re-shipped or destroyed.

[877] Mrs Willmot recalls an occasional practice of re-issuing a new import permit to manage document non-compliance. That happened in situations where the standards team was satisfied that a new permit should be issued in the circumstances because the consignment met the requirements of the IHS. This is now dealt with under s 27 of the Act through directions signed-off by the Chief Technical Officer following the amendment of the Act in 2012.

[878] Once the import documents have been assessed, the Target Evaluator issues a BACC direction. The type of direction that is issued at the end of the Target Evaluation process largely depends on the IHS or permit that applies. The various directions that

can be made include: holding cargo until original or further documentation is provided; releasing cargo; inspection; treatment; and seeking direction from a Chief Technical Officer as to whether to offer the importer with reshipment or destruction of the cargo. A consignment might have several directions attached to it at the end of Target Evaluation. If the BACC is for an inspection, then further BACC directions might be needed from the Quarantine Inspector before a release direction is granted.

[879] In deciding whether to issue an inspection BACC, the Target Evaluator is primarily concerned with making sure that the biosecurity risk is covered as set out by the entry requirements for that consignment's relevant IHS or permit. A Quarantine Inspector does the inspection since the Target Evaluator only deals with risk profiling on the documentation. The BACC does not describe how to inspect, that is to be determined from the training and operational information available to the Quarantine Inspector.

[880] Generally speaking, Quarantine Inspectors do not carry out inspections unless directed to do so by an inspection BACC given by a Target Evaluator. However in June 2009, the Quarantine Inspectors at the Auckland International Airport would receive some BACC applications or relevant documentation directly and would therefore be carrying out Target Evaluation tasks such as deciding whether to inspect.

[881] Mrs Willmot explained that a Target Evaluator would issue an inspection direction where the IHS, import permit or Process Procedures required it. Process Procedures are essentially an expansion of the IHS which describe in greater detail how the IHS is to be applied. There is an inspection tab on QuanCargo which is normally filled in by the Quarantine Inspector once they have inspected it stating the degree of inspection carried out (for example, whether the whole consignment was checked or just the packaging).

[882] Mrs Willmot explained that Target Evaluators do not send each and every consignment for inspection. The whole purpose of Target Evaluation is to minimise the number of consignments that have to be scrutinised by inspection so that the higher

risk goods can be inspected. Inspecting low risk items takes away from time that could be spent on high risk items.⁴⁷²

[883] The direction is typed into QuanCargo and this generates a BACC with the direction on it. The BACC is emailed to the importer or agent who made the EBACCA application. All of this is saved on to QuanCargo. This concludes the Target Evaluation stage.

[884] The scale of the task for the Target Evaluation team is significant given the nature of the process described above and the volumes of goods being imported in to the country every year. In the 2009/2010 financial year approximately 138,800 BACC applications were received by the team.⁴⁷³ Approximately 53,000 of these were for air cargo. Currently there are an average of about 600 BACC applications per day. This is more than in 2009/2010 but Mrs Willmot considered this to be indicative of the kind of volume being processed by the Target Evaluation team.⁴⁷⁴ Mrs Willmot explained that it takes roughly 10 to 13 minutes to process an application on average, but there are high complexity applications which can take hours or need peer review.⁴⁷⁵ Target Evaluators have a number of other tasks as well.⁴⁷⁶

[885] There is a process of quality control on the Target Evaluation process which existed in June 2009. At least 16 random consignments were checked monthly to ensure the correct decision was made, correct data entry completed, all charging was

⁴⁷² They have to rely on the accuracy of exporter and importer declarations to some extent. There is a regime of audits and surveys to ensure that importers and their agents are providing accurate declarations. There are also large fines, potential prison time and loss of licence to import as deterrents used in the strict enforcement regime for ensuring compliance and accuracy of declarations.

⁴⁷³ In the 2015/2016 financial year the number had increased to 210,000 BACC applications.

⁴⁷⁴ The Target Evaluation teams have target turnaround times referred to as Service Level Agreements (SLAs) which came in on July 2009 (that is, after the consignment at issue) which require that Target Evaluation be completed within three business hours of receiving an EBACCA application for air cargo and six business hours for sea cargo. These turnaround times were to be met for 80 per cent of EBACCA applications processed by a Target Evaluator.

⁴⁷⁵ This is consistent with Ms Giselle Edel-Singh's evidence (discussed further below) about the June 2009 anthers consignment that the first 15 minutes of processing an application at the Target Evaluation stage is covered by a levy on importers but that any time spent over and above this initial 15 minutes will incur further fees.

⁴⁷⁶ For example, dealing with phone calls, email queries, personal effects clearances, vehicle clearances, what are termed second submissions, staffing the public counter used by importers and customs brokers to drop off documents, and dealing with the risk profiling of specialty consignments.

correct and that the BACC was sent to all appropriate parties. The amount of checking was increased in January 2017 to one per cent of all applications processed by each Target Evaluator per month.

Arrival in New Zealand

[886] Generally, after an import good is dealt with at the Target Evaluation stage, the next time it is dealt with by MAF is upon arrival in New Zealand. Cargo enters New Zealand by air or sea. The bulk of inbound cargo arrives by sea because it is a cheaper form of import. In this case, the June 2009 anthers consignment arrived by air freight. Most of New Zealand's air freight processing is conducted by Air New Zealand or Menzies Aviation regardless of the airline in which the cargo arrives. These companies manage the logistics to move the cargo from the plane to their transitional facility approved under the Act.⁴⁷⁷

[887] After unloading, air freight is taken to a transitional facility. At Auckland International Airport, where the events relevant to this case took place, they are taken to the Air New Zealand Cargo compound where MAF had an office and transitional facility. This facility had a public counter, desks with computers, inspection rooms and offices for managers. Cargo arrives in an air container which are either enclosed containers with a door or flap for entry or a flat deck metal pallet. Containers are categorised as either consolidation containers, put together by the airline and composed of numerous small consignments for different importers, or containers put together by a single importer or freight forwarder. The latter would normally be picked up by the freight forwarder and taken to their own transitional facility. Cargo arriving in planes owned or operated by other airlines would also be brought to Air New Zealand's compound.

[888] The consignments that are unloaded at the compound went into coded shelves so they could be tracked within the facility. The compound contained a chiller and freezer for consignments which required such treatment. Whether this was required

⁴⁷⁷ Express freight, such as courier mail, arrives at an express freight transitional facility and is processed by the express freight company that acts as an agent and submits applications to Customs Services and MAF in the same way. For example, FedEx is a well-known express freight company which also operates its own transitional facility under the Act.

could be determined from the air waybill accompanying the consignment. Air waybills contain the shipper's name and address, the consignee's name and address, airport origins and destination codes, the declared value of the shipment for customs, number of pieces, gross weight, a description of the goods and any special instructions. They also contain the conditions of carriage.

[889] The MAF personnel who usually deal with the import goods after Target Evaluators are Quarantine Inspectors. They are appointed under the Biosecurity Act to assess, manage and give clearance to imported goods. They deal with unaccompanied cargo and mail as well as goods carried across the border by passengers on international flights. They do their job at international airports, international mail centres, ports and transitional facilities. They undertake training which includes training on specific types of goods and on how to use the QuanCargo system. There is on-the-job training and trainees cannot independently clear consignments without the final approval of a more senior inspector. David Hodges, the Quarantine Inspector who cleared the impugned June 2009 consignment, said that it takes approximately six months before a Quarantine Inspector can carry out clearances independently. This is when they receive their QuanCargo login. They also have ongoing annual competency tests where they are examined against the requirements set out in the IHS and required to demonstrate that they can find the correct information needed for granting clearance. There are also random reviews of each Quarantine Inspector's work.

[890] Upon arrival, Air New Zealand cargo staff would give MAF personnel a packet of documents that related to the goods carried in the flight. The Quarantine Inspection team would review this packet and stamp a MAF authorised hold on any air waybills that likely posed a biosecurity risk. This represents very initial risk profiling which would communicate to Air New Zealand that they cannot release consignments without a BACC being presented by the importer or their customs agent.

[891] Applications for a release BACC would normally take place in the way described above, but in June 2009 the MAF air cargo team at the Auckland International Airport also received email and fax applications from time to time meaning that they would need to undertake Target Evaluation themselves. As a result

of this, the process for clearance described by Mr Hodges from a Quarantine Inspector perspective was roughly similar to that which was given in evidence by those in Target Evaluation roles. Mr Hodges explained that most of his decision-making about what to do with the documents presented and deciding whether to inspect were technically Target Evaluator tasks but that it was a part of his job at Auckland Air Cargo.⁴⁷⁸

[892] In summary, Mr Hodges said that the process of clearance from his perspective would be to: assess the documentation provided by the importer against the relevant IHS (checking in particular the entry conditions); checking the import permit if there was one; checking the Process Procedures if there was any uncertainty with the IHS; checking the sanitary certificate if one was required; and checking the invoice accompanying the product for the quantity and weight listed against the one on the air waybill. If not all the relevant documentation was on QuanCargo or the consignment then a hold BACC direction would be issued until these were received.

[893] Even where an inspection direction had not been issued at the Target Evaluation stage, the Quarantine Inspector has a decision as to whether they visually inspect a consignment. Certain pathways are cleared on the paperwork alone by Target Evaluators (or Quarantine Inspectors acting as Target Evaluators) while others need inspection. Inspection can be of the actual product or the packaging it comes in. In making this decision, it is necessary to consider the IHS, any permit and Process Procedures. Mr Hodges said that one of the considerations entering into the exercise of this discretion was the possibility of causing damage to consignments as a result of inspection (for example, cutting into a bag of milk powder to inspect might destroy the product completely). Other considerations include looking or feeling the package without opening it to determine its content, checking any information on the packaging, and assessing the credibility of documents accompanying it.

[894] There were also additional guidelines for inspecting frozen products. Mr Hodges said that frozen plants were uncommon because the freezing would normally kill the plants. If something came in under a frozen standard then the cargo team would verify that the product was still actually frozen. This was where, under the

⁴⁷⁸ This was different to what Metro Inspectors (sea freight inspectors) did, in that they only stepped in to inspect once a Target Evaluator had issued an inspection BACC.

frozen products pathway, the product must be frozen as a treatment for pests, or where it was not from a commercial pathway and its frozen status might be in question. Inspecting a frozen package for verification purposes meant inspecting the packaging to make sure it was intact and that there were no leaks. The packaging was not opened unless it was to verify what it was.

[895] Inspection could be a time-consuming task and could take anywhere between 15 minutes to an hour (inclusive of Target Evaluation time where this was part of the Quarantine Inspector's role at Auckland Air Cargo in 2009). There were some time pressures from the importer wanting clearance because they wanted to avoid paying demurrage fees. These fees begin accruing after a consignment or package or container was held at the compound for 24 hours. In general, the compound was not a long-term storage facility and Air New Zealand continually had more cargo arriving so that there was pressure to move consignments along. However, Mr Hodges explained that while Quarantine Inspectors had to keep these time pressures in mind, they certainly could not clear something just because people were in a hurry.

Across-the-border passage of the June 2009 consignment

The application for biosecurity clearance

[896] The passage of the particular consignment at issue in this case was that Kiwi Pollen's import agent and freight forwarder, International Cargo Express, lodged an EBACCA application for biosecurity clearance on 23 June 2009. This application described the consignment as carrying "kiwifruit pollen" and attached three documents in one PDF file. These documents were an air waybill for "kiwi pollen", a commercial invoice for "kiwi pollen" and a MAF import permit for "frozen kiwifruit pollen". Once lodged, this application would have been added to the queue of applications on EBACCA awaiting risk assessment from a Target Evaluator working at the Auckland Biosecurity Centre.

Target Evaluation

[897] The application was first viewed by Ms Edel-Singh on 23 June 2009.⁴⁷⁹ She does not recall dealing with the June 2009 anthers consignment. Her evidence is based on the QuanCargo records which detail when actions were taken on the application for clearance at the Target Evaluation stage.

[898] The QuanCargo system shows that Ms Edel-Singh was the first person to view the EBACCA application lodged by International Cargo Express. She does not recall what she thought of that customs broker at the time but she continues to deal with them on an ongoing basis and has not experienced them to cause any issues intentionally. Ms Edel-Singh's first action was to generate a consignment number on QuanCargo (consignment number 2009/140782) on 23 June 2009. She then noted that the consignment was due to arrive the following day on 24 June 2009. She then reviewed the import permit that International Cargo Express had provided and saw that the consignment needed to be accompanied by a phytosanitary certificate with a specific declaration. She noted that none had been provided by the customs broker and so she issued and signed a BACC direction holding the consignment awaiting presentation of the phytosanitary certificate. This BACC direction was emailed to International Cargo Express.

[899] Ms Edel-Singh then entered a charge of \$22.22 in the "Charge" tab on QuanCargo for "Admin associated with physical insp". She explained that the initial risk profiling carried out at the Target Evaluation stage was covered by a biosecurity levy collected by Customs, but this levy only covered 15 minutes of the risk profiling undertaken. There were additional charges where Target Evaluation took longer than 15 minutes of processing time or if there were multiple interactions with the consignment application. This was the case here because someone from MAF would need to deal with the consignment application again in order to process it. A phytosanitary certificate still needed to be provided and the whole application

⁴⁷⁹ Ms Edel-Singh graduated with a Bachelor of Science in biology and statistics in 2006 and had been working for MAF since 2007. She started out as a Metro Inspector based in Auckland for the first year of her employment. She then became a Target Evaluator and had continued in that role for almost a decade at the time she filed her brief of evidence. QuanCargo records show that in 2009 she issued approximately 11,400 BACC directions at an average of approximately 900 per month.

evaluated again on the basis of this further documentation. Ms Edel-Singh's entry of this charge was therefore in anticipation of someone else at MAF interacting with the application again once the certificate was received. Ms Edel-Singh accepted that the description provided for the charge was not accurate. She could not have possibly inspected the consignment since it had not even arrived in New Zealand when the charge was created. She explained that this inaccuracy was because QuanCargo offered a limited list of description codes to choose from for charging purposes. This charge was not emailed out to International Cargo Express at this time because there might have been further charges before the clearance application for the consignment was finally resolved.

[900] Ms Edel-Singh's evidence about the nature of the charge was supported by Mrs Willmot. She said the code for the charge was "282" and this was the same code Mrs Willmot used when she dealt with a consignment of kiwifruit pollen in January 2009. That code was used by her because she had requested more paperwork. The invoice she sent for that consignment described the charge as "office admin" (as the descriptions associated with the code could change in the system at this stage).

[901] On 24 June 2009, Ms Edel-Singh received an email from International Cargo Express stating that the shipment had arrived and that the sub air waybill had been cancelled since the consignment had arrived by itself and not in a consolidation container with other consignments (sub air waybills are required for consolidations whereas master air waybills are required for consignments arriving on its own). This is the last time Ms Edel-Singh had anything to do with the consignment at issue in this case.

[902] Ms Edel-Singh did not issue a BACC directing the consignment be inspected. She does not remember precisely why that was. However she said that in deciding not to issue an inspection direction, she would have considered the import permit, the relevant Nursery Stock IHS and Process Procedures (which Ms Edel-Singh said was useful for figuring out what to do with "obscure consignments"). She considered that inspection was not specifically mentioned in the permit, the IHS and the Process Procedures for the type of good that was being imported in the consignment. She also

said that she did not have all the documents necessary to issue a direction other than a hold BACC direction. Mrs Willmot agreed with this view.

[903] It is not known where International Cargo Express presented the phytosanitary certificate. It could have been presented at the public counter at the Auckland Biosecurity Centre where Ms Edel-Singh worked or the public counter at the Auckland Air Cargo compound where the consignment was kept upon arrival. Ms Edel-Singh said that the latter situation was more likely because the “Docs” section of the QuanCargo records say that the phytosanitary certificate was held there. In any case, she does not recall ever viewing the certificate she issued a request for pursuant to the hold BACC direction she had made.

[904] Mrs Willmot agreed with Ms Edel-Singh’s evidence that, because the phytosanitary certificate was missing, she did not have enough information to make a full evaluation about whether to direct an inspection. She explained that when missing information is provided, the application goes back into the queue. Target Evaluators work on whichever matter has come to the top of the queue. This means that whoever first evaluated the application may not be the person who evaluates it again when the missing information arrives. Each person has to take responsibility for making sure the next part of the evaluation is done properly. In this case, the missing information likely arrived at Air Cargo, which meant it did not come back to Target Evaluation for review. It was then for the Quarantine Inspector to assess what needed to be done. This no longer happens because it is now all centralised.

Border clearance at Auckland Air Cargo

[905] Consignment number 2009/140782 arrived at the Auckland International Airport on 24 June 2009. It was taken to the Air New Zealand Air Cargo compound. MAF’s records show that in 2009 the team at Auckland Air Cargo processed 10,653 air cargo consignments with 940 of those being in June. The consignment was held at this compound pending presentation of the phytosanitary certificate requested during the Target Evaluation stage. This certificate was put on a courier to Auckland two days later on 26 June 2009. This suggests that the certificate was presented to the public counter at Auckland Air Cargo.

[906] The consignment was dealt with by Mr Hodges, who had been appointed under the Act.⁴⁸⁰ Mr Hodges does not have any specific memory of granting border clearance to the particular consignment at issue in this case. He does not recall clearing any pollen. His evidence, like Ms Edel-Singh's, was given based on QuanCargo records which show the precise times he took actions in relation to the clearance process of this consignment.

[907] The QuanCargo records show that his first interaction with the consignment was on 30 June 2009. Mr Hodges does not remember whether someone had come and presented him with the original hardcopy phytosanitary certificate or whether he had retrieved it from the actual package. MAF has not been able to find the hardcopy of the original phytosanitary certificate. Mr Hodges explained that his usual practice, when he had finished clearing a consignment which had a phytosanitary certificate, was to handwrite the consignment number on top of the hardcopy certificate and then file it. In June 2009, the Auckland Air Cargo team had a hardcopy-only physical filing system since it was one of the last offices to get scanners. These hardcopies would be stored in a cabinet which would then be emptied into storage once it was full.

[908] Mr Hodges said his practice was to only fill out the details for a phytosanitary certificate on QuanCargo if he had received a certificate which he was satisfied was an original. He had done this and ticked the box titled "received". He said that it was highly unlikely he would have done this if he had not seen the hardcopy certificate which he thought was an original. The phytosanitary certificate number he entered into QuanCargo exactly matched the electronic copy of the certificate later provided to MAF by International Cargo Express in 2012 (as a part of a request under the Official Information Act 1982). Mr Hodges cannot think of any way he would have been able to record that number without seeing the hardcopy certificate.

⁴⁸⁰ Mr Hodges graduated with a Bachelor of Science in Horticulture and a Diploma in Horticulture from Massey University in 2003 and began working for MAF in 2002. Mr Hodges was a Quarantine Inspector until 2013 in the Auckland Air Cargo team. During this time, he also worked in Japan as a Quarantine Inspector for MAF conducting pre-clearance inspection of cars being exported to New Zealand. QuanCargo records show that in the eight months of 2009 that he worked at the Auckland Air Cargo team he issued approximately 664 consignments (he was away in Japan for the other four months of the year). On top of processing applications for clearance, Mr Hodges was involved in screening flight manifests as they arrived, inspecting live animals and private personal effects, screening courier manifests for express freight firms, and assisting other inspectors with inspections.

[909] The records show that Mr Hodges entered these certificate details onto QuanCargo at 10.41 am on 30 June 2009. His next action was to enter a release BACC direction seven minutes later at 10.48 am. Finally, he emailed International Cargo Express the invoice for the consignment at 10.48 am. This was the \$22.22 charge Ms Edel-Singh had originally entered for to the clearance application.

[910] Mr Hodges does not remember whether he inspected consignment 2009/140782. However, he thinks it is unlikely that he inspected it. His usual practice was to enter the details of any physical inspection (either the packaging or the actual goods) in the inspection section of the QuanCargo record. The inspection tab was left empty. Moreover, his usual practice was to enter the phytosanitary certificate details into QuanCargo and then check everything complied with the IHS and permit, and then carry out an inspection if he was directed to do so or if he had determined that it was necessary. Such an inspection would require him to go into the warehouse part of the compound, find the package, open it, look at the product, reseal the package, return it to its original location in the warehouse and then return to the office part of the compound. He considered that this could not have been done in the seven minutes between the entry of the certificate details and the entry of release BACC direction at 10.48 am. Mr Hodges said that all of this would have taken at least twice that amount of time and incurred an additional charge that he would have added to the one added by Ms Edel-Singh. For these reasons, and because he could not remember or visualise what the consignment looked like, he considered it was unlikely that he inspected the consignment.

[911] While Mr Hodges does not recall the actual reasons he had for not inspecting the consignment, he considered there were a number of reasons why he would not have done so. These were:

- (a) there was nothing in the pollen section of the IHS or on the permit requiring inspection;
- (b) there was nothing he could usefully inspect since it was a consignment of frozen pollen;

- (c) frozen products were associated with lower risk;
- (d) cargo on a commercial pathway was associated with lower risk; and
- (e) there was a risk of damaging the product by cutting into it and also a risk of not being able to properly reseal the package after inspecting it.

[912] Mr Hodges said that, had he opened the package and inspected its contents, he would have been able to differentiate between anthers and pollen because of his horticultural background.

[913] Upon retrospectively reviewing the phytosanitary certificate and assessing it against the import permit and the air waybill, Mr Hodges recognised that there were some discrepancies. These discrepancies were as between the weight listed on the certificate and the air waybill, the exporter's name on the permit and the certificate, and the species name listed in the certificate and the permit. Mr Hodges said that he would not have been concerned about the weight difference because it could have been attributed to packaging. This is quite common in frozen products which have ice packs in the package. He explained that his normal practice regarding the discrepancy in exporter details and the species would have been to issue a non-compliance report to the relevant import standards team and issue a hold direction until this had been resolved. However, he evidently did not do this here and proceeded to give clearance to the consignment. In cross examination, he was referred to s 27 of the Act which lists situations where an inspector may not give clearance. He accepted s 27 provides that an inspector may not give clearance where there are discrepancies in the documentation which make it unwise to give clearance. He also agreed with Mrs Willmot's evidence that the difference in species name should have led to the issuance of an NCR and that this was compounded by the difference in export name as well.

[914] The release BACC was then printed at 4.20 pm on 30 June 2009. The fact that it was printed later in the day indicates that someone from International Cargo Express came to the compound to collect the consignment and wanted a hard copy of the BACC to give to Air New Zealand staff. Alternatively, the consignment could have

been picked up in the morning but someone from International Cargo Express may have asked for the BACC print-out later in the day. This record is important for the party which has made the clearance application because they can be audited by MAF. The QuanCargo records show that Mr Hodges was the person who printed this release BACC. This is surprising because his shift on 30 June 2009 finished at 3 pm and, while it was not unusual for him to stay an extra 30 minutes or so to finish off a task, it would be unusual for him to still be there at 4.20 pm. Mr Hodges considered it was possible he had forgotten to log out of QuanCargo and someone else had printed the release because someone had come to request it at the counter.

[915] In any case, this represents his last interaction with the consignment at issue other than to issue an invoice.⁴⁸¹ He emailed the charge which had been entered by Ms Edel-Singh. He considered this to be a normal charge if it took the Target Evaluator more than 15 minutes to enter and check the details of the consignment via the paper work presented.

The June 2009 consignment's journey to Kiwi Pollen's premises

[916] Having been cleared by Mr Hodges on 30 June 2009 and released to International Cargo Express, the consignment was taken to Kiwi Pollen's premises at Main Road in Te Puke. There it was received by Jill Hamlyn, the managing director of Kiwi Pollen. What then happened to the contents of the consignment is discussed in "Part 6: Causation".

[917] For present purposes, I note the evidence is that the consignment contents were packed in an unsophisticated manner and it contained anthers which Ms Hamlyn cycloned into pollen. Ms Hamlyn reviewed the phytosanitary certificate before preparing her brief of evidence and noticed that the species listed there was not *Actinidia deliciosa* as listed on the import permit. She believes the anthers that she received were *Actinidia deliciosa* anthers because *Actinidia arguta* anthers are

⁴⁸¹ QuanCargo records that he printed the release BACC he had granted in June 2009 again on 26 January 2012. This was because he had just discovered that a consignment of kiwifruit pollen he had granted biosecurity clearance to was being reviewed as a part of a response to Psa. He was interested to see what the QuanCargo records said in relation to this.

markedly smaller and she would have noticed this. She is sure that the anthers received were kiwifruit anthers.

Was there an inspection of the contents of the June 2009 consignment

Submissions

[918] There is no dispute that Ms Edel-Singh was the Target Evaluator for the June 2009 anthers consignment and Mr Hodges was the Quarantine Inspector who issued the clearance. The records show this. A factual issue for determination is whether Mr Hodges carried out a visual inspection of the contents of the consignment.

[919] The plaintiffs submit that Mr Hodges may have inspected the contents of the consignment. They submit that, if he did, he was negligent because he ought to have realised that the permit was for pollen and the consignment contained anthers. The defendant submits the evidence shows he did not inspect the contents of the consignment.

Assessment of the facts

[920] I consider it is more likely than not that visual inspection did not actually take place. There is reliable evidence that it did not take place and, in contrast, there is no reliable evidence indicating that it did. Mr Hodges does not believe he undertook an inspection. The confusion caused by the narration for the inspection charge has been adequately explained.

[921] The evidence indicating there was no visual inspection, in summary, is as follows:

- (a) Mr Hodges said his usual practice was to fill out the inspection tab on the QuanCargo record of the consignment when he had actually carried out inspection. This would detail the extent of the inspection (that is, packaging-only or full inspection) and whether he found anything out of the ordinary. There was nothing in that tab for the consignment in issue indicating that no inspection took place.

- (b) Mr Hodges said his usual practice was to enter the phytosanitary certificate information and details of other accompanying documentation on to QuanCargo before carrying out an inspection (if one was needed) and then issue whatever BACC direction was appropriate. Here there was only seven minutes between the entry of the phytosanitary certificate details and the issuance of the BACC release direction. It is almost impossible that he could have carried out all the tasks required for inspection in that timeframe. Mr Hodges said that it would have taken at least double the amount of time available. This indicates there was no inspection.
- (c) Ms Edel-Singh issued a charge at the Target Evaluation stage. This was not for an inspection, which had not occurred. There was no additional charge added to Ms Edel-Singh's charge once the consignment went to a Quarantine Inspector (in this case, Mr Hodges). If an inspection had taken place it would have taken a further 15-20 minutes at least, and led to the addition of a further charge to the invoice.
- (d) Mr Hodges has no recollection of the consignment and cannot visualise its contents.
- (e) Mr Hodges has provided a number of plausible reasons why he would not have inspected the consignment.

[922] Mr Hodges said the incursion was a major event for MAF. He was aware the anthers consignment was suspected of having caused the outbreak. He had checked the records and so was aware that he was the officer who had cleared the consignment. He was expecting to be asked about it at some stage. However that did not happen. He did not discuss it with his supervisors. He said he waited for someone to ask him about it, rather than thinking it about it more, because "the more you think of something the worse it gets".

[923] Mr Hodges' memory was tested in cross-examination and the plaintiffs sought to have him envisage the possibility that he did conduct an inspection. He was asked

to consider whether he had derogated from his usual practice of entering the phytosanitary certificate first, and whether he might have gone to collect the phytosanitary certificate from the consignment and conducted an inspection while there before returning to enter the details on QuanCargo. However Mr Hodges had no recollection of these possibilities and considered them to be highly unlikely.

Was an inspection of the contents of the June 2009 consignment required?

[924] I have found that Mr Hodges did not visually inspect the contents of the June 2009 anthers consignment. This means the plaintiffs must prove that the consignment should have been inspected such that the decision not to inspect fell below the standard of care owed to the plaintiffs.

The statutory and regulatory framework

The Biosecurity Act

[925] The relevant statutory provision concerning an clearance at the border is s 27 of the Act. At the relevant time, this section stated:

27 Inspector to be satisfied of certain matters

An inspector shall not give a biosecurity clearance for any goods unless satisfied that the goods are not risk goods; or satisfied—

- (a) That the goods comply with the requirements specified in an import health standard in force for the goods (or goods of the kind or description to which the goods belong); and
- (b) That there are no discrepancies in the documentation accompanying the goods (or between that documentation and those goods) that suggest that it may be unwise to rely on that documentation; and
- (c) In the case of an organism, that the goods display no symptoms that may be a consequence of harbouring unwanted organisms; and
- (d) That the goods display no signs of harbouring organisms that may be unwanted organisms; and
- (e) There has been no recent change in circumstances, or in the state of knowledge, that makes it unwise to issue a clearance.

The Nursery Stock IHS

[926] The Nursery Stock IHS was divided into three parts:

- (a) Part one: an Introduction section, including definitions and abbreviations;
- (b) Part two: a section on Import Specification and Entry Conditions; and
- (c) Part three: a section containing the Schedules of Special Entry Conditions (the schedules comprise the bulk of the document).

[927] Part one provided a definition of “nursery stock” as follows:

Nursery Stock: Whole plants or parts of plants imported for growing purposes, e.g. cuttings, scions, budwood, marcots, off-shoots, root divisions, bulbs, corms, tubers, rhizomes, and plants *in vitro*.

[928] It also provided a definition of “unit”:

The basic element selected for sampling. For nursery stock this unit may be a plant, bulb or cutting. For tissue cultures it is the vessel containing the cultures.

[929] Part two commences with the following:

2.1 INSPECTION ON ARRIVAL AND MAXIMUM PEST LIMIT

A randomly drawn sample of 600 units, from each homogenous lot within in a consignment, shall be inspected on arrival. Where a lot is comprised of less than 600 units, 100% inspection is required.

Infestation by visually detectable quarantine pests on inspection at the border must not exceed the Maximum Pest Limit (MPL) which is currently set at 0.5%. To achieve a 95% level of confidence that the MPL will not be exceeded, no infested units are permitted in a randomly drawn sample of 600 units (i.e. acceptance number = 0).

[930] Part two then states that all imported nursery stock must comply with the basic conditions outlined in sections 2.2.1 and 2.2.2, and with any relevant special conditions in the Schedules. The basic conditions outlined in section 2.2.1 begin:

Nursery stock requiring only basic entry conditions may be imported in any of the following types, as:

- Cuttings (dormant and/or non-dormant)
- Whole Plants
- Dormant Bulbs and Tubers
- Tissue Culture (see section 2.2.2)

[931] After the basic conditions outlined in 2.2.1, there are then entry conditions for tissue culture in 2.2.2.

[932] Next is 2.2.3 which provides:

2.2.3 IMPORTATION OF POLLEN

An import permit must be obtained from MAFBNZ prior to import.

[933] This clause is the only mention of pollen in the entire document.

MAF's Process Procedures

[934] MAF also had a process procedure for “clearance of plants and plant products” which at the relevant time was Process Procedure 41. This was a 70 page document. It included a definition section. The definitions included an identical definition of “nursery stock” to that in the Nursery Stock IHS. It also included a definition of “inspection” as follows:

Official examination of plants, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations [FAO, 1990; revised FAO, 1995; formerly inspect].

Also refer to sampling plan / inspection sample size shown in Appendix 1.

Note: For MAFQS inspection covers all actions required to achieve biosecurity clearance. It therefore includes visual examination of certification and / or the goods in a consignments and any cage, conveyance, packaging or other thing that has been in direct contact with that consignment, by an inspector appointed under BSA section 103.

[935] Clause 6.1 provided that:

As an inspector, appointed and warranted under the Biosecurity Act (1993), you are responsible for ensuring that all the activities in this procedure are carried out.

[936] Clause 7.1 was headed “Assessment of Uncleared Goods”. This included the following:

Assessment of uncleared goods to decide if they are risk goods can be made using any of the following methods:

- Examination of import documentation.
- Inspection of the goods if they are unknown to you. (Refer 7.3.2)
- Questioning the importer about the goods.
- Reference to appropriate IHS.
- Reference to appendices within this procedure, which cover both risk and non-risk products.

[937] Clause 7.1.3 set out the requirements of IHSs. This included the following provisions:

7.1.3.1 Goods being imported which are specified in an IHS must meet the requirements of that IHS.

7.1.3.2 If an IHS requires an importer to have a Permit to Import (PTI) for their goods, you must receive the PTI as part of the risk assessment and documentation check which you perform.

- The conditions of a valid PTI are in addition to the requirements of an IHS, **not instead of** the IHS requirements. If PTI conditions contradict the relevant IHS then a non-compliance report must be sent to the Senior Adviser- Border Standards (SA-BS).
- The importer or their agent is responsible for obtaining and providing the PTI.
- Where the importer is unable to produce a valid PTI, then refer to section 7.9 of this procedure.

[938] Clause 7.2 set out provisions concerning inspecting documents for compliance with the Act.

[939] Clause 7.3 was concerned with “inspection requirements”. This included the following:

7.3.2 Goods requiring physical inspection

7.3.2.1 You must physically inspect a consignment where one or more of the following applies:

- An IHS or PTI specifically requires this.
- Infestation or contamination is possible due to the type of goods.
- The description of the goods is in doubt.
- You are unfamiliar with the goods and the description is inadequate to assess the risk.

[940] Clause 7.3.3 provided that when inspecting a consignment the inspector was also required to inspect any associated packaging for contaminants. Clause 7.3.4 directed an inspector to use the sampling plan in Appendix 1 unless the product was seeds.

[941] Clause 7.4 was headed “Nursery Stock”. This section was said to be additional to the procedures already outlined. It included the following provisions:

7.4.2 Documentation

7.4.2.1 Any Nursery Stock must be identified to species level and the name(s) provided to you in typed or written form. If you have cause to doubt the credibility/accuracy of the information provided you should have the identification confirmed. When precise endorsements are required or if specifically mentioned in the standard then the accompanying PC must identify the nursery stock to genus level. The contents of the consignment and the documentation must be reconciled to ensure each lot within the consignment has been identified and no unidentified lots are present.

Note: Use your discretion when reconciling consignments of nursery stock which is frozen, semi frozen in media, or similar; the object of reconciliation is to gain reasonable confidence about the contents of a consignment rather than count every item.

[942] Clause 7.4.3 concerned “Inspection” of nursery stock. It included the following provisions.

7.4.3.1 All nursery stock must be inspected at the port of entry or at specifically approved transitional facilities designed for nursery stock inspections. The inspection must include the prescribed sample (refer 7.4.3.2) and reconciliation as per 7.4.2.1. Please note that PEQ facilities are not approved facilities for on-arrival inspections of nursery stock.

7.4.3.2 For sampling of all plant products and nursery stock including plant material for PEQ, dormant bulbs, etc use the sampling plan as outlined in Appendix 1.

[943] Appendix 1 set out a sampling plan for the inspection sample size per lots in units of 1-50, 51-100, 101-200 and so on up to units of over 5000. It also provided (as per the IHS):

A randomly drawn sample of 600 units, from each homogenous lot within in a consignment, shall be inspected on arrival. Where a lot is comprised of less than 600 units, 100% inspection is required.

[944] James McLaggan, team manager for the Target Evaluation team, described the Process Procedures as basically a working instruction on how to clear plants and plant products and was giving effect to the IHS. Mrs Willmot described them as operating instructions which could be consulted on the job if something unfamiliar arose. She agreed they applied both to Target Evaluators and Quarantine Inspectors. However she considered it was not a very helpful document as the notes it contained were “fairly basic”. She said they now have Border Operating Procedures which are reviewed along with the IHS. Mr Hodges said he received training on the Process Procedures and that it was one of the documents available to him when deciding whether to clear the June 2009 consignment.

Was inspecting the contents of the June 2009 consignment mandatory?

[945] The first question that arises from the defendant’s submissions is whether inspection of risk goods was a mandatory or discretionary requirement. The defendant submits that “satisfied” under s 27 of the Act must confer a discretion on the inspector about how satisfaction is achieved. As s 27 does not expressly require a visual inspection of risk goods, whether an inspection is required to be satisfied of the matters in s 27 is therefore a matter of discretion for the inspector.

[946] I accept that s 27 in and of itself does not require a visual inspection of the contents of a consignment. That would bring the clearance of goods at the border to a stand-still. Section 27 does require that the clearance of risk goods addresses each of the matters set out in paragraphs (a) to (e) of that section. An inspector must be satisfied about those matters. It does not specify how that it is to occur. Therefore whether an inspection of the goods is necessary will depend on the circumstances.

[947] By way of example, s 27(d) required an inspector to be satisfied the goods displayed no signs of harbouring organisms that may be unwanted. That does not mean that all goods at the border must be checked for signs that they harbour unwanted organisms. MAF's procedures (through the IHSs, the target evaluation system and the Process Procedures) identify the goods which may need an inspection. If, for example, an IHS does not require a physical inspection of the contents of a consignment and the Target Evaluator identifies no particular issue with the consignment on the basis of the documentation, then absent any other information a Quarantine Inspector will not need to inspect a consignment in order to be satisfied that clearance can be given. This was the view of the border personnel who gave evidence. It was also the view of Dr Butcher, the Manager of the Plant Imports and Exports Group at the relevant time, which is discussed further below.

[948] Therefore the question in this case is whether MAF personnel acted reasonably in being satisfied of the matters in s 27.

Did MAF personnel act reasonably in deciding not to visually inspect the June 2009 consignment?

[949] For the reasons already discussed, Ms Edel-Singh did not make a decision on whether the consignment was to be inspected. That was a decision for the next Target Evaluator when the correct documentation was provided and the application for clearance went to the top of the EBACCA queue. Alternatively, if the correct documentation was presented at Air New Zealand Air Cargo, it was a decision for the Quarantine Inspector who would undertake both target evaluation and quarantine inspection tasks at that location. There was no lack of reasonable care at this stage of the process.

[950] Once Mr Hodges had the correct paperwork he needed to be satisfied of the matters in s 27 in order to clear the consignment. One of those requirements was that the goods "comply with the requirements specified in the IHS". In this case the border personnel considered the IHS did not require an inspection for pollen. This is evident from Mr Hodges' evidence, but also from a range of other evidence. For example:

- (a) Mrs Willmot reviewed what she had done when she gave a release BACC for a consignment of kiwifruit pollen on 14 January 2010. She identified issues with the phytosanitary certificate, initially thought the cuttings and tissue culture section of the Nursery Stock IHS applied and because of that sent a NCR concerning the certificate and the absence of an address for post entry quarantine. Then she realised the pollen section applied, granted a dispensation for the timeframe to rectify the issues with the phytosanitary certificate and released the consignment. She did not give an inspection BACC for the consignment.
- (b) Mrs Willmot reviewed all the other kiwifruit pollen imports between 2008 and 2012. These imports were either by Kiwi Pollen (between 2008 and 2010) or Plant & Food Research (between 2010 and 2012). Of the seven Kiwi Pollen imports, three had no inspections recorded as having been made, two had packaging-only inspections, and the remaining two (which had come through with airport passengers) are likely to have been shown to airport inspectors. Of the seven Plant & Food Research imports, two had no inspections recorded, two had packaging-only inspections, and the remaining two (which had come through with airport passengers) are likely to have been shown to airport inspectors.
- (c) Mr McLaggan said he would not have expected the June 2009 anthers consignment to have been physically inspected at the border.

[951] In contrast, witnesses from MAF's import plant team believed the IHS did require inspection or at least expected an inspection would occur. For example, Dr Butcher's evidence on the point was as follows:

- Q. ... Now firstly before we come back to the 2017 document, is that your expectation too, that as at the relevant times covered by this litigation back in '06, the period '08, '09, that inspection was to happen, or was required to happen for all nursery stock including pollen?
- A. There is a general expectation that there will be a verification of the material as it comes through the border, and that verification includes document checking and most often includes a direct inspection of the

product itself. The challenge with that is that it's not always possible to do the direct inspection. As an example if you have packets of seed that are hermetically sealed, because they are particularly sensitive, if you attempt to inspect those by opening the seal, you're then destroying the product. So ... we recognise that there are circumstances in which it is not possible to ... conduct a physical inspection of a product as you might expect would happen under most circumstances. And as I indicated your Honour we're talking about a verification activity that is verifying against a set of requirements which are contained in the standard and it's important, I guess it's reflected in the changes that we have made to the import health standards subsequent to this day here, where it indicates that to importers of the product may be inspected, but the obligation is on the operational teams to determine the best way to verify that the goods meet the requirements. In some cases, in many cases, in fact most cases I would suggest, a physical inspection is a very appropriate inspection for certain types of pests, you know, they have to be visible to the naked eye or with a 10 times lens, something like that, but you cannot inspect for viruses or bacteria, things like that. So the verification activity needs to ... take into account the issues that ... may be associated with the commodity itself.

Q. If I can break that down to distinguish between current practice and keeping my questions to the 2017 document, and as opposed to past practice. The past practice was that you expected inspection, but recognised that occasionally it might be impractical?

A. Correct, yes.

Q. And the past practice was that you regarded the nursery stock IHS as in fact requiring inspection?

A. Yes. So there was a requirement in the standard for ... a physical inspection of the product, particularly focused on those things which are amenable to that physical inspection. So, your Honour, it would be for contaminant material that was visible. It would be ... to make sure that the product met the description on the phytosanitary certificate and it would be for signs and symptoms of pests or disease, and that's large bugs, obviously not bacteria and things like that, but the expectation was that in most, certainly in most circumstances there would be an inspection done unless there was a procedure that was done at the border that was different to that.

Q. Right, and that means, does it, that as at the historic stage, mid-2000s, Ms Dickson gave evidence that she, when dealing with permits, would have assumed inspection was going to happen, that would have been the general working assumption for a product such as pollen which wasn't hermetically at risk in the way that some seeds might be?

A. That's correct. So there is a general expectation that there will be a physical inspection of the product in most circumstances.

[952] Ms Campbell said it was "a requirement of the IHS for all nursery stock to be inspected at the border". Therefore, if a consignment of anthers arrived under the

pollen permit, she would have expected a question to have been asked of the Plant Imports team “is this okay”.

[953] Mr Hartley said:

A. ... my expectation would have been that as a matter of course, material was inspected on arrival by quarantine officers; one to verify that the permit conditions had been met as identified or as confirmed by the phytosanitary certificate, that exporter/importer details lined up as per the phyto, that the volume of material aligned if there were specific requirements within the actual permit around permitted volumes and obviously that the product was as described by the permit.

Q. Thank you, that’s helpful.

A. Sorry, in addition to looking for or a visual check for regulated pests and diseases.

The Court:

Q. Sorry what did you say then?

A. In addition to visual inspection for regulated organisms.

Q. So you –

A. So that would have been my clear expectation

[954] Mr Baring, who had experience both as a border inspector and in setting conditions pre-border, said he did not know if he had any expectation at the time, but he “would have thought it would be inspected”. He thought a packaging check would be made, as that is always conducted, but he would have expected a visual check as well to make sure it was what it said it was.

[955] Ms Dickson’s evidence on the point was as follows:

A. ... and you’re probably going to ask me about inspection at the border. Well, you are now, I suppose. I think there was a general feeling that product imported under the Nursery Stock Standard or the Seed for Sowing Standard would require inspection at the border, but I’ll also add that it would have been more robust to have had that on this permit, but yes.

[956] Dr Herrera, from PHEL, also considered that an inspection was a requirement of the Nursery Stock IHS.

[957] The confusion was caused by the limited reference to pollen in the IHS. Border staff focused on what the IHS said about pollen specifically. This referred only to a requirement for a permit. In contrast, the import plant teams were clear that pollen was “nursery stock” and therefore required an inspection. I agree with them that this was a correct interpretation of the Nursery Stock IHS. Pollen was “nursery stock” because it was “parts of plant imported for growing purposes” and because it was specifically dealt with in the Nursery Stock IHS.

[958] I do not agree with the defendant’s submission that there was any difficulty reconciling an inspection requirement with the sampling plan. The definition of “unit” in the IHS provided guidance. If a plant, bulb or cutting was a unit, and a vessel containing a tissue culture was also a unit, a fair and reasonable interpretation of a consignment of pollen would be to treat the package(s) in which it came as a unit. This would mean that each package of pollen required inspection. This is how the consignment was described in the BACC release signed Mr Hodges which described the Goods No as “1”, the Type as “Nursery Stock” and other details as “1.000 unit(s).” In any event, if there had been doubt about this, guidance could have been sought from a team leader or from the Plant Imports team.

[959] Having said that, in my opinion the Nursery Stock IHS could have been expressed much more clearly if visual inspection of the contents of a consignment of pollen was required. The definition of “nursery stock” did not refer to pollen. The only mention of pollen was in 2.2.3 and the only requirement that expressly applied to pollen was the requirement that it have a permit. As Mrs Willmot put it:

Paragraph 2.2.3 of the standard (which deals with pollen) says to me “take all you need to know about the pollen from the import permit”. The import permit is related to the Nursery Stock IHS, so by the rules of any permit you should still be looking at the IHS. But with such a small amount of guidance I probably would just look at the permit and go “okay I’ll just deal with it as per the permit, and the permit does not specifically say to me that the pollen should be inspected”.

[960] In my view Mr Hodges did not fall below the standard of reasonable care when he consulted the Nursery Stock IHS (as I accept he is likely to have done) and determined that inspection of the contents of the pollen consignment was not required by the IHS. If he consulted the Process Procedures as well, the same decisions could

reasonably have been made. That did not add any clarity to the IHS. It required an inspection if an IHS or a permit required this. It also required an inspection if the goods were nursery stock. However “nursery stock” was defined in the same way as the IHS, without any specific reference to pollen.

[961] I therefore agree with Ms Dickson’s view that it would have been clearer to have included a requirement for visual inspection as part of the conditions of the permit. Absent that condition, Mr Hodges’ decision not to carry out a visual inspection did not lack reasonable care with reference to the IHS, or with reference to the Process Procedures which directed an inspection if the IHS required. This means that whether Mr Hodges inspected the contents of the consignment was a matter for him to assess in the circumstances.

[962] I accept Mr Hodges reasons, as to why it was likely he decided not to inspect the consignment’s contents, were reasonable. Those reasons are supported by Mr McLaggan. Mr McLaggan said he would not have expected the consignment to be inspected because insects would not be present on frozen pollen, opening a package would risk destroying the goods particularly where keeping the temperature low is important and the goods had come in on the commercial pathway with documentation which can generally be trusted.

[963] Mr Hodges’ reasons were also supported by Mrs Willmot. She did not direct an inspection of a consignment of Chilean pollen. She said factors which she would have likely taken into account were that it had an import permit which meant that somebody in the Plant Imports team had assessed the risk, the IHS referred only to a permit and the permit did not say an inspection was required, and there would be nothing to see because any insects would be dead (and the importer may notice them and contact MAF anyway), and they would not see viruses or bacteria without a microscope and they would not know what they were looking for anyway.

[964] The plaintiffs submit the fact that the consignment was frozen was not a relevant reason. They point out that the Process Procedures specifically contemplated inspection of frozen nursery stock (cl 7.4.2) and Mr McLaggan and Mr Hodges accepted it would be possible to inspect the consignment without damaging it. It is

correct that the Process Procedures contemplate nursery stock may arrive frozen. However they do so by indicating that discretion is required when reconciling the number of lots with the consignment documentation. The fact that a frozen consignment can be inspected without damaging it does not mean its frozen status is irrelevant to a Quarantine Inspector's decision on whether to inspect it.

[965] I conclude that MAF did not breach a duty owed to the plaintiffs by failing to visually inspect the contents of the June 2009 anthers consignment.

Were there discrepancies in the documentation that ought to have led to inspection?

[966] The next question is whether Mr Hodges could reasonably be satisfied that there were no discrepancies in the documentation that suggested it might be unwise to rely on that documentation. The discrepancies in the documentation for the June 2009 anthers consignment were as follows:

- (a) The phytosanitary certificate referred to a quantity of 4.5 kg whereas the air waybill referred to 11 kg.⁴⁸²
- (b) The exporter's name on the permit was Bexley Incorporated, whereas the address of the consigner on the phytosanitary certificate was Hangzhou Yuehao Agricultural Technology Consulting Co Ltd.
- (c) The import permit was for *Actinidia deliciosa* pollen. The phytosanitary certificate stated the consignment contained *Actinidia arguta* pollen.

[967] The first of these differences did not feature in the plaintiffs' closing submissions. The evidence of Mr Hodges and Mr McLaggen is that the difference in weight would not have caused any concern. The air waybill contains the gross weight including the packaging whereas the phytosanitary certificate contains the net weight of the product. The import permit was for frozen pollen. Frozen products often have

⁴⁸² The store release docket from International Cargo to Kiwi Pollen also described the consignment as "Packages:1/11 KG".

ice packs and this and other packaging could account for the difference. I accept this evidence and consider Mr Hodges did not fail to take reasonable care on this aspect of the documentation.

[968] As to the second and third of these, Mr Hodges said his normal practice would have been to send a NCR to the Plant Imports team about both of these. He said an alternative for the exporter discrepancy would be to follow up with the importer to provide a permit that listed the correct exporter details. Mr McLaggan said:

Q. ... I think you were saying had that been seen at the risk assessment stage that would have prompted an inspection per PP41?

A. That may have prompted a non-conformance report to be sent to Wellington to say, "We have a phytosanitary certificate with the wrong species and the wrong importer on. What should we do?"

Q. Okay, when you say it may –

A. In fact, I would hope that that's what it would do.

Q. It should have.

A. Yes.

[969] Mrs Willmot agreed the difference in species would normally lead to a NCR or, alternatively, a new phytosanitary certificate might be sought. Ms Edel-Singh agreed that irregularities in the phytosanitary certificate would normally be dealt with by issuing a NCR. Mr Baring said the decision as to whether there was a technical non-compliance depended on the degree or extent of discrepancy such that one discrepant detail might not lead to a technical non-compliance, but three definitely would.

[970] I consider the failure to identify the discrepancies of the exporter and the species details between the phytosanitary certificate and the import permit was an error that ought to have been noticed. I consider it ought to have led Mr Hodges to make a decision about what to do about those errors.

[971] However this does not mean there was a breach of a duty to the plaintiffs to take care in this respect. The requirement in s 27 is that an inspector be satisfied that there are no discrepancies "that suggest it may be unwise to rely on the documentation".

MAF had procedures for how discrepancies were to be addressed. Either the inspector could go back to the importer to obtain clarification from the exporter and a new phytosanitary certificate. Or, more usually, the inspector would generate an NCR.

[972] I do not accept the plaintiffs' submission that it was mandatory to carry out an inspection of the contents of the consignment pursuant to the Process Procedures. These were a guide to assist Quarantine Inspectors. A judgment was still to be made. In this case, although cl 7.3 of the Process Procedures stated goods were to be inspected if their description was in doubt, inspectors would not normally seek to address the discrepancies by opening the consignment. This would not help with the exporter name and, because the discrepancy in description of the goods was about the species, it would require an inspector to be able to identify which species of kiwifruit pollen had been imported.

[973] In this case, if an NCR had been generated, the evidence is that the difference in exporter name would not have concerned the Plant Imports team. Mr Baring, who had worked both at the border and at Plant Imports, did not regard the name of the exporter generally as being important. He said the exporter names changed all the time and importers would get upset that MAF would charge them \$166 for the change when it was not really a big deal. He also said there was a time when NCRs were flooding in and they needed to be dealt with quickly as holding the goods at the border meant importers would be incurring a charge.

[974] In fact Ms Hamlyn had emailed the Plant Imports team in May 2009 to ask whether the name of the exporter on the phytosanitary certificate issued by the National Plant Protection Organisation (NPPO) must match exactly the name on the import permit. Ms Campbell (née Dalley) replied that it was not important in this case, and as long as the certificate included the correct additional declaration there should be no problem. That is the case because the risk assessed by the Plant Imports team was based on country of origin not on who the exporter was.

[975] As to the discrepancy in species name, the likely consequence of an NCR is more finely balanced. Mr McLaggen accepted in cross examination that if Mr Hodges had issued an NCR then an inspection would need to happen if the consignment was

not to be destroyed. He also accepted the Process Procedures said inspection was to be carried out if the contents of the consignment was in doubt. However it was clear his view was that he would do whatever “Wellington” said was to be done in response to the NCR.

[976] As to Wellington, Ms Campbell, Mr Baring, Ms Dickson and Mr Hartley all said that they had a general expectation when a permit for pollen was issued that there would be inspection at the border clearance stage. This supports the plaintiffs’ argument that there would have been inspection had the matter been referred to the Plant Imports team through an NCR.

[977] On the other hand, what they expected when they issued pollen permits is not necessarily what would have occurred in response to an NCR. It is certainly possible Plant Imports would have asked whether an inspection had been carried out (and thereby learned that it had not). But it is not necessarily what would have happened. Dr Butcher said that there is no way of knowing exactly how the NCR would have been dealt with by the Plant Imports team at the time. This is because the NCR process is essentially another assessment process. It is based on the nature of the discrepancy and whether this materially changes the risk that MAF is dealing with. Plant Imports did not have any policy document which stated what was to occur.

[978] As the defendant submits, the *Actinidia* schedule of the nursery stock IHS applies to all *Actinidia* species such that any requirements applied to one species would also apply to all others. The biosecurity risks of *arguta* pollen were therefore the same as *deliciosa*. As Mr Baring explained, there was also time pressure on the Plant Imports team not to hold up consignments. Mr Baring also said, that when he was in the Animals team they were getting NCRs all the time, many were just repeat ones that made subtle changes but which did not change the veracity of the document. He said:

Some were easy. Some were hard. You had to drop everything because [its] at the border and the importer is incurring charges. You’re under pressure to do it.

[979] In this case the phytosanitary certificate was an original one. It contained the necessary declaration, to conform to the permit, that the pollen had been produced from hand collected and unopened male flower buds only.

[980] In these circumstances it cannot be said with any confidence that an NCR concerning the species would have led to the consignment being destroyed or inspected. If, instead, contact had been made with the importer for clarification of the species, it is quite possible the border staff would have been told the species name was incorrect on the certificate. That is because Ms Hamlyn is confident she received anthers from the *deliciosa* species, not *arguta*. The mistake as to species was therefore in the certificate, not in the contents of the consignment (which, as it happened, contained anthers rather than milled pollen).

[981] The plaintiffs have the burden of proof. I am not satisfied they have discharged it on this issue. I am not persuaded on the evidence that it is more probable than not that, with the exercise of reasonable care, the June 2009 anthers consignment would have been inspected, destroyed or returned to the exporter rather than being cleared and dispatched to Kiwi Pollen.

Conclusion

[982] On balance the plaintiffs have not established that the June 2009 anthers consignment would not have reached its destination at Kiwi Pollen if MAF personnel had exercised reasonable care at the border.

Part 6: Causation

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Introduction

[983] To make out a negligence claim a plaintiff must establish: a duty of care owed by the defendant to the plaintiff (duty); a breach of that duty (breach); the breach caused the loss suffered by the plaintiff (causation); the plaintiff suffered loss that is recoverable (loss which is not too remote). This part of the judgment is concerned with one aspect of causation: whether the plaintiffs have proven that the Psa3 outbreak came from the June 2009 consignment of anthers imported by Kiwi Pollen.⁴⁸³

Summary of respective submissions

[984] The plaintiffs submit the June 2009 anthers consignment, which originated from Shaanxi, China, was the source of the Psa3 outbreak in New Zealand. They say the following combination of facts prove this on the balance of probabilities:

- (a) Kairanga, the orchard owned by Kiwi Pollen's principals, and the neighbouring orchard, Olympos, were the epicentre of the New Zealand outbreak. Of the two orchards, Kairanga had the most advanced symptoms at the time the outbreak was discovered.
- (b) Plant material and kiwifruit pollen are known to be vectors for Psa3. Plant material is particularly high risk.
- (c) The consignment was of anthers, it was cleared on 30 June 2009 and was processed into pollen at Kiwi Pollen's Main Road premises.
- (d) There were multiple opportunities for the contents of the June 2009 consignment to infect Kairanga and Olympos. These opportunities are consistent with the timing of symptoms at those orchards.
- (e) The genetic evidence links the New Zealand Psa3 strain to Shaanxi, where the anthers came from.

⁴⁸³ See Part 1: Overview and summary (the questions for Stage 1).

- (f) A subsequent consignment of kiwifruit pollen imported by Kiwi Pollen was intercepted by MAF and tested positive for Psa3.

[985] The defendant submits the plaintiffs have failed to prove that Psa3 entered New Zealand via the shipment of anthers that was cleared by MAF personnel on 30 June 2009. This is because he says the plaintiffs have failed to prove the anthers consignment contained Psa3 and they also failed to prove the anthers were applied to, or otherwise ended up on, any kiwifruit orchard so as to give rise to the infection. He says:

- (a) The genetic evidence does not provide a sound basis to conclude the anthers were the source of the New Zealand incursion.
- (b) There is no evidence the anthers contained Psa3.
- (c) The plaintiffs cannot rely on geographic proximity of the milling of the anthers and the outbreak. This is because the anthers were milled at Kiwi Pollen's Main Road premises which is more than seven km from the Olympos and Kairanga orchards.
- (d) In the absence of geographic proximity there is no tenable way for any Psa3 in the anthers to have infected the orchards. This is particularly because it is not known which orchards were first infected with Psa3 (the evidence does not support a ground zero or epicentre theory at the Olympos and Kairanga orchards), and because the timing of symptoms in Te Puke is incompatible with infection through pollination (by direct application or cross-contamination) in either October 2009 or October 2010.
- (e) It remains impossible to say how Psa3 entered New Zealand. It is not known which orchards were first exposed to Psa3. There is a tangled web of potential pathways, many of which could never be investigated because they are inadvertent or illegal. No other major kiwifruit-

growing country has been able to prevent Psa3 or identify a pathway for its entry.

[986] The factual issues are:

- (a) Were Kairanga and Olympos the epicentre of the outbreak and can it be said which orchard had the most advanced symptoms when the outbreak was discovered?
- (b) Where did the anthers come from in Shaanxi and what happened to them once they arrived at Kiwi Pollen?
- (c) What is known about plant material and kiwifruit pollen as a vector for Psa3 and could the Shaanxi anthers have contained Psa3?
- (d) If the anthers were infected with Psa3, were there opportunities for this to infect Kairanga and/or Olympos, how likely are they, and are they consistent with the timing of the symptoms at those orchards?
- (e) Does the genetic analysis link the New Zealand Psa strain to somewhere in close proximity to the orchard from where the anthers came?
- (f) Are there other matters that assist with determining whether the Psa3 outbreak came from the June 2009 consignment of anthers?

Relevant legal principles

[987] The plaintiff in a negligence claim bears the onus of proving that the defendant's alleged breach of the alleged duty caused the harm complained of. This requirement establishes the necessary nexus between the defendant's wrongdoing and the plaintiff's loss. For this to be made out the defendant's alleged breach must be a cause in fact and a cause in law. It must also be sufficiently closely connected with

the damage to justify the imposition of liability (the remoteness question).⁴⁸⁴ At this stage it is only the cause in fact aspect that requires determination.

[988] The standard of proof is the balance of probabilities.⁴⁸⁵ In this case, this means being satisfied the plaintiffs have established it is more likely than not that the Psa3 incursion originated from the June 2009 anthers consignment.

[989] The plaintiff can establish the necessary factual causal nexus by leading either direct or circumstantial evidence.⁴⁸⁶ It is common for causation to be established through circumstantial evidence in negligence claims (particularly in claims alleging breaches of duty through omissions by public bodies) since there is usually a lack of direct evidence upon which this can be shown.⁴⁸⁷ The circumstantial evidence must show the defendant's negligence more likely than not caused the harm suffered by the complainant.⁴⁸⁸

[990] Wigmore characterises the process of circumstantial reasoning as being like “links in a chain” or “strands in a cable” which needs to bear the weight of the inference that the complainant is asking the court to draw.⁴⁸⁹ A “links in the chain” process requires the court to be convinced of each individual factual “link” needed for the relevant inference; whereas a “strands in a cable” method requires the court to examine all the “strands” of circumstantial evidence as a whole and ask whether the “cable” they are mutually supporting can support the inference on the balance of probabilities. The case put forward by the plaintiffs is a “strands in the cable” circumstantial case.

[991] A court must be careful to draw the distinction between mere conjecture and a reasonable inference, as was discussed by Lord MacMillan (dissenting on the facts) in *Jones v Great Western Railway Company*:⁴⁹⁰

⁴⁸⁴ *Todd on Torts* at 1098.

⁴⁸⁵ M A Jones (ed) *Clerk & Lindsell on Torts* (21st ed, Sweet & Maxwell, London, 2014) at [2-07].

⁴⁸⁶ C T Walton (ed) *Charlesworth & Percy on Negligence* (13th ed, Sweet & Maxwell, London, 2014) at [5-45].

⁴⁸⁷ *Jones v Great Western Railway Company* [1930] All ER Rep Ext 830 at 842 per Lord MacMillan.

⁴⁸⁸ *Charlesworth & Percy on Negligence* at [5.45].

⁴⁸⁹ J H Wigmore *Evidence in Trials at Common Law* (Chadbourn revision, Little Brown and Company, Toronto, 1981), vol 9 at 414.

⁴⁹⁰ *Jones v Great Western Railway Company* [1930] All ER Rep Ext 830 at 842 per Lord MacMillan.

The dividing line between conjecture and inference is often a very difficult one to draw. A conjecture may be plausible, but is of no legal value, for its essence is that it is a mere guess. An inference in the legal sense, on the other hand, is a deduction from the evidence, and if it is a reasonable deduction it may have the validity of legal proof. The attribution of an occurrence to a cause is, I take it, always a matter of inference. The cogency of a legal inference of causation may vary in degree between practical certainty and reasonable probability. Where the coincidence of cause and effect is not a matter of actual observation there is necessarily a hiatus in the direct evidence, but this may be legitimately bridged by an inference from the facts actually observed and proved.

[992] A court must also ensure that it does not fall into the trap described by Lord Mance in *Datec Electronic Holdings Ltd v United Parcels Service Ltd*. That trap is to systematically consider possibilities raised by the circumstantial evidence, which turns into a process of elimination that only leads to an inference supporting the least unlikely cause.⁴⁹¹ In *The Popi M* Lord Brandon characterised this as the “unjudicial dictum” of Sherlock Holmes that “when you have eliminated the impossible, whatever remains, however improbable, must be the truth”.⁴⁹² A court is not bound to make a finding in favour of one inference of causation or the other. If all of them are independently improbable then it must decide that none meets the balance of probabilities and that the claim should fail for want of causation.⁴⁹³ A court must take a common-sense and pragmatic approach to the evidence in deciding whether to make the suggested inference.⁴⁹⁴

[993] Lord Justice Toulson gave further guidance in *Milton Keynes Borough Council v Nulty*.⁴⁹⁵ He observed that in assessing a circumstantial case the court should ask itself whether the strands of circumstantial evidence are best accounted for by the explanation suggested by the plaintiff. This assessment will necessarily involve looking at: all the strands of circumstantial evidence as a whole (including what gaps there are in the evidence); whether the individual strands relied upon are in themselves properly established; what factors point away from the suggested inference; and what other explanations might fit the whole of the evidence (including, obviously, any

⁴⁹¹ *Datec Electronic Holdings Ltd v United Parcels Service Ltd* [2007] 1 WLR 1325 at [48]-[50] per Lord Mance.

⁴⁹² *Rhesa Shipping Co Ltd SA v Edmunds* [1985] 2 All ER 712 [*The Popi M*] at 718 per Lord Brandon.

⁴⁹³ *The Popi M*.

⁴⁹⁴ *Clerk & Lindsell on Torts* at [2-07].

⁴⁹⁵ *Milton Keynes Borough Council v Nulty* [2013] EWCA Civ 15 at [34].

explanations suggested by the defendant). At the end of this assessment, the court must.⁴⁹⁶

... stand back and ask itself the ultimate question whether it is satisfied that the suggested explanation is more likely than not to be true.

The civil “balance of probability” test means no less and no more than that the court must be satisfied on rational and objective grounds that the case for believing that the suggested means of causation occurred is stronger than the case for not so believing...

[994] Spigelman CJ in *Seltsam Pty Ltd v McGuinness* also indicates that a similar approach is taken to circumstantial cases in civil courts in Australia.⁴⁹⁷ Giving judgment on the use of epidemiological or other statistical evidence for establishing causation in asbestos poisoning cases, his Honour noted:⁴⁹⁸

As I have also noted above, a circumstantial case can involve drawing a conclusion on the balance of probabilities, or indeed beyond reasonable doubt, on the basis of facts which are expressed only in terms of possibility. Whether or not the inference is open or should be drawn, depends on the quality of the underlying facts, particularly in terms of the degree of “possibility” which is involved.

[995] I approach the causation question in this case on the basis of these principles.

The epicentre

Submissions

[996] The plaintiffs submit that the Kairanga and Olympos orchards formed the ground zero or epicentre of the disease outbreak in New Zealand. They say this is consistent with the general epidemiology of Psa, the advanced nature of the symptoms at RP1 and RP2, the course of the spread and the scientific evidence compiled by MAF and other researchers to trace the genesis of the incursion. The defendant submits this evidence does not provide a safe basis to conclude that there was a ground zero or epicentre for the outbreak.

⁴⁹⁶ At [35].

⁴⁹⁷ *Seltsam Pty Ltd v McGuinness* [2000] NSWCA 29.

⁴⁹⁸ *Seltsam* above at [153] per Spigelman CJ. Spigelman CJ’s dicta has been discussed favourably in *Accident Compensation Corporation v Ambros* [2007] NZCA 304 at [74] per Glazebrook J; *Fleming’s The Law of Torts* at [9.70]; *Charlesworth & Percy on Negligence* at [6-40]; and *Todd on Torts* at 1109.

General epidemiology of Psa

[997] For present purposes, the following matters about the general epidemiology of Psa3, and which are not in dispute, are relevant:

- (a) Psa3 is a bacterial pathogen. It reproduces clonally and can expand from one cell to millions in a matter of hours. It infects kiwifruit plants by entering through natural openings and lesions in the plant tissue.⁴⁹⁹
- (b) Psa3 is an epiphytic bacterium. This means it can potentially survive on the surface of a plant without causing any harm to it, while multiplying by deriving its moisture and nutrients from the air, rain and debris accumulating around it. This epiphytic colonisation can take place on any part of the plant so long as there is enough moisture and nutrients around to help it multiply. The epiphytic stage does not express itself through any symptoms, except some leaf spotting.
- (c) Psa3 is also an endophyte. This means that it can infect a plant and remain latent or dormant within it without displaying visible signs of infection. At this stage the bacteria has not multiplied to the extent needed for symptom expression. The symptoms develop rapidly after some pre-disposing event occurs (e.g. a critical population is reached, environmental conditions become conducive for the spread of symptoms, or a certain stage in the plant's growth is reached).
- (d) Psa3 causes primary and secondary symptoms. The most common primary symptom is the appearance of angular leaf spots with chlorotic halos around it. Secondary symptoms occur when the bacteria has multiplied to the point that it has invaded the internal tissue and has begun to affect the plant's ability to obtain water or nutrients and to carry out some or all of its biological functions. These symptoms

⁴⁹⁹ Natural openings are openings on leaves, vines, trunks and other openings for conducting natural exchanges with water, oxygen, carbon dioxide and nutrients. Lesions are scars or wounds on the plant caused by humans, insects, animals and weather (e.g. pruning wounds, frost damage, fruit and leaf scars, cicada egg lesions, wind, hail and frost damage).

include: white or red exudate ooze from lenticels; cankers on vines and trunks; browning and wilting of buds and flowers; flower drop; wilting and rolling leaves; collapse of fruit; cane dieback; and the death of plants.

- (e) Once the bacteria has established, it can be expected to spread further providing the conditions for this are met. The place where it became established can become the focal point of another infection and continue its spread.
- (f) Psa3 can spread within and across orchards through a variety of natural and human-assisted pathways. These include through being carried in wind or rain; being carried on insects (including those that bite into kiwifruit vines such as cicadas and leaf hoppers), birds and bees; artificial pollination; being carried on contaminated tools and equipment; and other ways that plant material may move from one orchard to another. It multiplies quickly in the presence of kiwifruit material under wet conditions.

[998] In short, Psa3 can be present in one location, then multiply and spread within the plant and beyond. When plants exhibit secondary symptoms, the bacteria has multiplied to the point where the plant's functioning is affected and the inoculum level for infection to other plants is high. The epidemiology is therefore consistent with an incursion that has an epicentre from which the disease spreads.

RP1 and RP2 the first to report symptoms

Olympos (RP1)

[999] Olympos orchard is at 37 Mark Road, Te Puke. All the female vines were Hort16A gold. The orchard is owned by Russell West and managed by his brother, Peter West (Mr West). Mr West kept a detailed diary for his work. From that diary he is able to give the following background to the symptoms as they were first noticed on the orchard:

- (a) On 19 April 2010 Mr West and his wife, Gail, were visiting the orchard. They noticed that all the male vines, located in two blocks (CK2 and CK3), had died back. He called three other kiwifruit growers, including Murray Holmes who owns a neighbouring orchard at 41 Mark Road, to discuss their views on the cause of the sudden dieback. Mr Holmes suggested it was from over trimming, but Mr West did not believe that to be the cause as there had been nothing unusual about the trimming work carried out.
- (b) Because the male vines had died back, Mr West did not anticipate many flowers from them. He decided to arrange for artificial pollination from Kiwi Pollen. This was the first time he had decided to use artificial pollination. He arranged for beehives to be put into the orchard in batches on 8, 11 and 14 October 2010 (they were removed on 26 October 2010). Brett Limmer from Kiwi Pollen carried out the artificial pollination on 13 and 16 October 2010.
- (c) On 21 October 2010, Bobby Singh, a pruning contractor who was working at the orchard, reported to Mr West that he had noticed “a sick vine ... right in the middle, one row from the old light stand”.
- (d) Because of Mr Singh’s report, Peter West inspected the vine on 23 October 2010 and noticed “a funny speckle on the gold leaves in Olympos.” This caused him to contact EastPack (Olympos’ post-harvest operator) on 25 October 2010, Zespri on 27 October 2010, and HortResearch and Peter Lyford (an orchard management consultant) on 28 October 2010. As part of this, on 28 October 2010 leaves were sent to Dr Everett at Plant & Food for testing.
- (e) A plan was produced of the symptoms. By 31 October 2010 there were around 10 rows of vines affected in a small area of about five hectares between the shelter belts at the orchard; altogether there were about 70 vines in a circle with high levels of leaf spotting and some flower loss. The leaf spots were described as small halo-like and angular spots.

- (f) On 5 November 2010 MAF (Heather Pearson) telephoned Russell West to advise the orchard had tested positive to Psa. She also telephoned Mr West on 6 November 2010.

[1000] From there, the evidence is that:

- (a) On 6 November 2010 Olympos was declared RP1. On that day Shane Max (from Zespri), Dr Vanneste (from Plant & Food) and Peter Lyford visited the orchard and walked through the entire orchard. By that stage, there was a lot of obvious leaf spotting, some fruit drop, sepal browning in an elliptical shaped patch of approximately 10 vines and one case of shoot dieback. There were no cankers or exudate. Mr Max said he noticed the male vines had been pruned quite severely. He would have expected to have seen oozing if there had been dieback in April 2010.
- (b) Rob Taylor, a senior scientist from MAF visited RP1 on 8, 9 and 10 November 2010. He described the symptoms as severe and prevalent, initially localised in the middle and spreading out across the rows. The most conspicuous symptoms were dark/brown angular leaf spots that were sometimes surrounded by yellow halos. Mr Manning (Plant & Food) noted on 9 November 2010 “severe leaf spots, loss of buds and fruitlets, dark canes and possibly some wilting of shoots”.
- (c) Video footage of the symptoms was taken on 11 November 2010. Mr Max, who was present that day, described the symptoms as “predominantly leaf spots”, which had spread across and down the block, and “additional cane and shoot dieback”. These symptoms were mostly on the female vines.
- (d) Cankers were not seen at Olympos until about February 2011.

Kairanga (RP2)

[1001] Kairanga is an orchard at 36 Mark Rd, Te Puke. It is across the road from Olympos. It is owned and managed by Graeme Crawshaw. He and his wife, Jill Hamlyn, are also the principals of Kiwi Pollen. At the time of the Psa3 outbreak, Kairanga was entirely Hort16A organic. Kairanga used artificial pollination in 2009 and 2010.

[1002] In spring 2009 Mr Holmes noticed some of the vines at Kairanga looked to be “going bad”. He did not know what it was and thought it might be because Kairanga was organic. Mr Crawshaw recalled Mr Homes carrying out some work for him at this time but does not recall seeing the spotting or sick plants he described in his evidence. There is no other report of issues at this time.

[1003] The following year, Pam Campbell, the canopy manager, had:

... noticed damage to the vines in about Spring 2010, while I was walking the rows in the orchard during bud-thinning or flowering. ... there were brown spots on the leaves and the vines looked like they'd been knocked around by wind. We thought it might be wind damage.

[1004] Ms Campbell's brief of evidence had said “October” but this was altered to “spring” when she gave her evidence. She said it was “September/October”, sometime around then. She further added that she thought the time lapse between when they found what they thought was the wind damage and when the test results came back seemed to be only two or three weeks. Ms Campbell's timeframe of spring (September/October) is consistent with a document in evidence at the hearing. This document sets out observations of symptoms at various locations. For Kairanga the document notes the infection as first being observed on 3 October 2010.

[1005] The damaged vines and leaves were in block C. This is a block that borders Mark Road at the front and a gully on one side. Trees on the gully side provided a wind break, but there was a gap where some trees had fallen down. It was “quite a big patch” (somewhere between six and 10 vines over a patch of two or three rows) and the damage was “very obvious”. She told Mr Crawshaw about it and they looked at the vines together. There were “brown spots” and they looked like they had been knocked around by the wind. They discussed putting up an artificial windbreak in that

gap. Ms Campbell did not remember seeing the same sort of damage to that extent at Kairanga before. If there had been any such similar damage she would have noticed it as she would have done something about it.

[1006] Ms Campbell's evidence is confirmed by a note Heather Pearson, a MAF investigator, made on 9 November 2010. Ms Pearson had earlier been informed by Mr Crawshaw that he had first seen symptoms on about 4 November 2010. In this note Ms Pearson records Mr Crawshaw as having spoken to Ms Campbell that day (9 November 2010), Ms Campbell having "reminded" him "that she had noticed the red, angular spotting on the leaves in Early October, before flowering" and he had thought it was possibly wind damage.

[1007] The first bee hives were delivered to Kairanga on 7 October 2010. At this point some of the flowers would have been open. Mr Crawshaw did not recall when artificial pollination took place. Based on an invoice for pollen dated 15 October 2010 he thought it might have been a week earlier or later than that. A week earlier than 15 October would be consistent with the arrival of the bees. Mr Crawshaw believed, but could not be sure, the bees would have been moved by 6 November 2010 when pollination had finished. He recalled that a swarm of bees was left behind. They were on F block of Kairanga.

[1008] On 6 November 2010 Mr Max telephoned Mr Crawshaw. Mr Max said he was across the road at Olympos. They were looking at some suspicious spots at Olympos and they asked if they could have a look at Kairanga. Mr Crawshaw confirmed they could. Mr Max's evidence was that he and other(s) went to blocks B and C (the blocks that border Mark Road). He did not think they walked the whole orchard because Mr Crawshaw was going to do that. He recalled that he saw predominantly leaf spotting and shoot dieback limited to one or two female vines.

[1009] Mr Crawshaw described what he saw at that time as being "quite different" to what he had seen before:

There was a lot more spotting ... and it filled several bays. There was also some dieback – blackened young shoots that were dying. I got quite a shock that there was clearly a disease there, which had not been on my radar as a problem prior to that day.

[1010] On 8 November 2010 Kairanga was declared RP2. Mr Taylor described the symptoms at RP2 during this 8-10 November period as “moderate and intermittently spread throughout the property of the blocks”. He regarded the symptoms at RP2 as “less aggressive” than RP1 and he did not see dieback or dead vines. Mr Manning and Mr Fullerton visited Kairanga on 12 November 2010 and noted, amongst other things, “severe leaf spots”, “loss of buds and fruitlets, dark canes and possibly some wilting of shoots” and “rapid increase in severity observed on return visit after 10 days”.

[1011] On 13 November 2010 Mr Max and Mr Limmer visited Kairanga and observed two orange cankers and leaders. Ms Froud was also present and a video was taken. At this stage Pam Campbell and others were cutting out the vines and putting them into large sealed bags. Ms Campbell said from the time she first noticed the patch, it “seemed to move very quickly”. She said they found “little bits in lots of areas” because once it was found they were looking for it. They started first with cutting out the vines in the original patch. Ms Froud’s notebook, probably made on 15 November 2010, recorded “Crawshaws-exudate-some white plus cankers out of canes”.

Other orchards

[1012] After visiting Olympos and Kairanga on 6 November 2010, Mr Max and others walked onto Mr Holmes’ orchard at 41 Mark Road. This orchard is behind Olympos. No symptoms were observed at this time.

[1013] On 8 November 2010 Ms Pearson was advised that an orchard manager had reported symptoms at an orchard 10-15 km from RP1 and RP2. The orchard owner was part of a syndicate that owned other orchards. Two of these orchards were visited and were found to have “leaf expressions”. On this basis they became RP3 and RP4. On 10 November 2010 RP5 was issued on another orchard in Te Puke on a similar basis. Thereafter RP notices were issued as and when reports of symptoms were made.

[1014] In this period Zespri was telephoning orchardists to see if anyone had symptoms of Psa. Mr Taylor’s team, which was carrying out the sampling and testing, worked out a plan and targeted orchards that had reported symptoms, as well as orchards identified as being of interest (for example, through tracing activities carried

out by MAF's incursion investigators that indicated they may share equipment and employees with symptomatic orchards).

[1015] At this time the testing process was time consuming and did not differentiate between different forms of Psa. False positives could also have occurred. It was not until December 2010 that the presence of two different pathovars of Psa were identified. One was the new virulent form of Psa (initially described as Psa-V) and the other was less virulent (initially described as Psa-LV). As Mr Judd described it:

The rapid spread of positive Psa test results implied that Psa had spread and was spreading uncontrollably, when in fact, as later identified, many of the orchards may only have been infected with Psa-LV.

RP1 or RP2 first?

[1016] The evidence was that RP1 and RP2 were the first two orchards to report symptoms. At this time the symptoms had advanced from the reports a few weeks earlier from their workers and it was clear there was a disease problem. No other orchard had reported symptoms when they had. And there is no evidence that any other orchard, that reported having symptoms soon after this, had more advanced symptoms than RP1 and RP2. The evidence of symptom reports is consistent with RP1 or RP2 being the initial source of the outbreak.

[1017] As counsel for the plaintiffs put it in closing (and accurately in my assessment of the evidence):

So when Your Honour hears the submission that was made yesterday, that there is no epicentre, that is a submission only, that is not something an MPI employee gave evidence to really support and it is not something that MPI's fact witnesses on the ground truly believed. Some said they didn't know whether there might be other ones, but that was the height of it and this is not a factual context ... where it can be said, well, look harder, there might be more data. Te Puke was swarming with people looking for Psa and these two orchards were the first.

[1018] The description of the symptoms identified initially at RP1 and RP2, which I have set out above, is not intended to set out every detail of the evidence about those visits and the observations made. It is intended to provide an overview only. This is because I consider it is now not possible to be certain about which of RP1 and RP2 was infected first. The evidence is consistent with either of them being the first (or,

putting it another way, it is reasonably possible on the evidence of observed symptoms, that either of them was infected first). This is for a number of reasons including:

- (a) How witnesses described the symptoms from the same visits varied. This may partly be because they were looking at different things and partly a matter of perspective.
- (b) It was apparent that some witnesses were confused about which days they had seen which symptoms. It seems, for example, that Mr Crawshaw's evidence of the symptoms he saw on 6 November 2010 was more likely to have been on 8 November 2010 when Kairanga was declared a restricted place.
- (c) The visit to Olympos on 6 November 2010 by Mr Max and others was more extensive than the visit to Kairanga that day. This was Mr Max's evidence and it is consistent with the way things had developed that day.
- (d) Although I accept Mr Taylor's evidence that, in the days of his surveying and sampling of the orchards, Olympos had the more extensive leaf spotting (which is also consistent with Mr Max's comments on the video taken of Olympos on 11 November 2010), that is a snap shot in time which needs to be considered with the other evidence before and after that snap shot.
- (e) The evidence is consistent that the symptoms at RP2 accelerated quickly after initially observed by Mr Max and others on 6 November 2010 and extensive cutting out was well underway by 13 November 2010 as the video taken that day shows.
- (f) The evidence concerns observed symptoms. Infection of vines occurs before the point at which the vines are displaying observable symptoms, the time between infection and observable symptoms depends on a number of factors including the inoculum level of the

infection, and there are epiphytic and endophytic stages which, at the two orchards, may have varied.

[1019] Overall the evidence is that the first obvious sign of a possible problem was identified first in RP2 (around early October 2010: “quite a big patch” of between six to ten vines with brown spots) followed by RP1 (on 21 October 2010: “a sick vine”). The disease spread rapidly at both orchards following artificial pollination. At RP2, symptoms accelerated quickly. Cankers were first observed at RP2. This was on 13 November 2010. The first report of cankers on RP1 was in February 2011.

The analysis of the spread

MAF pathway tracing report

[1020] MAF prepares pathway tracing reports in response to incursions of unwanted pests or pathogens into New Zealand. The purpose of a tracing report is to identify the possible pathways by which the pest/pathogen might have entered New Zealand and how it might have spread within the country after incursion. A pathway is a specific route by which an unwanted organism enters the country, how it gets onto the infected orchards and how it moves within and across orchards. Pathway identification allows MAF to create a plan for eradicating or controlling the disease and develop new tools for controlling the pathway in future to prevent similar incursions.

[1021] The Psa Pathway Report was presented to MAF’s response leadership team on 5 December 2011. It concluded “[t]he initial infection probably arose from a single point of introduction at or close to the area where the first infected vines were identified.” It elaborated on this topic as follows:

The pattern and timing of spread from the sites where Psa V was initially found also suggest that the disease arose from a single point of introduction. It spread from these vines by natural means (wind and rain) to adjacent orchards, and by the actions of people more widely. Human induced spread could include movement of kiwifruit cuttings or plant material, equipment movements or bacterial contamination on clothing or footwear.

Dr Beckett

[1022] Dr Beckett is an expert in epidemiology with particular strengths in biosecurity and disease modelling.⁵⁰⁰ He gave evidence about Psa based on his review of the literature. This included Rosanowski *et al* (2013) spatial analysis. This described an outbreak that commenced in spring at the start of the growing season (2010-11) with two subsequent waves in the growing seasons of 2011-2012 and 2012-2013. All but one of the orchards in the first season were located in the Te Puke region, with the remaining orchard close by in Tauranga East.

[1023] Dr Beckett considered this article in the context of reviewing a series of 70 KVH pictorial maps covering the period January 2011 to November 2012. These maps were created once the test had been developed to reliably differentiate Psa3 from Psa4 (also referred to as Pfm or Psa-LV). Dr Beckett considered these maps showed a picture of the Psa3 outbreak being confined initially to a small part of the Te Puke region, with aggressive spread amongst neighbouring orchards and others in close proximity. The disease then spread to other areas in Te Puke through spot outbreaks, and to other regions of the Bay of Plenty. Each of these spot outbreaks became a focal point of more aggressive local infections.

Robert Taylor's 2017 report

[1024] Robert Taylor and others at what was then the Ministry of Primary Industries (MPI) published a report in 2017 called “Strain characterisation of Psa isolates collected from kiwifruit orchards during the initial outbreak in the Bay of Plenty”. This report was based on retesting the samples collected at the beginning of the outbreak of disease after it was discovered there were two strains of Psa in the country: Psa3, which caused widespread damage to the industry; and Psa4, which caused only leaf spotting. The retesting had showed that the initial understanding that disease distribution was widespread was wrong. This was because Psa4 had likely been present in New Zealand for many years and was widely distributed throughout the country.

⁵⁰⁰ Epidemiology is concerned with the incidence and distribution of disease.

[1025] On the basis of the retesting analysis, the report found that most of the orchards that tested positive for Psa3 were clustered in Te Puke around RP1 and RP2. They appeared to radiate outwards from RP1 and RP2 in a zone of approximately 10 km by 20 km around those two orchards. These detections were likely the result of natural dispersal events such as wind-driven rain. The report identified some significant outliers (e.g. RP97⁵⁰¹ and RP23) that were over 20 km away from RP1 and RP2, which were detected in the first four weeks of the incursion response. It was unlikely they were spread naturally from RP1 and RP2. Spread to the outlying orchards was likely attributed to human-assisted movement (e.g. nursery stock, pollen, and equipment), but could have been due to separate introduction events from other sources. The report concluded that the tight cluster of Psa3 infected orchards and the nature of the spread supported previous views that the outbreak was a recent introduction.

Dynamic maps

[1026] Fraser Colegrave, an economist called by the plaintiffs, produced some dynamic maps based on the strain re-testing data used by Mr Taylor and MPI to prepare the strain re-testing report. These maps show the spread of Psa3 across orchards in Te Puke across the period studied in the strain testing report. It visually demonstrates the spread of Psa3 radiating out from RP1 and RP2.

Defendant's submissions on data

[1027] The defendant submits that the evidence does not support an epicentre theory at RP1 or RP2. He says the plaintiffs have not produced expert evidence to establish an epicentre. He says an epicentre theory is not supported by the data. This data shows that the geographical spread of Psa3 infection in the first few weeks of incursion presented significant outliers. Specifically, the defendant refers to:

- (a) RP13 (or the Hungerford orchard) which was the third orchard to begin displaying secondary symptoms. This was approximately 3.5 km from RP1 and RP2. MAF's tracing investigation could not establish a clear path of transmission from RP1 and RP2 to RP13.

⁵⁰¹ RP97 had tested negative from a sample taken on 14 November 2010 (symptoms were observed on less than one per cent of vines). It tested positive on 29 November 2010.

- (b) RP4 and RP23 were two orchards of five that, as at 15 November 2010, had samples taken that were later confirmed to be Psa3. These orchards were nine and six km away from RP1 and RP2 respectively.
- (c) By 21 November 2010 15 orchards had tested positive for Psa3. This showed a cluster of four orchards around RP13, a new cluster immediately north of RP1.
- (d) By 30 November 2010 28 orchards had tested positive for Psa3, one of which was approximately 20 km from RP1 and more than 10 km from any orchard known to be infected at that time.

My assessment of the evidence of spread

[1028] In my view the general pattern of the data is consistent with the epicentre theory. Some of the outliers referred to are less than 10 km from RP1 and RP2 and none of them are more than around 20 km. These outliers are consistent with human-assisted spread. The fact that MAF was unable to identify links to establish how that spread occurred does not alter the underlying pattern. That pattern is of the disease symptoms presenting first at Kairanga and Olympos and then radiating outwards to other orchards that were close by. This spread was consistent with a combination of natural and human assisted causes. As an infection developed in one location, that in turn became a focal point for further spread.

Conclusion on epicentre

[1029] I consider on the balance of probabilities that there was an epicentre for Psa3 at RP1/RP2. That is consistent with the epidemiology of Psa, that RP1 and RP2 were the first to report symptoms, and with the analysis of the spread. It was also the view of those involved in the field at the time, including the MAF investigators who reported that view in the Pathway Tracing Report. It is not possible to be certain which of RP1 or RP2 was infected first (infection occurs earlier than symptom expression and goes undetected). It is reasonably possible that it was RP1 based on the extent of leaf spotting observed on 8 November 2010 and the dieback observed in April if this

was caused by Psa3.⁵⁰² The same applies to Mr Holmes' observations about Kairanga in spring 2009, although this is a little less clear. It is reasonably possible that it was RP2 based on the first reports of symptoms at the two orchards and the evidence about the symptoms and their progression.

The anthers pathway from China to Kiwi Pollen

The background to the June 2009 consignment

[1030] In 2007 Kiwi Pollen was investigating importing pollen. The general thinking was that if pollen was available more cheaply, more people would use it in their orchards.

[1031] In May 2007 Kiwi Pollen and Kazu Sarui of Bexley Inc and Dr Qu entered into a heads of agreement relating to the import of pollen from China. Mr Sarui was a longstanding customer of Kiwi Pollen's pollen exported to Japan. Dr Qu was Mr Sarui's contact in China. Under this agreement Kiwi Pollen was to purchase 1000 kg of kiwifruit pollen from Bexley Inc, sourced from China. A portion of this would be hand collected and, subject to obtaining approval from MAF, a portion would be vacuum-collected (also known as aspirated pollen).⁵⁰³

[1032] At around the same time Kiwi Pollen was also investigating producing pollen in Chile. Kiwi Pollen imported a trial shipment of 2.5 kg of pollen from Chile which arrived in the country on 15 December 2008 and was released by MAF on 20 January 2009. On 28 March 2009 a second shipment of 26 kg of pollen arrived in New Zealand and was released to Kiwi Pollen the same day. This was Kiwi Pollen's first commercial shipment of imported pollen.

[1033] The June 2009 anthers consignment was the first shipment from China. That first shipment was also to be a trial of the supply chain, including the ability of the Chinese counterparts to produce viable pollen, the cool chain and the import process in general. Kiwi Pollen wanted to see if the idea was workable.

⁵⁰² Dr Vanneste and Mr Max do not think this was Psa3 but in my assessment this cannot be ruled out altogether.

⁵⁰³ It was also intended that Kiwi Pollen would provide production technology and knowhow and graftwood (to produce pollen) to China.

[1034] This first shipment from China was arranged by Mr Sarui. It is apparent from his email to Ms Hamlyn dated 6 June 2009 that the anthers were collected sometime in May 2009. The email does not say that it is anthers that had been collected. Nor does it say where the anthers had been collected from. Ms Hamlyn did not know at the time where in China they had come from.

[1035] She later learned this when she visited China in the second half of 2012. Ms Hamlyn visited China because of the speculation about China's involvement in the New Zealand outbreak. She visited three orchards with Mr Sarui and Dr Qu. They visited the following:

- (a) Orchard 1: located in the countryside, the topography of which is more flat than mountainous, near Zhouzhi.⁵⁰⁴ Zhouzhi is a small town in the Shaanxi province of China. Of the two Shaanxi orchards they visited, this one was the closest to Xi'an: the largest and capital city of Shaanxi. Zhouzhi is in the Xi'an prefecture of Shaanxi.
- (b) Orchard 2: located near Hanzhong. They drove there from Orchard 1. The drive possibly took around five hours. They drove through some hills or mountains to get there.
- (c) Orchard 3: this is an orchard in which Kiwi Pollen had an interest with Dr Qu and Mr Sarui. It is closest to Dujiangyan, a town near and to the northwest of the city of Chengdu in the province of Sichuan. This was a "very, very long way" southwest from Orchard 2. They travelled by overnight train.

[1036] As a result of the trip she learned the shipment of anthers had come from Orchard 1. She recalled it was the orchard closest to Xi'an. She said "I think there may have been, there was the possibility that there was product from number 2, but certainly there was product from number 1." That answer, which was given in

⁵⁰⁴ Zhouzhi is 47.5 km from Dandong, a town in Mei County (also known as Meixian) located in the Baoji prefecture of Shaanxi province. Mei County has an area of 863 km². Dandong is where the M7 sample, discussed later in the genetic evidence, was obtained from.

response to questioning from the defendant's counsel, was consistent with Ms Hamlyn's other evidence on the topic.

[1037] Given the reason for Ms Hamlyn's trip to China it would be surprising if she had not wanted to know where the anthers had come from. At around this time she also put some pins on a google map to show the locations of the three orchards they had been to, having discussed this with Mr Sarui. She did this because she wanted to know where she had been (all the signs were in Chinese and she had travelled a long way from Shanghai). This reinforces the likelihood that Ms Hamlyn was able to accurately recall that the anthers certainly came from Orchard 1, whether or not some also came from Orchard 2. I accept her evidence that some, probably all, of the anthers came from Orchard 1.

[1038] The cool chain of the anthers shipment from Orchard 1 was not ideal. Mr Sarui's email to Ms Hamlyn on 6 June 2009 advised the pollen was transported from the orchard to Shanghai which took about 42 hours from harvest. It was transported in styrofoam with blue ice but the condition was not good. Mr Sarui then stored it in his house for about two weeks, but the temperature was only negative 6 °C. He had then bought a larger and cooler freezer where the pollen was then stored at negative 16 °C.

[1039] Mr Sarui said that Dr Qu had advised the viability at the orchard was a minimum of 70 to 75 per cent.⁵⁰⁵ He said that when the pollen arrived Ms Hamlyn was to keep the pollen in a freezer and test the pollen's viability. He also said the orchard facilities were poor and it was planned to set up a drying facilities near the orchard to provide better ventilation and quality for next season.

[1040] The shipment arrived in New Zealand on 24 June 2009. It was released to Kiwi Pollen's freight forwarders on 30 June 2009.

⁵⁰⁵ The evidence did not address whether the viability of anthers could be tested and whether this would be different from the viability of pollen processed from them.

What did Kiwi Pollen do with the June 2009 consignment

Ms Hamlyn's account

[1041] Ms Hamlyn recalls the consignment arriving. It arrived in a large black plastic bag (typical of the rubbish bags available at New Zealand supermarkets). Inside the bag was a box that contained the anthers and a lot of screwed up paper. There would have been cold packs as well but Ms Hamlyn does not remember what they were like. She does remember that the packaging was unsophisticated.

[1042] She was surprised to receive anthers rather than processed pollen.⁵⁰⁶ Ms Hamlyn does not think she noticed at the time that the Chinese issued phytosanitary certificate identified the species as “*Actinidia arguta*.” Ms Hamlyn is sure she received *Actinidia deliciosa* anthers. She would have noticed if they had been *Actinidia arguta* anthers because they look quite different.

[1043] Ms Hamlyn put the box of anthers in the freezer. She does not remember if she did this immediately. She thinks she may have put it to one side to deal with later because she was busy with much more important things going on. Ms Hamlyn cannot recall how long the box stayed in the freezer. She does recall eventually cycloning the frozen anthers in the Matilda cyclone in the pollen room at Main Road.⁵⁰⁷ She does not recall anyone helping her with this task. Ms Hamlyn says she vaguely recalls getting from the anthers only about one or two cm of pollen in the bottom of a 250 g jar.

[1044] Ms Hamlyn does not remember testing the viability of the pollen produced but believes she did because that is something she would do. She does not remember the testing result other than that the pollen was poor quality and that she was not surprised by this. The pollen book does not record the testing result, so she either recorded the result somewhere else or she did not record it at all.

[1045] In her brief of evidence Ms Hamlyn said:

⁵⁰⁶ She is aware that anthers, also known as rough anthers, are traded around the world. She thinks Dr Qu must have thought this was she was expecting. Kiwi Pollen shipped cyclones to China so that Dr Qu would be able to remove the anthers from future imports.

⁵⁰⁷ The pollen room was a small room (around 4 m x 2 m) at Kiwi Pollen's premises at Main Road.

Again, I do not actually remember throwing the pollen out, but I expect that is what would have happened to it. It was low quality, so we were not able to sell it, and it was an inconsequential amount. My best guess is that it would have been thrown out during the periodic defrosting and cleaning of our freezers.

[1046] Ms Hamlyn does not recall what she did with the anther waste produced from the cyclone. The waste would have been similar to the volume of anthers that went into the cyclone (that is, approximately 4.5 kg, or possibly less than this depending on whether the 4.5 kg weight of the consignment accounted for the packaging). In her brief of evidence she said she “expect[s]” she would have put the waste in a large cardboard box with a plastic liner that is used as a rubbish bin in the pollen room. She also expects she would have then disposed of it into one of three 44 gallon drums they have outside the Main Road premises. The rubbish drums outside the Main Road premises have a plastic liner and the lid is metal, cut from the top of the drum, that fits on the top. The drums were picked up weekly. All sorts of debris from the operations at Main Road, including from the office, would go into the drum.

Reliability assessment

[1047] Ms Hamlyn’s account was challenged by the plaintiffs. It is therefore necessary to make some findings about this. Before doing so, I accept the plaintiffs’ submission that Ms Hamlyn’s evidence, and that of her husband Graeme Crawshaw, must be approached with caution. They cooperated with the plaintiffs belatedly, reluctantly and under subpoena.

[1048] They were reluctant witnesses for understandable reasons. They were under a great deal of pressure at the time of the outbreak, with Te Puke (where they lived) and the kiwifruit industry (of which they are part) facing ruin, when suspicion fell on their product as the cause. Not only was their kiwifruit orchard being destroyed and their pollen business suspended, people in their town and industry blamed them even though, if it was their product that had caused the outbreak, they had obtained that product under a permit approved by MAF. MAF posted security guards outside their gates because they were worried about their safety. At least once a week Mr Crawshaw would be asked by someone if he was okay because they had heard he had been

assaulted. This sort of pressure undoubtedly contributed to the statements that Ms Hamlyn gave to the MAF investigator at the time.⁵⁰⁸

[1049] Ms Hamlyn and Mr Crawshaw, as the principals of the business whose imported Chinese product is at issue, remain at the centre of this case. Ms Hamlyn agreed with a question from the defendant's counsel that her strong preference was to be anywhere but in court. In Mr Crawshaw's words: "Jill and I are central witnesses in a very large Court case making history in New Zealand, that's a nerve-wracking experience."

[1050] When recalling events that happened under that sort of stress it is almost inevitable that the recall will be unreliable. Memory is rarely perfect at the best of times. In treating the reliability of Ms Hamlyn and Mr Crawshaw's evidence with caution, I emphasise that I do not attribute to them any dishonesty. My assessment of both of them was that they were trying to do their best in the very difficult circumstances in which they found themselves. Inevitably, however, some things were remembered or suggested as they wished them to be, rather than perhaps as they were. Other matters were no longer remembered at all (again, understandably).

When were the anthers cycloned

[1051] As the June 2009 anthers consignment was released for dispatch on 30 June 2009, it must have been received by Kiwi Pollen that day or a few days afterwards. It is not challenged that it was Ms Hamlyn that received the consignment and dealt with it. She was in charge of Kiwi Pollen's business. She employed a pollen room manager, but in June/July 2009 she was between managers. Jan Mitchell, who was employed from around 1995 until about March 2009, had left.⁵⁰⁹ Amanda Lyons was employed by Kiwi Pollen in August 2009. Consistent with this timing, Ms Mitchell does not

⁵⁰⁸ She initially told MAF that the second consignment of Chinese pollen had been thrown out and later corrected this. This and other things led a MAF investigator to comment in an internal email: "In my many conversations with Jill Hamlyn (Kiwi Pollen), there was **not** one occasion where the information Jill told me was consistent with previous correspondence...". Ms Hamlyn also did not mention Chinese pollen in a Kiwi Pollen press release about the outbreak issued on 9 November 2010.

⁵⁰⁹ One of the last things she recalls doing is calling MAF, on Ms Hamlyn's instructions, to get them to release pollen being imported from Chile which was held up at the border. She recalls that she had left Kiwi Pollen before the Chilean pollen arrived.

recall any Chinese pollen and Ms Lyons recalls only the one shipment of a small amount of Chinese pollen. It is likely Ms Lyons recollection relates to the second shipment received shortly after it was released by MAF on 16 June 2010.⁵¹⁰ Ms Mitchell and Ms Lyons' evidence confirms that, when the consignment would have been received, the pollen room was at the Main Road premises.⁵¹¹

[1052] The first issue is whether there was much, if any, delay between Ms Hamlyn opening the consignment and putting it in the freezer. In my view, any such delay was likely to be short. A long delay would be inconsistent with the need to freeze pollen to preserve its viability, the advice from Mr Sarui to freeze the pollen when it arrived, and how little time it would take to put the consignment into the freezer. A long delay would also be inconsistent with Ms Hamlyn's practices to save all pollen which is a topic to be discussed shortly.

[1053] The next issue is when the cycloning took place. Ms Hamlyn was pressed by counsel on both sides about her recollection of when this occurred. She was clear she could not remember. When asked by counsel for the defendant, she said she remembered that it was in winter 2009. When re-examined by counsel for the plaintiff, she agreed she simply could not remember.

[1054] It is possible she cycloned the anthers sometime in winter after receiving it in early July and putting it in the freezer. However it is more likely that it was later than July, as the reason she had put it in the freezer when it arrived was because she had "much more important things going on at that time". Her signed brief of evidence had said she "eventually" cycloned the frozen anthers. The suggestion that it was winter came for the first time in answer to the defendant's questions. The real position, as she also said, was that she did not actually remember. The domestic season in the

⁵¹⁰ Ms Lyons recalls Ms Hamlyn receiving an envelope that had been cut open by MAF and taped back up. The envelope had roughly 10-20 g of dry, unfrozen, pollen. She remembers testing it and that it was dead. She does not remember what happened to it after this. She says she would have either been instructed to throw it away or put it back in the freezer until Ms Hamlyn decided what to do with it.

⁵¹¹ Ms Mitchell worked in the pollen room at Main Road during her time. Ms Lyons started at Main Road in August 2010. She continued in this role until Kiwi Pollen moved to premises at Te Matai Road at which time she moved into an accounts role. This was after the Psa outbreak. She has continued in this role to the present day.

pollen room was from September to November and was at its peak in November.⁵¹² It is quite possible that the anthers were cycloned in the lead up to or during this period. Exactly when it occurred is an unknown.

What happened to the pollen

[1055] The next question is what happened to the pollen. Ms Hamlyn recalled the viability was low. She did not recall what she did with it but her best guess was she had thrown it out because the amount was small and she could not sell it. I do not accept her best guess is a reliable one. It is contradicted by other evidence that all pollen, even if it was dead, was kept. It is also contradicted by other evidence that Mr Crawshaw used low viability pollen when experimenting with his pollen equipment.

[1056] As to the keeping of all pollen:

- (a) Ms Mitchell said pollen needed to be 70 per cent viable to be sold commercially. If it did not meet this threshold it was not thrown out. It was marked as having low viability and put into one of the freezers. It would usually end up in one of the old freezers in the shed.
- (b) Ms Mitchell also explained that one of her roles was to measure the pollen from 350 g jars into the other unit sizes. This sometimes led to spillages. At the end of each day there would also be a small amount of left over pollen. Ms Mitchell would use a cyclone machine (called Matilda), which was like a large vacuum cleaner, to suck up the pollen that accumulated in the pollen room. The pollen would go into a jar and be put in the freezer with a label to identify it as leftover pollen. The jar would go into the freezer. When the jar was full she would test its viability.
- (c) Mr Moore, an orchardist from whom the Main Road pollen room was leased, confirmed Ms Mitchell's evidence about the use of Matilda for

⁵¹² The domestic season ran from September to November. In this period Kiwi Pollen collected the kiwifruit flowers, milled them and then sold and delivered the pollen to growers. The export season was from January/February until March/April.

left over pollen. He was a regular visitor to the pollen room. He remembered there being a lot of pollen dust in the pollen room and that Ms Mitchell would wear a mask. Some pollen would end up on the bench and floor. It was too valuable to waste, so it would be swept up and put through the cyclone machine in the pollen room, labelled and put in the freezer.

- (d) Ms Lyons confirmed the evidence that spilled pollen and pollen that got into the air would be retrieved with the cyclone, Matilda. The practice was to retrieve all pollen because it was so valuable. Ms Hamlyn's instructions "would be to keep every speck of pollen, every bit, because it was so valuable." If it was literally a speck she would wipe the bench. But if there was "a dusty film" she would use the Matilda machine. The cyclone would be used very often on a busy day (every 15-20 minutes). Matilda had a jar attached to it. The jar would be labelled Matilda for general pollen or it would have a green sticker if it was organic pollen.
- (e) Ms Lyons said re-cycloned, low viability and dead pollen all went into a freezer together.⁵¹³ At this time the dead pollen was not included in the stock takes but later this changed.
- (f) Ms Lyons said any small amounts left over from measuring pollen into jars would also be kept as it could be used for exporting 10 ml vials.
- (g) Ms Lyons was also asked about disposing pollen as follows:

Q. And on whose instruction were you keeping that pollen back in 2010 when you were at Main Road?

A. Jill's.

Q. What was her instruction in terms of lower viability pollen, specifically?

⁵¹³ Kiwi Pollen had re-cycloned pollen. Mr Crawshaw explained that, after the milling of pollen, the dried anthers that have fallen through the sieve during milling through the cyclone machine are vacuumed and kept in a container. Kiwi Pollen discovered that more pollen could be extracted if they were put through the cyclone the following day. This is called re-cycloned pollen. Dead pollen is pollen with zero viability.

A. The only instruction given was just to keep everything. I never disposed of anything unless I was specifically instructed to dispose of anything.

Q. Which would happen how often?

A. Never.

- (h) Mr Crawshaw did not disagree with Ms Lyons' evidence that Kiwi Pollen keeps re-cycloned and low viability pollen in the freezers. He said Ms Hamlyn was commercially sensible so she must have had a reason for this.
- (i) Lastly, the second shipment of pollen from China, given border clearance on 16 June 2010, arrived damaged and was tested by Ms Lyons and found to be "dead". There was Chinese pollen in the freezer on 8 November 2010 when a list of pollen was made in the pollen book. It was also there when MAF investigators seized it. This is understood to be the "dead" pollen from this shipment.

[1057] As to the evidence that Mr Crawshaw used low viability pollen in his experiments, he accepted he sometimes used the pollen to test his equipment. He would get Ms Hamlyn's clearance before doing so, as she was very particular about the pollen and would know exactly what he could take. He could not take the commercial pollen stocks without talking to Ms Hamlyn. Sometimes he was allowed to use commercially viable pollen and sometimes he was allowed low viability pollen. He was able to experiment with the low or no viability pollen without her knowledge. Mr Moore, who had a long association with Mr Crawshaw, thought it possible that some of the experiments he and Mr Crawshaw did with artificial pollination equipment may have used pollen that was not very viable.

[1058] In light of this evidence I consider it highly likely that the pollen from the June 2009 shipment was kept.

What happened to the anthers

[1059] The next question is whether there is reliable evidence about the disposal of the anther waste after they had been cycloned by Ms Hamlyn. As noted Ms Hamlyn does not recall what she did with them. She could only say what she expected she would have done, which was to put them in the sealed rubbish bins outside the Main Road premises.

[1060] Ms Hamlyn was tested on this evidence. In questioning from the plaintiffs' counsel she agreed that the Main Road premises were not generally used for processing anthers, this was a one-off, and so it was unusual to have organic waste of that kind at those premises. She considered it was "extremely unlikely" that the anthers waste would have been taken to the bank at Kairanga where Mr Crawshaw disposed organic waste because this was a long way from the Main Road premises.

[1061] She also rejected the suggestion the anthers may have been thrown across Mr Moore's orchard. She said they were an industrial business renting a building from a landowner who would not have appreciated it if they had tipped their organic waste over his property. They also had egg waste from their organic egg production business and they certainly did not put that waste over his property. She rejected the suggestion that it would have been natural to throw the anthers onto a kiwifruit orchard.

[1062] When asked what Kiwi Pollen had done with the waste when they milled at Mr Moore's property 25 years ago, she said:

I really can't remember but I don't think we moved the waste from his property. I think we might have put it on his property. It's like bits of flowers. It was like compost.

[1063] She said these practices stopped with "Europe Gap and all sorts of other compliance matters coming in."

[1064] When Mr Crawshaw was first asked about what they did with waste, he said that in the season prior to the Psa outbreak a truck used to transport the plant waste from milling pollen to a composting facility at Paengaroa. They did not put the waste

on their orchard because it was not certified organic product so they would risk losing their organic status.

[1065] As to when Kiwi Pollen carried out the milling at Main Road, Mr Crawshaw did not recall putting the organic waste on Mr Moore's orchard. He said:

I don't know if it was spread there or not.

And it wouldn't surprise me if it was spread there. I just don't recall that happening. It was a long time ago that we actually did any milling at the Main Road site.

[1066] There was evidence of plant waste in a pile outside the Te Matai Road shed. Soon after the Psa outbreak, Mr West made several calls about this because he was concerned about the possibility it contained Psa and the wind could be contributing to its spread. Mr Crawshaw's evidence is that this was waste from the milled flowers and it was piled outside the shed at Te Matai Road only after a restricted place had been declared at Kairanga. He said this waste was all from November. He said this was because that is the only month flowers are open, and that is when the male flowers are picked for their pollen.

[1067] Mr Crawshaw was reminded that, when interviewed by a MAF investigator following the outbreak, he had said that the organic waste for composting had been dumped down the bank at Kairanga in previous years. Having been reminded of that, he agreed that had been done. He said the flower waste heated up (like lawn clippings) and then, after several months, it disappeared entirely because it was all vegetable matter. He had also told the investigator about the waste going on a truck to Paengaroa when it was full. Having been reminded of that, he said he could not remember whether these were different practices in different years or whether they used both methods for disposing of the waste in any year.

[1068] From this evidence it is unclear what happened to the anthers waste. The best that can be said is that Ms Hamlyn might have put the anthers waste in the bin, but it is also possible it ended up somewhere else. It is clear that Kiwi Pollen had disposed of some milling waste by allowing it to return to the ground from time to time at least. It was not a large quantity and "bits of flowers" would not look amiss on the site (it is

unclear whether that would be so with egg waste) until such time as natural processes subsumed it.⁵¹⁴

Kiwifruit plant material and pollen as a vector for Psa3

[1069] The next question is whether the pollen or the anther waste could have contained Psa3. There are three parts to this. First, whether pollen and/or anthers can be a vector for Psa. Secondly, whether Psa could have survived in the June 2009 anthers consignment. Thirdly, what is known about the relationship between Shaanxi Psa3 and the New Zealand Psa3 strain. This third part is the subject of expert genetic evidence which is discussed later.

[1070] As to the first part, I am satisfied the evidence has established that anthers and pollen can contain Psa3 (even though the anthers and pollen came from hand-collected closed flower buds); that Psa3 can survive the commercial milling process; that it can survive being frozen and stored; and that anthers or pollen containing Psa3 can infect kiwifruit plants through entering natural openings or lesions. This includes infection to the plant during artificial pollination. The defendant's closing submissions did not contend otherwise.

[1071] The evidence about this includes:

- (a) Psa is a pathogen known to be associated with kiwifruit plant material. It was therefore included in the *Actinidia* schedules to the nursery stock IHS (which covered whole plants or parts of plants imported for growing purposes, e.g. cuttings, scions, budwoods, marcots, off-shoots, root divisions, bulbs, corms, tubers and rhizomes) and the seeds for sowing IHS.
- (b) The general characteristics of Psa: namely that it is a robust bacteria, which can be spread by air, water or by being carried on inert material,

⁵¹⁴ The wind/heat caused decomposition.

which survives the longest when associated with kiwifruit plant material, and which enters the plant through natural points or lesions.⁵¹⁵

- (c) The fact that commercially milled pollen will contain flower parts⁵¹⁶ and tests conducted by Mr Taylor, a MAF senior scientist, in 2013 of the commercial pollen milling process confirmed viable Psa3 from samples of the plant material and pollen at every stage of the process.
- (d) Dr Everett's evidence based on scientific principles about how bacteria would be associated with the anthers that produce pollen, that bacteria is preserved by freezing it and the likely prospect that applying Psa contaminated pollen to a host plant would infect the host plant.
- (e) The published work of Vanneste *et al* (2010) and (2011), Stefani and Giovanardi (2011), Tontou *et al* (2014) and Kim *et al* (2016).⁵¹⁷
- (f) Mr Balestra's view that "it has been definitively established that kiwifruit pollen infected with Psa-V can cause infection in uninfected vines".
- (g) Dr Vanneste's evidence, including "if you have some pollen with Psa and you spray through the machine we've seen because of the time you have those plants that are susceptible and the environment is conducive, yes, you would get infection."

⁵¹⁵ As described, for example, by Mr Max, a Zespri employee with a degree in horticulture and extensive experience in responding to both the Italian and New Zealand outbreaks. Evidence to similar effect came from all the expert sciences working in Psa. Dr Vanneste did say at one point of his evidence that *pseudomonas syringae* is a "gram negative bacteria" which is "fragile" if it does not form a "biofilm". In other words, it is fragile if it does not have the conditions around it to survive.

⁵¹⁶ The plaintiffs called evidence from David Black who manages Seeka's pollen production operation to explain this process. Everyone in the industry uses broadly the same method.

⁵¹⁷ For example, Kim *et al* states at 550: "The completion of the Koch's postulates strongly supported our hypothesis that the contaminated pollen to Psa3 caused the 2014 canker epidemics in Jeju Island. Many previous studies in other countries also support our conclusion about the possibility of Psa3-contaminated pollens being an inoculum source for canker (Gallelli *et al.*, 2011; Stefani and Giovanardi, 2012; Vanneste *et al.*, 2011). The results of this study indicate that the main cause of Psa3 epidemics in Korea might be through the infected kiwifruit seedlings and contaminated pollens from outside. Therefore, in order to prevent additional introduction of Psa3 into Korea, Psa3 must be specified as the quarantine pathogen, through which the import of infected kiwifruit seedlings or contaminated pollens must be prohibited."

- (h) Mr Taylor's testing of New Zealand pollen that had been intended for the 2010 season, which detected Psa4 in 94 per cent.⁵¹⁸
- (i) Dr Poulter's team has isolated viable Psa3 from New Zealand commercial pollen collected in New Zealand between 2011 and 2016.⁵¹⁹
- (j) The fact that no pollen imports have been permitted into New Zealand since the incursion in November 2010.
- (k) The widely held view, from those working in the Psa area, that Japanese and Korean Psa4 has come from New Zealand imported pollen.

[1072] As to the second part, whether Psa could have survived in the June 2009 anthers consignment, it is important to distinguish between the viability of pollen and Psa3 survivability. The condition in which the anthers travelled and arrived at Kiwi Pollen, as described in the email to Ms Hamlyn, would have likely affected the viability of the pollen to some extent. Ms Hamlyn's evidence that the pollen from the consignment was of low viability was not challenged (there was no basis on which the plaintiffs could do so). But this is different from Psa3 survivability in the anthers and when pollen is extracted from them.

[1073] Relying on aspects of Dr Vanneste's evidence, the defendant submits that Psa is fragile. This is in the sense that, to survive, it requires either conditions favourable to multiply or biofilm to protect it.⁵²⁰ To multiply it needs a carbon source, nitrogen source and water. Without these conditions, it dies. The defendant also submits, again relying on Dr Vanneste's evidence, that pollen is not a conducive environment for survival.

⁵¹⁸ The tests in use at the time they were first tested could not distinguish between the different Psa biovars. Once the test to do this had been developed, the samples were retested and found not to be Psa3.

⁵¹⁹ From the 2011 samples his team isolated more than 10,000 colonies of Psa3 per gram of pollen.

⁵²⁰ When bacteria grow and form a colony, they usually produce some compounds such as exopolysaccharides, which surround and protect the bacterial cells and them to adhere to different surfaces. These colonies embedded in exopolysaccharides (sugars) are called biofilm.

[1074] As a preliminary point I note David Black's evidence. He is a pollen production manager. He said that healthier flowers give better quality pollen but the health of the plant was unlikely to affect the quantity of pollen produced. He calculated that 4.5 kg of dried anthers would yield 1 kg of pollen. Assuming, as appears to be the case, that the 4.5 kg weight of the June 2009 anthers consignment included the weight of packaging, the pollen extracted from the anthers would have been less than this.

[1075] Next I note that Dr Vanneste's evidence actually confirms that Psa can survive in pollen, through heat and on hard surfaces. He starts by saying Psa3 does not survive for "an extended period" in kiwifruit pollen. He goes on to explain that:

- (a) Based on his experiments, Psa3 stored in *unfrozen* pollen would be unlikely to survive "for longer than a couple of months" (emphasis added).
- (b) *Frozen* Psa bacteria cannot multiply, so its concentration when frozen does not increase. However, Psa3 bacteria does survive in a dormant state if frozen. To preserve it in the laboratory he freezes it at negative 80 °C and "if it consistently frozen at -20°C bacteria survive for a number of years" (and longer at negative 80 °C) (emphasis added).

[1076] As to heat, Dr Vanneste notes that in commercial milling the anthers are dried at 30 °C for between 18-20 hours. In his experiments Psa died in less than one hour when Psa3 was exposed to heat at 35 °C. However, Mr Taylor's evidence of specific testing of the commercial pollen milling process in 2013, which confirmed viable Psa3 from samples of the plant material and pollen at every stage of the process, is to be preferred.

[1077] Dr Vanneste also says that Psa survivability on non-plant surfaces "is not very good." He went on to explain that he conducted tests in his laboratory that found that survival of populations below 106 cfu was limited to "a few hours." He said that if any machinery had been cleaned, cross-contamination is unlikely. Spread on pruning equipment appears on MAF's Psa data sheet from 2004.

[1078] As to anthers debris left in a pile or flower dump, Dr Vanneste said from his experiments Psa could not survive for “more than a few days”. His reasons for this were partly that the bacteria would be hindered by the presence of other bacteria and partly because of the heat from combustion. They did not apply if the debris was blown about in the wind. He was asked what he would say if someone took a bunch of finely cut up plant material infected with Psa and threw it out the door beside a kiwifruit orchard. He said “that’s definitely not something that I would recommend.” I also note that the survivability of Psa3 in live anthers is not challenged. Anthers are plant material and, as such, provide the conditions for its survival. Ms Hamlyn did not say that when the anthers had arrived they had gone off. Her recollection is that she cycloned them and obtained low viability (not dead) pollen.

[1079] Mr Balestra’s evidence from published studies was that Psa “overwinters readily in leaf litter and pruning debris, representing a potential inoculum source for infection of new spring growth”. Dr Mazzaglia, who has a doctorate in plant pathology and has special expertise in the study of diseases of kiwifruit, agreed with Mr Balestra’s evidence. Finally, Dr Vanneste’s cautiousness about what could be taken from the Tontou *et al* (2014) study was because of contamination risks.⁵²¹ His evidence about this was:

- Q. If it is, you mentioned bringing in a bin of old leaves, I think just before, that would be a contamination risk that would be controllable more too wouldn’t it?
- A. Yeah, that’s one of the things I would hope *Tontou* would have said to the orchardist, okay, don’t do this, this, this, this and that please and you know.
- Q. And the leaf one is because the plant material, the leaves –
- A. Any plant material, plant material is really the major risks to transfer Psa from one orchard to the next.
- Q. And you’d see the leaves being a risk because what they could blow around once dumped?
- A. Because leaves gets, yes, you have fragments of leaves in most of the machinery, you get fragments of leaves in yeah, in some of the equipment people use and it is easy to overlook in a corner of a bin, a

⁵²¹ R Tontou, D Giovanardi, E Stefani “Pollen as a possible pathway for the dissemination of *Pseudomonas syringae* pv. *Actinidiae* and bacterial canker of kiwifruit” *Phytopathologia Mediterranea* 53 [*Tontou et al* (2014)]: 333-339.

couple of fragments of leaves and those fragments can carry inoculums, little drop of extradite would be actually quite, yeah, yeah.

Q. Sure and then carried on a boot if someone stands on it or lying around?

A. Yeah, yeah, so all that could be.

[1080] He also said the orchard at which the Tontou *et al* (2014) study was carried out may have been contaminated by other orchards. He went on to say the nearest orchard was 100 km away.

[1081] Accordingly, I am satisfied that, if there was Psa3 in the anthers when they left Orchard 1 in Shaanxi it is probable it survived the shipping to Kiwi Pollen and the cycloning carried out by Ms Hamlyn. It is also probable the Psa3 would survive in the pollen if it was frozen, and when it was unfrozen for whatever use to which it is put. It is also probable the Psa3 would survive in the anther debris, at least for a few days, if that debris was put somewhere on the ground outside the pollen room or anywhere else.

[1082] As mentioned, what is known about the relationship between Shaanxi Psa3 and the New Zealand Psa3 strain is the subject of expert genetic evidence which is discussed later.

Infection opportunities from Kiwi Pollen to RP1/RP2

The range of possibilities

[1083] The next question is whether there were any opportunities for the pollen or anther waste to have infected RP1 and/or RP2, if they contained Psa3. The possibilities raised by the evidence are:

- (a) The pollen was applied to RP1 in or after spring 2009 as part of Kiwi Pollen's experiments.
- (b) The pollen was bulked up with other pollen and applied to RP1 in spring 2010.

- (c) The pollen contaminated other pollen that was used to pollinate RP1 in spring 2010.
- (d) The pollen was used on RP2 as part of Kiwi Pollen's experiments.
- (e) The pollen was bulked up with other pollen and applied to RP2 in spring 2009 or in spring 2010.
- (f) The pollen contaminated other pollen that was applied to RP2 in or after spring 2009 or in spring 2010.
- (g) The anther debris contaminated equipment that was used on RP1 or RP2.
- (h) The pollen or the anther debris otherwise contaminated RP1 or RP2.

[1084] I consider these possibilities but note that the plaintiffs do not seek to prove, on the balance of probabilities, that any particular one of these was the cause. Rather they seek to establish there is a myriad of ways that Psa3, if in the June 2009 anthers consignment, could have infected RP1 or RP2.

First possibility: RP1: pollen experiments in or after spring 2009

[1085] Kiwi Pollen had a business developing, building and selling pollen application equipment. Mr Crawshaw was involved in this. He also involved Mr Moore and another person (not relevant for present purposes). The equipment he developed was explained as follows:

- (a) A two-stroke duster: This was built from a leaf blower designed for moving leaves off a pathway. A machine was developed to go on the top. This was not very accurate with where it sprayed pollen.
- (b) A mini-duster: A hand-held mini-duster which uses dry pollen. This has a small fan that provides airflow for the release of the pollen. This was an efficient method for applying pollen.

- (c) A quad bike pollen applicator: This was developed in 2008 or 2009. It involved mounting mini-dusters on quad bikes.

[1086] Mr Crawshaw would test this equipment with pollen. It is clear from his own evidence that he used dead or low viability pollen for this. This is because:

- (a) As noted above, he had access to dead or low viability pollen, whereas commercially viable pollen was valuable and needed Ms Hamlyn's permission;
- (b) Mr Crawshaw said that in testing the mini-duster he found that dead or low viability pollen would not flow through the mini-duster. When asked to be more specific about this, he said he thought it jammed at under 10 per cent but did not know whether there was a level above 10 per cent where it also jammed.
- (c) Mr Crawshaw said the two-stroke duster had a different metering device to the mini-duster, which meant that re-cycloned pollen could go through this.
- (d) Mr Crawshaw said he did not know if low viability pollen could go through the two-stroke duster but the reliability of that statement is doubtful given (a), (b) and (c).

[1087] Mr Crawshaw said his tests were conducted outside the Te Matai Road milling premises. Those premises are in close proximity to Olympos. Further, there is evidence that Mr Crawshaw conducted his equipment tests more widely than that. Specifically:

- (a) Mr Crawshaw accepted it was possible they also experimented on Mr Moore's orchard. He did not recall but if Mr Moore had said this then he would not disagree.
- (b) Mr Moore gave evidence that experiments with the equipment did take place on his orchard at Main Road. Mr Moore explained that Mr

Crawshaw managed his orchard for about 10 years and Kiwi Pollen leased the Main Road building from him for 17 years. He knew Ms Hamlyn and Mr Crawshaw well through this, and the work he did for them which included servicing the Matilda cyclone and helping with setting up the quad bike applicator. Mr Moore said this applicator was used and tested at his orchard, on Mr Crawshaw's orchard and also at Olympos.

[1088] There is also evidence that Kiwi Pollen carried out pollination experiments more broadly:

- (a) Mr Moore said that Mr Crawshaw and Ms Hamlyn used his orchard for a wide range of pollination experiments. For example, one year they cut out all of the males and did total artificial pollination on the orchard. Another year they experimented by doing one pass of artificial pollination on some rows, two passes on another and then three on others. When these experiments were carried out they put plastic bags on the female flowers to stop them being pollinated by bees.
- (b) Ms Mitchell said that during her time at Kiwi Pollen (1995 until about March 2009) she was aware that Mr Crawshaw did experiments on Mr Moore's orchard. She saw plastic bags put around a flower and understood this was testing artificial pollination. She would see Mr Crawshaw come into the pollen room during the week, know he had been there or in the shed in the weekend (because he would leave things out and he sometimes forgot to reset the alarm on the pollen room) and she would also hear Mr Crawshaw and Mr Moore working on pollen applicators outside or in the shed.
- (c) Peter West gave evidence that Kiwi Pollen experimented on their orchard year in and year out. He knew this because he would see the bags on the flowers. Initially it was to see how the pollen went on Hort16A (when Kairanga only had Hayward). It continued after this

and, because it did not affect Olympos, they let Mr Crawshaw and Ms Hamlyn come and go as they please.

- (d) Gail West gave similar evidence. Many years ago she had worked at Kiwi Pollen. She was also familiar with pollen experiments from her present role as a laboratory assistant.

[1089] The defendant submits Mr and Mrs West's evidence is unreliable. It is said that Mr West does not have direct knowledge of the experiments and Mrs West's evidence is affected by her clear view that Kiwi Pollen caused the incursion. Mr West is no longer an orchardist as a result of Psa. Mrs West is said to have embellished her account of the experiments from what she had told the MAF investigator originally. Her description of where the experiments were conducted is also said to be inconsistent with where the outbreak later occurred.

[1090] However Mr West did have direct knowledge in that he said he saw the plastic bags on the flowers. It is certainly the case that Mrs West considers Kiwi Pollen was responsible for the incursion and she has had that view almost from the outset. Mrs West undoubtedly had mixed and complex emotions about some matters, for example whether she was angry with Kiwi Pollen (a question she found very difficult to answer). Mr West believed Mr Crawshaw had deliberately hidden the worst of the symptoms on RP2 from him and MAF and this is not borne out by the evidence as a whole. Nevertheless, my overall assessment is that Mr and Mrs West were straight forward witnesses who gave their evidence as they recalled it. They are also not claimants in this proceeding.

[1091] Importantly, the reliability of their recollections about the experiments, is to some extent supported by Mr Moore and Ms Mitchell's evidence of experiments on Mr Moore's orchard. Neither of them had any reason to make up their evidence about this (Mr Moore, for example, still regards Mr Crawshaw and Ms Hamlyn as friends). Mr Moore's enquiring nature and interest in the experiments supports the reliability of his account. If experiments were carried out at Mr Moore's orchard it is just as likely they were carried out at Olympos. It was the neighbouring orchard to Kairanga so ready access was available. Additionally, the general attitude of orchardists at that

time was to allow each other access to their orchards and permission was not required for this. This was the approach Mr West had to Mr Crawshaw's access to his property. Experiments in one place at Olympos one year does not mean they did not take place in another place at Olympos in another year.

[1092] It does seem to be the case that these experiments involving plastic bags over flowers had taken place some years earlier than spring 2009. However experiments of this kind in earlier years at Olympos support the possibility that Mr Crawshaw tested his equipment at Olympos in later years. According to Mr Crawshaw, the quad bike was developed in 2008 and 2009. According to Mr Moore, it was when the quad bike applicator was being developed that it was tested at Kairanga, Olympos and his orchard.

[1093] Lastly, for reasons already discussed, Ms Hamlyn's responses to the MAF investigation about the experiments need to be viewed with caution. She was also not the one directly involved in the equipment experiments and, as she said to the MAF investigator, she had been reluctant to answer MAF questions about this because Kiwi Pollen was being blamed. Additionally, when asked by a MAF investigator on 10 November 2010 about the two Chinese pollen consignments, the investigator recorded the following:

I didn't get a clear answer on whether it had been applied in the field at all, which makes me suspect the answer is 'yes'. She only repeated a reference to it not being used commercially or sold.

[1094] In summary, there is a reasonable basis in the evidence to support the first possibility. The pollen extracted from the anthers may have been applied directly to Olympos when Mr Crawshaw was experimenting with his equipment, particularly the quad bike applicator, which was the newest development at that time.

Second possibility: RP1: pollen bulked with other pollen and applied in spring 2010

[1095] During both Ms Mitchell and Ms Lyon's time, pollen would be delivered overnight and placed in the freezers outside the pollen room. It would come in jars on trays. They would test the pollen's viability (around nine or 10 jars per tray) and measure and adjust the pollen jars into various sizes for sale. Specifically:

- (a) Ms Mitchell said the pollen came in 350 g jars and she would weigh the pollen into whatever unit was required as instructed by Ms Hamlyn. This could be 20 g vials, or 100 or 250 g jars. This was done using a contraption that Mr Crawshaw had made that had a funnel on it.

- (b) Ms Lyons said the pollen came in 250 g jars and it was part of her role to adjust the weight of the jars to ensure there was 250 g in each jar. Generally there would be some pollen left over and this would go towards making up 100 g jars that they sometimes got orders for. Any small amounts left over would also be kept as it could be used for exporting 10 ml vials. The pollen was moved from jar to jar by scooping it out with a spoon and pouring it through a funnel into a jar underneath which was sitting on scales.

[1096] The evidence is that organic, general and re-cycloned pollen were not mixed into the same jars. However, other than those distinctions, pollen was regarded as interchangeable. As Ms Hamlyn explained, a New Zealand customer might be given Chilean pollen, or that pollen might be used for export. This was because “for us, pollen was just all the same.” Ms Lyons said that pollen used in October had generally been bought the season before. This would therefore fit with pollen extracted from the anthers in 2009 being used on Olympos in October 2010.

[1097] The evidence is that the quantity of pollen extracted from the anthers was small. Therefore, unless it was set aside and used by itself in an experiment, it is likely it was combined with other pollen. It seems to have been the case that low viability pollen was still regarded as having some utility and may have been combined with higher viability pollen to make up a jar. That said, if it was combined with other pollen, it is more likely that this would have been with pollen that had a similar viability. This, and the fact that the canisters used by Mr Limmer to artificially pollinate Olympos tested negative for Psa, reduce the prospect that the Chinese pollen was used to artificially pollinate Olympos in spring 2010.

[1098] In summary, it is possible but not likely that the pollen from the anthers ended up mixed with other pollen applied to Olympos in spring 2010. Nevertheless it is not a possibility that can be discounted altogether.

Third possibility: RPI: Contaminated pollen used in spring 2010

[1099] The evidence establishes that there was a risk that other pollen could have been contaminated by Psa3 in the pollen extracted from the anthers. This is because there were no specific cleaning or hygiene practices in the pollen room before Psa. Specifically:

- (a) Ms Mitchell said the funnels and instruments that were used for transferring pollen when measuring it were not sterilised. She said they were cleaned but “mainly” Matilda would be used to clean up the pollen room, rather than any other cleaning method.
- (b) For testing the pollen Ms Lyons used a tool similar to a toothbrush with its head cut off. It had a tiny scallop of plastic that could be dipped into the pollen to obtain a tiny sample. (Ms Mitchell gave a similar description.) This tool would be periodically cleaned with a spray. She could not remember what kind of spray she used, but after the Psa outbreak she used Dettol. Everything was tested as soon as it came in, whether it was imported or domestic. It would sit in the freezer for six months to a year.
- (c) Ms Lyons said the spoon and funnel for measuring the pollen were on her work bench during the day. Pollen would be in the air and settle on the bench. She used the spoon and funnel throughout the day from batch to batch. It was not the practice at that time to clean the instruments after every single filling of a jar.⁵²² She used a Dettol disinfectant at the end of the day but she could have filled hundreds of jars in one day.

⁵²² After Psa she has used disposal straws which are thrown away each time a jar is topped up.

- (d) Ms Lyons said Matilda was used to vacuum spills on the bench or the floor to retrieve the accumulated pollen. Matilda was used to vacuum the bench top every three or four jars or any time there was a direct spillage. During a busy day Matilda could be used often (every 15-20 minutes). Matilda was the only way of cleaning up spills. Matilda left the work bench visibly clean, but sometimes Ms Lyons would also disinfect the bench.
- (e) Matilda had a jar attached to it. The jar would be labelled Matilda for general pollen or it would have a green sticker if it was organic pollen. Re-cycloned pollen was kept and tested for viability.
- (f) Matilda was serviced from time to time, but not frequently. Mr Moore thought he serviced it about three or four times over ten years. Other evidence suggested it might have been serviced a little more frequently than Mr Moore's servicing, but no-one suggested it was serviced regularly throughout the year.

[1100] As discussed earlier, the precise time that Ms Hamlyn extracted the pollen from the anthers is not known. Her evidence is that she used Matilda for this. Psa can survive on equipment for a few hours even if no plant material is present. It is, however, very likely that some plant material would have been present in Matilda given its frequent use and its infrequent cleaning. If the anthers had Psa3 it is reasonably possible that this contaminated other pollen that went through Matilda before being combined with other re-cycloned pollen and made available for use for artificial pollination.

[1101] The main factor that reduces the likelihood that contaminated pollen was used on Olympos in spring 2010 is that the canisters used tested negative for Psa. Principally for this reason, it is possible but not likely that the pollen from the anthers ended up mixed with other pollen applied to Olympos in spring 2010. Nevertheless it is not a possibility that can be discounted altogether.

Fourth possibility: RP2: experiments in or after spring 2009

[1102] As discussed above, Mr Crawshaw carried out experiments using dead and low viability pollen on his orchard. Mr Moore also understood from Mr Crawshaw that he used the commercially unviable pollen by applying it on the orchard. This was because it could still have an effect if applied. Mr Moore was interested in this as an orchardist who used artificial pollination. He said that Mr Crawshaw was often experimenting with things on his orchards. He would try different sprays and fertilisers.

[1103] The main reason why the defendant submits this possibility is implausible is that the pollen was not organic. Mr Crawshaw said they used organic pollen from Kiwi Pollen. Ms Hamlyn would consign it to Kairanga and record it. There was an organic certification process. He said they never used recycled or low viability pollen. As discussed Mr Crawshaw's evidence is not reliable on a number of topics.

[1104] When tested on his use of re-cycloned pollen there was also the following exchange:

- Q. Okay. So then re-cycloning, you're adamant in your memory, are you, that you didn't use any re-cycloned pollen in 2009 and 2010?
- A. That was – that's my memory, that we didn't use any pollen that was re-cycloned and I know that the machinery that we were using – so I'm not suggesting that there wasn't inadvertently a container with some re-cycloned pollen that got into the system, as it were.
- Q. And in the same way, could we say the same about lower viability pollen that could get in the system?
- A. You could. It's not impossible that something got through the system, as it were. So it's not absolute – I don't want to be absolute about any of this process. It could have happened.

[1105] The evidence of Mr Moore was put to Mr Crawshaw in the following exchange:

- Q. "I recall that the blowers mounted on motorbikes were used and tested at my orchard on Main Road, on Graeme Crawshaw's orchard and also an orchard across the road known as Olympos which was managed by Peter West." Do you agree or disagree with that?
- A. The quad bike blower, yes, I would agree with that.

- Q. And then he says, still on paragraph 10 of his brief, “The motorbikes would go back and forth between the orchards without any cleaning. That was normal practice prior to Psa.”
- A. Yes.
- Q. Correct?
- A. Yes.
- Q. And please understand no one’s criticising that because pre-Psa was a different world.
- A. No, fine, exactly.
- Q. And then he says at 14, “I understand Graeme often used commercial unviable pollen by applying it to his orchard. For pollen to be saleable, it needed to have a certain viability, but pollen that was not saleable could still have an effect if applied. I remember Jan telling me that Graeme would come in on the weekends to collect the sweepings to use them on his orchard.” Comments on that?
- A. We – well, firstly, the quad bike that he’s talking about is the machine that includes the same mechanism as on the mini duster and the same comments apply, the pollen doesn't flow through that machine unless it’s quality pollen and –
- Q. Well, you made a reference to 10% earlier, what ...
- A. – and prior to Psa.
- Q. Yes.
- A. I, at no time, targeted using anything other than best quality pollen and with organic certification on my orchard and the, and that goes to the tests that I understand were done on Olympos Orchard as well, and Tony Moore’s.
- Q. Okay. Can I break this down because this is important for us to understand. Is it your understanding that, say, 50% viability pollen compared to, say, 100% viability pollen does not mean that any fruit that’s born is inferior. It means it’s less complete because not every piece of pollen will be fertile. Is that your understanding? In other words, you’re doing no harm by applying it and you may be gaining something by applying viability pollen. Is that your understanding too?
- A. I think so.
- Q. Right. If, for example –
- A. And I’ve never tested that question
- Q. Yes, and we have scientists, I think, who will back that up and say that that’s right but don’t you worry about that if that’s your understanding.

So based on that understanding, which a number of people share, it would be right, wouldn't it, that if you had sprayed your orchard with 70% pollen and could for free spray some areas again with 50% pollen – for free – it would make sense to? Do you agree with that proposition or not?

A. I don't disagree with that proposition and in 2009 and 2010 we were pollinating all of our orchard with mini dusters.

Q. Right. So this comes back to your point that they would sometimes jam with low viability pollen?

A. They just didn't work with low-viability pollen. They always jam.

...

Q. And with the bikes going backwards and forwards between orchards and being refilled, there might be a little bit of leftover re-cycloned in the blower from your orchard that goes to your other orchard?

A. Well, it would be left over if it was ever put into the mechanism on the bike because it wouldn't go through so it would be blocked and it would still be in the jar on the top of the mechanism so that's – it just doesn't work.

Q. One thing that wouldn't block – and I know this was a point you were strong on and that's laudable and I understand why – it must also be possible theoretically that there could be a lapse in the organic standards inadvertently and that non-organic pollen might somehow come along for the ride to your orchard?

A. It could've happened.

Q. Right. And then wrapping all this up, your confidence about recycled pollen not being used on your orchard is because, I take it, of your confidence that you were using the mini dusters that couldn't run it?

A. That and that it was never my intention to use anything other than best quality pollen because we simply made more money from selling the fruit. If the fruit was best quality, we made more money from that than any shortcut in the value of the pollen might've –

[1106] Mr Crawshaw was then shown a Kiwi Pollen invoice dated 21 October 2010 billed to Kairanga Trust. The description said “Organic pollen 250 grams. Please use sifted re-cycloned pollen.” Mr Crawshaw was asked why it would refer to re-cycloned pollen. He replied:

A. I would say it's either a mistake on the document or it's an error of my memory and in that case I would like to apologise to the Court in that I was attempting to answer from the best of my recollection and memory and if this is an accurate document and we have no reason to doubt that it's an accurate document then I apologise for my lapse in

memory because I don't remember this pollen being used and I don't, I don't deny that it may well have been.

[1107] He also said that he did not know where it was used “and it may well have been used on our orchard”. He could think of no reason why Kairanga Trust would have received a GST invoice for the pollen, other than for its own use. It may have been used on the orchard, he did not recall using it and he had not intended to use it. He denied using pollen that was below the high commercial standard.

[1108] None of this suggests that Mr Crawshaw would have used non-organic pollen intentionally on Kairanga in his experiments. It does not exclude unintentional use, for example if it was not labelled, or if it contaminated other re-cycloned pollen that went through Matilda.

Fifth possibility: RP2: used with other pollen to pollinate Kairanga in spring 2009 or 2010

[1109] Kairanga had artificial pollination in 2009 and 2010.⁵²³ They used hand-held mini-dusters that use dry pollen. It is possible they used a wet applicator in the area in block C that is next to the shelter belt that did not get as much sun.⁵²⁴ On average he used 150 g of pollen per hectare every second day during peak flowering, which meant there would be three or sometimes four applications each season. The mini duster and the pollen would be put back into jars and would go into the freezer for use the following day. The pollen in those jars would be bulked up.

[1110] For the same reason as with experiments on Kairanga, it is unlikely that Mr Crawshaw intentionally applied non-organic pollen to his orchard. It does not exclude unintentional use for example if it was not labelled, or if it contaminated other re-cycloned pollen that went through Matilda. Further, Mr Crawshaw said Mr Limmer used Mr Crawshaw's machines for his contracting business. Mr Crawshaw briefly visited Olympos while Mr Limmer was applying pollen there. Mr Limmer used the

⁵²³ Mr Crawshaw explained they used artificial pollination in conjunction with bees at Kairanga. They enhance one another. The pollen encourages the bees, and the bees collect some of the artificially applied pollen and spread it around. Once the bees have decided there are no more flowers, they are finished. The flowers at the edge of the rows come a few days later. For these, a hand sprayer is used to apply pollen.

⁵²⁴ Wet application of pollen is thought to pose a higher risk of Psa multiplication.

quad bike machine with the four guns at the front. He may have got the machines from Kairanga and gone across the road to Olympos. Mr Crawshaw did not recall whether he used this on his orchard in 2010. He recalled using the hand machines but “it might’ve been that Brett put some pollen on our orchard. My guess is that he didn’t but I don’t know.”

Sixth possibility: RP2: the pollen contaminated other pollen that was applied in spring 2009 or 2010.

[1111] For the reasons already discussed, this possibility arises and seems more likely than intentional use on Kairanga, whether through experiments or used with other pollen to artificially pollinate the orchard.

Seventh possibility: anthers debris contaminated equipment used on RP1 or RP2 in spring 2009.

[1112] As already discussed, Mr Moore said the quad bike applicator was tested on his orchard (which was near the pollen room), Kairanga and Olympos. This raises the possibility that Psa3 in the debris, if not placed in the rubbish bins and removed entirely in this way, was carried to Kairanga and/or Olympos on the bike wheels. Mr Moore said the motorbikes would go back and forth between the orchards without cleaning. This was normal before the Psa incursion. If contamination occurred in this way, it is more likely this was in 2009 than 2010, after the anthers were cycloned and before the anthers decomposed, blew away, or were tidied up and put in the rubbish.

Eighth possibility: RP1 or RP2: pollen or anther debris otherwise contaminated the orchards

[1113] If the anthers waste was not fully removed through the rubbish bins outside the pollen room it is possible that any Psa3 in them survived and in some other way (through the natural elements or an unintentional human assisted conveyance) ended up on RP2 (where Ms Hamlyn and Mr Crawshaw lived and worked) and RP1 (which Mr Crawshaw had access to). A number of factors support this possibility:

- (a) As described by Mr Balestra, Psa can live in soil, prunings and leaf litter and can be carried from orchard to orchard on the soles of shoes

and tyres of vehicles. He notes a survival time in leaf litter of 15 months has been recorded.

- (b) Similarly, Dr Vanneste said plant material was really a major risk for transfer of Psa from one orchard to another. Leaves were a risk because:

... yes, you have fragments of leaves in most of the machinery ... and it is easy to overlook in a corner of a bin, a couple of fragments of leaves and those fragments can carry inoculums, little drop of [exudate] ...

- (c) Dr Vanneste agreed that this could then be carried on a boot saying, yes “so all that could be”.
- (d) The size of the initial Psa population does not play a fundamental role as to whether Psa can infect a plant. It is more important that Psa is able to penetrate inside the plant. Once it is inside the plant it can multiply.
- (e) Cross contamination was identified as a risk after the incursion when Kiwi Pollen sent samples for testing. For example Dr Vanneste tested the Chilean pollen, which he described as potentially the “smoking gun”, but then learned cross-contamination had occurred meaning there was no guarantee that the samples he had received were representative of what had been imported.
- (f) The risk of spread from pruning equipment appeared on MAF’s 2004 Psa data sheet.
- (g) The risk that Psa-infected pollen or plant material reached Kairanga or Olympos by the movement of people was specifically acknowledged in MAF’s Pathway Tracing Report, which said “Direct connections between RP2 and the pollen company may also have led to the introduction through people movements.”

Conclusion on infection opportunities

[1114] There is a myriad of possible ways for Psa3 to have infected RP1 or RP2 in spring 2009 and 2010. Some of those ways seem more plausible than others. But none can be entirely discounted. Psa3 is a robust bacteria that survives in plant material and can be spread in multiple ways. I do not accept the defendant's submission that the law requires one of the identified possible pathways to be proven to the balance of probabilities. I do accept the plaintiffs' submission that it is not necessary to find any of one of these ways as the likely pathway for infection. The fact that there are multiple possible ways is itself a strand of circumstantial evidence, which can be added to the other strands of the cable supporting the plaintiffs' inference of causation.

Timing of symptoms consistent with infection opportunities

[1115] The next question is whether any of the identified possible opportunities for infection at RP1 or RP2 from the pollen or anthers debris from the June 2009 anthers consignment are consistent with what is known about the timing for symptom expression following infection. The evidence about this primarily came from Mr Balestra, Dr Beckett and Dr Vanneste. Dr Everett also provided some comment.

Summary of experts' view

[1116] Mr Balestra's view was that, if kiwifruit plants are infected with Psa3 by pollen, it could take "anywhere between several weeks and one year before infected plants show the first symptoms of disease." Psa has a latent or endophytic period on Hort16A for the expression of symptoms. He considered infection in Hort16A in Latina, Italy was present in 2007 although the symptoms were observed later. He considered current scientific knowledge has not shown temperature to be a factor in the length of the latency period. That said, temperatures above 30 °C inhibited multiplication.

[1117] Dr Vanneste's view, as set out in his brief of evidence, was that the most likely time of infection was spring 2010. He considered it was less likely, but still plausible that infection had occurred in autumn 2010. One of the reasons for his view that

autumn 2010 rather than spring 2010 is the earliest likely date is the different summer temperatures of Latina and Te Puke. Mr Balestra was not persuaded by this.

[1118] In questioning, however, Dr Vanneste readily accepted a number of qualifications to this view. He accepted that if infected pollen was sprayed onto an orchard, the effect would depend on the distribution of pollen in the sample. He accepted that “in theory one cell at the right place at the right time if the nutrient is there, will multiply and give infection.” He accepted that his likely timeframe might be different if contaminated pollen applied to the orchards had been mixed with non-contaminated pollen. His timeframe had not taken into account dispersal of anther waste by the wind (despite his views about the robustness of the method in Tontou *et al* (2014), discussed further below, that the experiment may have been contaminated from an orchard 100 km away). He was not aware when pollen spraying equipment may have been tested. He had discounted contamination from cycloning because he understood the anthers had been cycloned before October.

[1119] Dr Vanneste also explained that his views about the time to symptom expression were partly based on his experiments in glass house conditions. He accepted these were “conditions that are favourable for the disease, absolutely.” He said “a plant [that] grows very fast is susceptible” and this is what he wanted “so we feed them, we water them, we heat them, we cool them if it’s too hot, we do everything we can, yes.”

[1120] He also acknowledged that on Hayward the epiphytic stage could be “a very long time” and no one could say how long because the experiment had not been carried out. He considered the epiphytic stage for Hort16A would not be very long because of host susceptibility and the favourable Bay of Plenty climatic conditions.

[1121] Dr Beckett’s view, on the basis of his review of the literature and his epidemiology expertise, was that the period of epiphytic colonisation was subject to a number of variables and the incubation period for Psa3 was complicated by the lack of an observable delineation between epiphytic colonisation and symptomless expression. He noted that Tontou *et al.* (2014) found that although Psa3 could be isolated from flowers, fruitlets and leaves during the season in which vines were

artificially pollinated with contaminated pollen, symptoms did not appear until the following season. Kim *et al* (2016), on the other hand, observed symptoms three weeks following the application of inoculated pollen in aqueous solution. He also noted from the observations in Italy in 2007 and 2008 that damage was more severe on Hort16A than Hayward and other information to the same effect. He said:

There are many factors influencing the “incubation period” (including inoculum pressure, macro and microclimatic conditions, presence or absence of nutrients, wounds, age of plants, and the plant variety) that it is almost impossible to define a unique incubation period in a host plant-pathogen interaction.

[1122] He expressed the following views about the time to symptoms:

- (a) If the imported anthers were discarded, then it seems more likely that the bacteria was introduced into one orchard in 2009, where mild symptoms in a small number of plants went unnoticed, and then spread from there to other orchards at some point prior to spring 2010.
- (b) If contaminated pollen was broadcast into either or both of RP1 and RP2 in 2009, then Psa3 could have entered the vine through pores and lesions and caused a rapid onset of the disease. However, if the bacteria was relatively mild it seems plausible that the symptoms went unnoticed in the 2009 growing season, over-wintered in dormant buds (June to August 2010) and became active in the following spring (September to November 2010). It is also possible that epiphytic colonies established in 2009 and then activated in spring 2010.
- (c) If contaminated pollen was broadcast in RP1 or RP2 in 2010, then the bacteria may have entered the vine through pores and lesions and caused a rapid onset of disease (if at least three weeks had elapsed between the application of the pollen and the observations of symptoms).

[1123] Dr Vanneste’s critique of this is directed at whether it is the vines or the flowers that led to quick infection. He says that bacteria applied directly to the flowers are

very likely to cause infection quickly. Dr Beckett responds that that if the pollen was applied to the entire vine this is likely to cause wider dispersal of Psa.

[1124] Because of the circumstances in which Dr Everett came to give evidence, she had not prepared a brief of evidence and was asked to provide her opinion based on symptoms as they had been described in the evidence and seen on the video.⁵²⁵ The defendant described these as “off the cuff” views. Nevertheless, Dr Everett is an experienced scientist who has been involved in studying Psa for many years. Her view is not to be dismissed.

[1125] Dr Everett said the most rapid spread of infection would occur if there was a very high inoculum load (the infecting population of bacteria). Leaf spotting within a week was possible with a very high load. It would take much longer if the inoculum load was low. She considered that there may have been one or two central points at Olympos which spread out, or a low amount of inoculum spread out over the whole orchard. If the inoculum load was high, symptoms may have started around two weeks after being spread. If the inoculum was lower, then it may have been spread one or two years prior to the symptoms.

[1126] Dr Everett also commented on lab conditions versus the real world. In lab conditions symptoms have been observed two weeks after inoculation on Hort16A, where inoculum is applied to young plants with the intention of causing infection. In the real world, where there may be a low level of inoculum, a plant could be symptomless for a period, and it was not possible to be definitive because no one had carried out the relevant research.

[1127] Mr Max, who had the “hands on” experience from Italy and New Zealand, considered the time between exposure to infection and symptoms could have been between two months and one to two years.

⁵²⁵ *Strathboss Kiwifruit Ltd v Attorney-General* HC Wellington CIV 2014-485-11493, 11 August 2017, Ruling of Mallon J on MPI related witnesses at [5]-[8].

Tontou et al (2014)

[1128] There was some focus *Tontou et al (2014)* in the experts' evidence. This is because it is the only field-based study published about time to symptoms. It was conducted on a kiwifruit orchard in Emilia Romagna, Italy that was planted with the Hayward variety. The orchard was 100 km away from the nearest orchard. Pollen was applied to the orchard on 21 May 2012. Pollen infected with Psa3 (obtained from a contaminated orchard) was applied to uninfected vines using both dry and wet application methods. Pollen not infected with Psa was applied to other uninfected vines in the orchard. *Tontou et al (2014)* stated:⁵²⁶

During each sampling day, both in 2012 and in 2013, kiwifruit vines were carefully inspected by one operator per side for typical symptoms of bacterial canker, especially searching for spots and lesions on leaves.

...

Results of Psa analyses and detection for both years of the experiment are shown in Tables 1 and 2. Table 1 shows data of detection of Psa within 2 weeks after pollination. Isolation of Psa confirmed the establishment of the pathogen on leaves and fruitlets.

...

Analysis of washings from fruitlets and fruits allowed detection of epiphytic Psa populations until early August 2012 from plants pollinated with wet contaminated pollen, whereas fruitlets or fruits collected from dust-pollinated plants were positive for Psa, mainly only with PCR, until early July. On leaves, Psa was regularly detected during May to early August on wet-pollinated plants. Thereafter, detection of the pathogen was erratic, but sometimes also positive in October. Psa was not detected on leaves of dust-pollinated plants from early July onwards (Table 2).

During wintertime, samples of pruning residues were analysed for endophytic presence of Psa for each treatment and replicate in the experiment. Psa was not detected on that plant material, either with PCR or direct isolation.

During the growing season of 2013 (May to October) Psa detection and isolation were erratic. Three samples from wet pollinated plots and two samples from a dust pollinated plot were positive for Psa in May, June and July (Table. 2). These results suggest that small Psa populations may have survived during the winter and then multiply in spring of the following year. Detection of Psa during the second growing season after artificial pollination was successful in scattered sites inside the orchard. Psa was also detected on a few control plants, which were pollinated with non-contaminated pollen the previous year. Detection and isolation of Psa in 2013 indicated establishment

⁵²⁶ *Tontou et al (2014)* at 335-337.

and movement of the pathogen inside the orchard, possibly from wind driven rain or pollinating insects.

During the spring and summer of 2013, necrotic spots resembling Psa lesions were seen on leaves of three wet-pollinated plants out of 16 (disease incidence = 19%), that had been pollinated the previous year, and one dust-pollinated plant out of 16 (incidence = 6%). From those lesions Psa was isolated. ... To our knowledge, this is the first report of the possibility of Psa spread inside a kiwifruit orchard from contaminated pollen, and its connection with typical foliar lesions caused by the pathogen. The disease was only observed as leaf spots. No cankers were observed on any vines until autumn 2013. No symptoms were detected on any of the plants pollinated with non-contaminated pollen, throughout the season.

These results suggest that Psa overwinters on host plants. Since no symptoms were observed during 2012, and all samples collected to detect the pathogen internally in vines were negative for Psa, our data suggest that overwintering of the pathogen could be in dormant buds ...

...

The detection of typical disease symptoms the following year after pollination only on a few plants (three out of 16 for the wet pollination treatment) may indicate that naturally contaminated pollen was not carrying enough inoculum to cause an outbreak within the season of pollen application. Nevertheless, the results presented here indicate that pollen transfer has potential to start initial disease foci and disease establishment, as is frequently the case for phytopathogenic bacteria with epiphytic life cycle phases (Sigeo, 1993).

[1129] Mr Balestra, Dr Beckett and Dr Everett all placed reliance on this paper, amongst others, in giving their views about time to symptoms in this case. Dr Vanneste, however, sought to cast doubt on the conclusions in the paper. He considered there was “no data to support that the symptoms expressed are due to the bacteria brought with the pollen”. This was because:

- (a) Psa was found in a non-treated part of the orchard (the control area), which the authors attributed to insects, although they did not present any supporting data;
- (b) the contaminating Psa strain was not “marked” so it was possible that contamination had come from some other orchard (even though the orchard selected for the experiment was 100 km away from the next closest orchard);
- (c) there was possibly a sampling issue;

- (d) it was difficult to be sure there were no symptoms in the first season on the vines sprayed with the non-contaminated pollen because the authors did not provide data about how the survey was carried out;
- (e) the authors had referred to an example of a plant pathogenic bacteria spread by bacteria when that had never been demonstrated for that pathogenic bacteria; and
- (f) the authors had relied on non-scientific papers such as MAF and EPPO reports.

[1130] Mr Balestra, Dr Beckett and Dr Everett all disagreed with Dr Vanneste's criticisms of the experiment. For example, Mr Balestra considered the fact that the paper had been published in an international, high impact journal, which involved an anonymous peer review process, meant that the methodology used and conclusions drawn were appropriate and valid. Dr Beckett referred to examples where Dr Vanneste had, in his own research (appropriately in Dr Beckett's view), drawn conclusions from the material that he criticised in Tontou *et al* (2014).⁵²⁷ Of Dr Vanneste's view that marked strains should have been used, Dr Everett said this:

- A. Well, using marked strains is not usually required for proving what this is called Koch's postulates. So Koch's postulates, you isolate the suspected disease-causing organism from the symptoms, and propagate it in pure culture, and then you put it back on a symptomless plant to cause the same disease symptoms and then you re-isolate again from the disease symptoms, take it out into pure culture and identify it again to show that it is the same pathogen as what you put there. So that's called Koch's postulates.
...
- ...
- A. ... It's a human medical term as well, and it has that particular use in plant pathology, what I just described, and nowhere in Koch's postulates is it, you have to use a marked strain. If you can identify the bacterium, which they did, as Psa, which is what they put there

⁵²⁷ For example, Dr Vanneste says the authors in Tontou *et al* (2014) used *E. amylovora* (a causal agent of fire blight) as an example of a plant pathogen bacterium spread by pollen when, in Dr Vanneste's view, pollen dispersal for *E. amylovora* had never been demonstrated. However Dr Vanneste had himself published statements and scanning electron micrographs advising of the likely role of pollen in the transmission of *E. amylovora*.

in the first place, then that's sufficient to prove Koch's postulates, which is, you know, what I just described.

Q. And do you have any idea about the vintage of Koch's postulates?

A. Oh, sure, it's a medical thing. Probably 18 something or other. It's a very old concept.

Q. So how would that relate to the Ark papers and the Ercalani et cetera which follow on from Ark, am I right in inferring that they are dealing with Koch's postulates as well?

A. Yes.

[1131] Dr Vanneste's approach was one of looking for anything that might cast some possible doubt on the conclusions in Tontou *et al* (2014). He also referred to the author's own comment that further experiments with tagged Psa strains were needed to "establish beyond any doubt" whether contaminated pollen may contribute to possible disease outbreak. Those matters led Dr Vanneste to say that there remained "continued uncertainty about the role that pollen plays in the spread of Psa in kiwifruit." However, in a civil claim proof beyond any doubt is not required. Moreover, the court considers all the evidence, including the views of all the experts who gave evidence, when making its factual findings.

[1132] For these reasons, I consider Mr Balestra and Dr Beckett were correct to take into account the conclusions in Tontou *et al* (2014) in forming their views.

Conclusion

[1133] A biological model, referred to as the disease triangle, is premised on the notion that the way in which a pathogen behaves depends on the pathogen, the host and the environment. The science does not enable anyone to be accurate about when RP1 and RP2 must have been infected with Psa3 in order to display the symptoms observed in October and early November 2010. The epiphytic stage may not be long (although there is debate about this) and the endophytic stage may be short or long. The evidence establishes there are a range of factors that can influence the time between a kiwifruit vine's exposure to Psa3 and when it exhibits symptoms. The plaintiffs accurately summarised these factors as follows:

- (a) the number of bacteria that come into contact with the vine (inoculum level);
- (b) what part of the plant they come into contact with (e.g. trunk, leaf, flower);
- (c) whether there are wounds on the plant when they first contact or afterwards;
- (d) the climatic conditions of the orchard generally;
- (e) the season (Psa growth and spread does slow over winter, but has still been observed);
- (f) whether there is water present at the time of exposure, or if not how long after exposure water is present;
- (g) the variety of the vine; and
- (h) the age of the vine.

[1134] I accept the expert views that around one year to a few weeks, depending on these factors, is within the likely range of when RP1 and RP2 were exposed to Psa3. The defendant submits that RP2 cannot have been exposed to Psa3 during spring 2010 pollination, because the first symptoms were observed by Ms Campbell prior to pollination. The evidence about that timing is not precise. More importantly, this evidence does not exclude other possible infection times and nor the possibility that RP2 was exposed to Psa3 more than once. In my view, the expert evidence about time to symptoms is consistent with each of the possible pathways the evidence gives rise to.

The genetic evidence

The experts

[1135] Four experts gave evidence concerning the origin of the New Zealand Psa outbreak on the basis of genetics.

- (a) Dr Angelo Mazzaglia: He is a researcher at the University of Tuscia, Italy and is a colleague of Mr Balestra. Particularly since 2008 he has specialised in researching kiwifruit disease.
- (b) Dr Russell Poulter: He is an Associate Professor at Otago University in the Department of Biochemistry. Since mid-2011 a major focus of his research has been genetic analysis of Psa.
- (c) Dr Honour McCann: She is a post-doctoral researcher at Massey University. Her expertise is in Psa evolutionary genomics.
- (d) Professor Edward Holmes: He is a Professor in biology and medicine at the University of Sydney. He is a distinguished scientist, globally recognised as an expert in the evolutionary analysis of gene sequence data, with a particular focus on phylogenetics.

[1136] Dr Mazzaglia and Dr Poulter were called by the plaintiffs. Dr McCann and Professor Holmes were called by the defendant. Dr Poulter, Dr McCann and Professor Holmes gave their evidence as a panel (also known as a “hot tub”).⁵²⁸ Dr Mazzaglia gave his evidence from Italy via audio-visual link immediately before the panel of the other three experts.

[1137] The defendant contends the Court should be cautious about relying on Dr Poulter’s evidence because he is personally invested in the outcome. He says this

⁵²⁸ The process adopted was as agreed by counsel and set out in a memorandum approved by me. Each expert read their briefs in the order they were filed. Each then had ten minutes to summarise their key points. Each were then cross examined during which counsel could refer to their expert for a response at the end of a particular topic. Throughout counsel allowed me to ask any questions as they arose. The experts also illustrated points on a white board throughout. These illustrations were then photographed by counsel and included in the bundle of documents.

personal investment arises from his long standing involvement in the case and his long and strongly held view that New Zealand's Psa3 came from Shaanxi. He was interviewed on RNZ about his views in July 2012 and wrote to the Director-General of MAF at that time. He also signed an affidavit in support of the claim when the Court was considering whether to approve the litigation funding arrangements. The defendant submits he has aligned himself with the plaintiffs and is not impartial.⁵²⁹

[1138] I accept Dr Poulter has been involved in the matter for a long time and his views are strongly held. Those views have led him to support the claimants. However his work was carried out before he was aware of any physical link between Shaanxi and New Zealand in the form of imported pollen, before he began assisting the plaintiffs and before he learned that the Shaanxi strain from which his analysis was made was obtained from an orchard near where the anthers came from. I do not regard his views as outside his expertise. I see no issue with an expert considering the genetic analysis in the context of other relevant information. I do not dismiss his evidence on the grounds that he has come to be aligned with the plaintiffs' case. I consider it on its logical strength.

[1139] I do not have any concerns about the impartiality of the other experts. Each gave their evidence on matters within their expertise. There is no suggestion Dr Mazzaglia was doing anything other than giving impartial evidence on matters within his expertise. He was careful to limit his evidence to this. Dr McCann was reluctant to accept hypotheticals put to her by plaintiffs' counsel in a way that was somewhat obstinate and dismissive. However it is clear she found the hypotheticals too hypothetical and not grounded in likely scientific reality. This does not count against my views of her evidence. Professor Holmes was more aligned to Dr McCann's views than Dr Poulter. However that was because he regarded her evidence as orthodox phylogeny science whereas that was not his view on aspects of Dr Poulter's evidence.⁵³⁰

⁵²⁹ For example, he confirmed in questioning he would like the claimants to succeed and he believes "the Crown was negligent" and "individual growers were completely ruined as a consequence and as a member of society, I don't think that's right. But, you know we may lose."

⁵³⁰ He was cross examined about an apparent inconsistency between what had been said in an article of which he was a co-author and an answer he gave in evidence about drawing a conclusion from one sample. That cross examination suggested he had overstated his position in that answer. He accepted that but also made the point that it does depend on what the sample is and the

The process

[1140] The experts were directed to confer prior to trial.⁵³¹ All four experts agreed there was most likely a single, recent entry of Psa3 in New Zealand. Collectively they did not agree on the extent to which the timing of this entry can be accurately inferred from the genetic data, nor on the most likely geographic source of the New Zealand Psa3 outbreak. However two of them, Dr Mazzaglia and Dr Poulter, were agreed on the following further matters:

- (a) the New Zealand outbreak did not come from Italy, Chile or Japan;
- (b) it also did not come (Poulter) or it is unlikely that it came (Mazzaglia) from Korea, and the Korean strains of Psa found before 2014 were not pandemic Psa3;⁵³² and
- (c) the probable origin of the New Zealand Psa3 incursion is Shaanxi, China.

Some background

a) DNA

[1141] DNA molecules consist of two complementary strands of nucleotides (the double helix). Each strand has a sequence of bases. There are four types of bases: adenine (A), guanine (G), cytosine (C), and thymine (T). The bases encode various macromolecules which determine the characteristics of the organism.⁵³³ The two DNA strands are complementary in that the bases of the two strands are paired: adenine pairs with thymine, and guanine pairs with cytosine.⁵³⁴ They are paired via hydrogen bonds.

phylogenetic link you are seeking to draw. None of this detracts from the strength and impartiality of Professor Holmes' evidence.

⁵³¹ High Court Rules 9.44.

⁵³² The sub-clade of Psa3 responsible for the Italian and New Zealand Psa3 outbreaks.

⁵³³ The sequence is the order across the strand that the four bases appear: Eg, AAGTCCGGTA etc.

⁵³⁴ So in the sequence given as an example in the above footnote, the sequence in the other strand would be TTCAGGCCAT etc.

[1142] A chromosome is the complete DNA picture for a particular organism. While a chromosome may have millions of base pairs, not all of those base pairs control the biological functions of the organism. A series of base pairs that codes a biological function is known as a “gene”. The sections of the base pairs between genes that do not control any known function of the organism are known as “non-coding” sequences.

[1143] Psa has one main chromosome – it is a circular molecule of double stranded DNA.⁵³⁵ Additionally, it may contain one or more “mini-chromosomes” or plasmids. These are circular DNA molecules that replicate separately from the main chromosome. The main chromosome and any plasmids make up the total genetic material (that is, the genome) of Psa. The total genetic material (the genome) of Psa consists of just over 6.5 million base pairs. Most of these base pairs are in the main chromosome. Plasmids contain around 50,000 or 100,000 base pairs, depending on the plasmid.

b) Mutations

[1144] Reproduction of bacteria occurs by cell division. The process begins with the DNA of the cell dividing into two replicates and ends with the cell splitting into two identical daughter cells, which are clones of the parent cell. However the DNA replication process is not perfect. Mutations may arise in the daughter cell. The mutated daughter cell can then propagate to form a subclone with characteristic differences from the original parent. This is called vertical inheritance.

[1145] The major forms of mutation are point mutations (the change of a single nucleotide (SNP)) or DNA rearrangements (such as insertions or deletions).⁵³⁶ Both point mutations and insertions or deletions in bacteria generally occur at a low frequency. That is, at about one in one million to one in 100 million organisms acquire a chance mutation.

⁵³⁵ Compared with human beings, for example, which have 46 chromosomes.

⁵³⁶ Some insertions or deletions in DNA are due to transposable genetic elements. Insertion sequences are transposable genetic elements. They encode proteins which enable them to move from place to place in a particular genome.

[1146] Mutation can be advantageous, disadvantageous or neutral. Changes that are detrimental to the growth of the cell may mean that the subclone becomes extinct. A subclone with changes that are beneficial may overtake the original population. Neutral mutations are likely to accumulate over time. It is expected that, due to the occurrence of chance mutations, any population of bacteria will accumulate sequence changes over time. This accumulation of variation with time is referred to as a molecular clock. The population, that at its foundation was a clone showing no variation, will become a more diverse population over time.

[1147] Bacterial variation can also occur by horizontal transfer. Horizontal transfer involves the passing of genetic material from one cell to another. A major way this can occur is by conjugation or bacterial mating. This occurs when cells are in physical proximity. It can occur between different species. For the transferred DNA to persist in the cell it has transferred to, it must be replicated in the recipient cell.⁵³⁷

[1148] Integrative Conjugative Elements (ICEs) are mobile genetic elements that can be horizontally transferred and cause bacterial variation. They are not part of the core genome but they can integrate into the chromosome.⁵³⁸ This can occur both between the same and different species. They can also be vertically transferred between the same species. Most of the New Zealand Psa3 samples analysed have PacICE1, an ICE which has 100,903 base pairs. The significance of this, if any, is an issue between the experts.

c) Methods for genetic analysis

[1149] Phylogeny is the analysis of genetic relationships. Different methods are used to carry out the analysis. Some methods analyse part of the genome while others analyse the whole genome.

⁵³⁷ Replication can occur through recombination, the integration of the transferred DNA into the bacterial chromosome or by the establishment of a plasmid. Conjugative plasmids encode all the genes necessary to promote cell to cell contact and the transfer of DNA.

⁵³⁸ ICE elements are similar to conjugative plasmids. However they integrate into the main chromosome of the bacteria. They encode proteins that organise ICE excision from the genome and their transfer to another bacterium. They range in size. They generally integrate at specific sites in the genome. They are able to transfer between species of bacteria.

[1150] One method that analyses part of the genome is multilocus VNTR (variable number of tandem repeats) analysis (MLVA).⁵³⁹ This method analyses regions in the DNA (“microsatellites”) where a small number of base pairs (three to 12) are repeated multiple times in tandem one after the other (tandem repeats).⁵⁴⁰ During replication the double strand temporarily dissociates and can then mispair through expansion or contraction, resulting in insertions or deletions and a degenerated/imperfect tandem repeat.⁵⁴¹

[1151] Strains can be distinguished based on the number of repeats present at a particular site. When a group of isolates analysed have exactly the same number of tandem repeats in all the loci they are grouped together as a haplotype. Haplotypes can be further grouped into clonal complexes. A clonal complex will include haplotypes that differ by a particular percentage of differences across the loci.

[1152] The MLVA method is suitable for analysing genetic diversity of a genetically homogeneous species such as *Psa*. It was principally developed for use in outbreak situations to identify different populations. It is accurate and fast for this purpose and is cost effective. This is the method used by Dr Mazzaglia. I discuss this after the evidence of the other three experts because of the different methodology he used.

[1153] Whole genome sequencing (WGS) is another method for analysing genetic relationships. It is the method used by Dr Poulter and Dr McCann. It involves amplifying and sequencing all the base pairs of DNA of a sample of bacteria against another fully sequenced sample (the reference sample).⁵⁴² This may reveal the presence of single base changes as compared with a reference sequence. A single base pair change in a sequence is known as a single nucleotide polymorphism (SNP).

⁵³⁹ It is a relatively new tool developed at the end of the 1990s when it was demonstrated that the bacterial genome was demonstrated to be crowded with stretches of repetitive DNA.

⁵⁴⁰ An example of a perfect tandem repeat at a locus is as follows: -AGCTG-AGCTG-AGCTG-AGCTG-AGCTG-.

⁵⁴¹ For example, as compared with the perfect tandem repeats at the above locus, a degenerated tandem repeat is: -AGCTG-TGCTG-AGGTG-AGCTG-AGCTC-

⁵⁴² There are facilities for sequencing the DNA such as the Genomic Analysis Service (GAS) at the University of Otago used by Dr Poulter. Dr McCann uses a German facility to which she has access.

[1154] Because WGS identifies and compares all 6.5 million pairs with the reference sample, it is the most comprehensive method for assessing the extent to which two organisms are the same or similar. It provides a high-resolution base-by-base view of the genome capturing both large and small variants. It can be applied to the primary genome and the plasmids. It can detect differences between very closely related Psa.⁵⁴³ It is accepted that it is better suited to longer-term epidemiological or phylogenetic studies directed at establishing the genetic lineage of an outbreak than the MLVA method. It is, however, more expensive than MLVA.⁵⁴⁴

d) *Psa isolates*

[1155] Different samples of Psa are often referred to as “isolates” because the Psa has been isolated from a specific location at a specific time. Where several isolates are identical, they are part of a particular strain. Similar DNA sequences present in different strains would suggest that they are related and derived from a common ancestral strain. Groups of related strains can be described as a clade.

e) *Molecular clock*

[1156] A “molecular clock” describes the relationship between time and the rate at which SNPs accumulate in a lineage (genetic distance). The evolutionary rate of a given bacteria may be constant, vary between lineages, or display no discernible clock-like signal. A molecular clock exists where there is a constant rate of mutational accumulation through time. There are well established methods for divergence dating in bacterial phylogenomics.

Summary of Dr Poulter’s analysis

[1157] Dr Poulter carried out his WGS analysis using Psa genetic material from the following sources:⁵⁴⁵

⁵⁴³ For example, many of the Psa strains isolated in New Zealand during 2010 and 2011 are absolutely identical or differ by a single base pair in the whole genome. A MLVA analysis may not detect such a slight difference.

⁵⁴⁴ Until about 2006, whole genome sequencing was prohibitively expensive and time consuming for most projects. These days a complete sequencing of a Psa strain costs around NZ\$1,000-2,000.

⁵⁴⁵ Dr Poulter carried out his WGS using a process called “read-mapping”. Under this process all of the base pair sequence is matched to the appropriate region of the reference genome. When the

- (a) New Zealand sources: who have taken a sample from an infected vine and provided them to Dr Poulter’s research group for sequencing.
- (b) GenBank: a publicly available database in which other scientists submit DNA sequences from their research.⁵⁴⁶
- (c) Other overseas sources: who have provided DNA samples for sequencing or DNA sequences to Dr Poulter.⁵⁴⁷

[1158] Dr Poulter’s reference genome was a New Zealand strain of Psa (named ICMP 18708). This strain was isolated in November 2010 from Te Puke. It was fully sequenced and assembled by Dr Poulter’s research group, and was lodged in GenBank.⁵⁴⁸

[1159] Dr Poulter’s analysis showed the following.⁵⁴⁹

- (a) New Zealand: the genomes of 83 samples of Psa3, 58 of which were from Te Puke, were isolated between 2010 and 2016 and fully sequenced and assembled. These all have eight SNPs that distinguish them from the Psa3 pandemic lineage strains from the other countries studied.⁵⁵⁰ Seven of these eight SNPs or microdeletions⁵⁵¹ all occur within a gene sequence.

sequence “reads” from a particular strain of Psa have been “mapped” to the reference genome, the differences in DNA sequence between the strains can be detected and compiled.

⁵⁴⁶ GenBank is a comprehensive database that contains publicly available DNA sequences for almost 260,000 described species. The database is curated by the National Centre for Biotechnology information in the United States.

⁵⁴⁷ It is common for researchers to exchange information in this way.

⁵⁴⁸ Dr McCann used a different reference genome (CPR11972.2). This was obtained from Plant & Food from RP1 in November 2010. It is accepted that Dr Poulter’s reference genome is not the true foundation strain as it has one additional SNP than Dr McCann’s reference genome but this does not affect his analysis.

⁵⁴⁹ Dr McCann had initially misunderstood Dr Poulter’s methodology for identifying SNPs and had concerns about the software tools he used. In fact the only demonstrated error in the SNP identification methodology was made by Dr McCann, and pointed out by Dr Poulter, which had led to the erroneous Psa3a and Psa3b subgrouping.

⁵⁵⁰ In other words, in all of the New Zealand isolates sequenced to date there are eight base pairs out of 6.5 million base pairs that have the same mutation.

⁵⁵¹ Very small deletions of 1-7 base pairs.

- (b) China: five strains from the Chinese pandemic lineage have been sequenced.⁵⁵² Four were isolated from Shaanxi province in 2010.⁵⁵³ Three of the four (including the M7 strain) share 12 SNPs. The fourth (M23) contains an additional SNP. The fifth strain was isolated in 2013 from Anhui province.⁵⁵⁴
- (c) Europe:⁵⁵⁵ these have six common SNPs and microdeletions that distinguish them from the Psa3 pandemic lineage strains from the other countries.
- (d) Chile:⁵⁵⁶ these strains have 12 unique SNPs or microdeletions.

[1160] Dr Poulter considers this shows the Psa strains in New Zealand are of a single clonal origin. In other words, they share a single common ancestor from which the other pandemic strains are not descended. This is for two reasons. First, the earliest New Zealand isolates are identical and later isolates carry additional SNPs typical of natural alterations in the genome of the bacteria over time. Secondly, if New Zealand Psa3 was derived from multiple incursions, several groups containing their own distinctive sequences could be expected and this is not what has been found. Dr Poulter considers the epidemiological pattern of the outbreak suggests the origin is where the first infected orchards were found.

⁵⁵² According to Dr Poulter's schedule one he initially had one sample, isolated from Shaanxi in 2010. He subsequently reviewed the samples obtained by Dr McCann.

⁵⁵³ Initially Dr Poulter said he had sequenced five Shaanxi pandemic Psa3 strains. He subsequently confirmed that two of the strains (differently named) were in fact the same strain. Of the four strains, three were identical to each other (M7/CH2010-6, CH2010-5 and CH2010-7). They were obtained from the same place on the same day (Dandong, Mei County, 11 June 2010). They contain PacICE1. The fourth (M23) has an additional SNP. It also contains PacICE1.

⁵⁵⁴ Dr Poulter's team obtained the 2010 Shaanxi isolates from Professor Huang Lili and Dr Zhao Zhibo in 2011 and sequenced them. These included the strain M7. At almost the same time, Mr Balestra's group at Tuscia University in Italy published their sequence of three Shaanxi strains including the M7 strain

⁵⁵⁵ Dr Poulter's schedule refers to only one strain isolated from Italy. It is unclear from the evidence how many additional whole genome sequences from European samples were analysed, but it is a small number relative to New Zealand. The maximum number appears to be 11, but that includes Dr Mazzaglia's samples for which only partial sequencing has been carried out.

⁵⁵⁶ Dr Poulter's schedule refers to two strains isolated from Chile in 2010. Again, it is unclear from the evidence how many additional Chilean samples he analysed, but the maximum number is seven and the total number is a small number relative to New Zealand.

[1161] Further, he considers the four Psa3 pandemic lineages from New Zealand, Chile, Italy and China are independently derived from a common ancestor. This is because they share no derived SNPs.⁵⁵⁷ They are distinct groups but are very closely related to each other.

[1162] Dr Poulter then considers where the ancestor of New Zealand's Psa3 originated from. For a number of reasons he reaches the view that the most likely origin is Shaanxi, China:

- (a) He considers New Zealand Psa3 is closely related to Italian, Chilean and Chinese Psa3 due to the small number of SNPs each has from their common ancestor.
- (b) He considers the New Zealand Psa3 incursion is recent (probably 2009). This is because the 2010 samples are mostly identical.⁵⁵⁸ He considers the time since the four pandemic lineages (China, Chile, Italy and New Zealand) shared a common ancestor is recent. That is, within the last 15 years (later than 2000).⁵⁵⁹
- (c) Three of the strains isolated from Shaanxi in June 2010 from the same orchard have PacICE1. PacICE1 is also present in all the early New

⁵⁵⁷ If, for example, Italy was the source of the New Zealand Psa3, then the New Zealand Psa3 would carry all of the SNPs characteristic of the Italian ancestral strain. The New Zealand strains all differ by eight SNPs from the ancestral pandemic sequence, the Italian Psa3 differs by six SNPs from the ancestral pandemic sequence, and the Chilean strains differ by 12 SNPs from the ancestral pandemic sequence. The Shaanxi strains differ by 12 SNPs from the deduced pandemic ancestor.

⁵⁵⁸ Initially Dr Poulter analysed six New Zealand Psa3 strains from 2010. He has since sequenced an additional three 2010 strains that Dr McCann had sequenced. Of the total of nine 2010 New Zealand Psa3 strains, four are absolutely identical and the average number of SNPs per strain is less than one. Dr Poulter considers that this establishes that the Psa3 strains were an almost identical clone at this point in time.

⁵⁵⁹ This analysis is based on the average number of SNPs carried by New Zealand strains isolated in 2016. Of the total 83 New Zealand strains, nine showed no sequence differences from the reference genome (ICMP 18708). Fourteen strains showed only one SNP from the original clone in New Zealand. In the six years between the earliest New Zealand isolates (2010) and the latest isolates (2016) many sequence changes have arisen. The average number of additional SNPs present in 2016 strains compared with the original 2010 strain is about six. This is very similar to the number of SNPs that distinguish the New Zealand foundation clone from the common ancestor of all the pandemic strains. Dr Poulter considers that this suggests that the common ancestor of the pandemic strains occurred relatively recently.

Zealand strains. PacICE1 is not present in any of the other Chinese strains, nor the Italian or Chilean strains.

- (d) By a process of elimination Italy, Chile, Korea and Japan are eliminated as the origin of the pandemic Psa3 lineage.
- (e) China is the largest producer of kiwifruit and Shaanxi is the hub.

[1163] Dr Poulter provides the following diagram to show the relationships among the pandemic lineages of Psa:

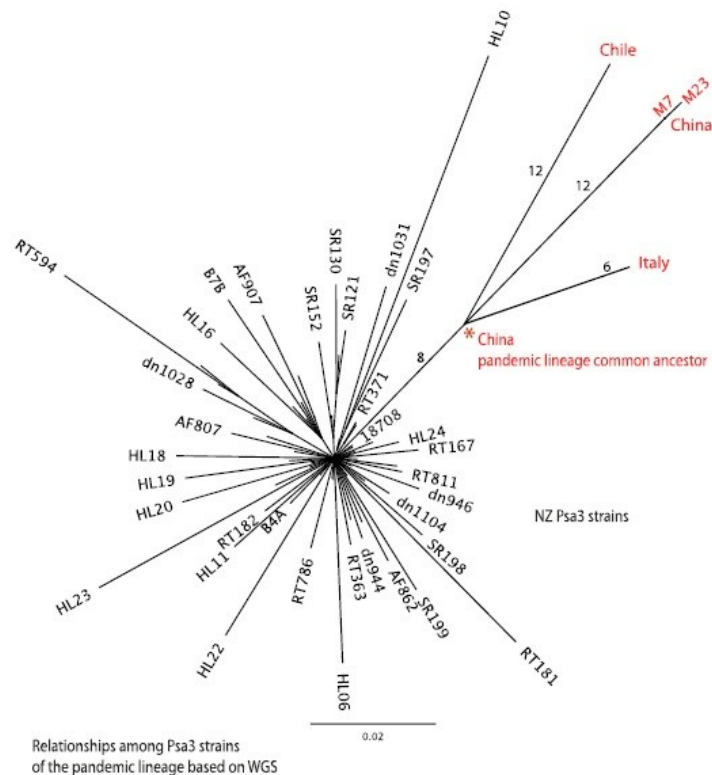


Figure 2. Diagram of the relationships among the pandemic lineages of Psa3. The common ancestor of the pandemic lineage is represented by an asterisk. The numbers on the branches leading from this common ancestor indicate the number of SNPs held by each lineage (New Zealand, Chile, Italy, two Chinese strains from the pandemic lineage). The 83 sequenced New Zealand strains are shown at bottom left (not all the branches are labelled).

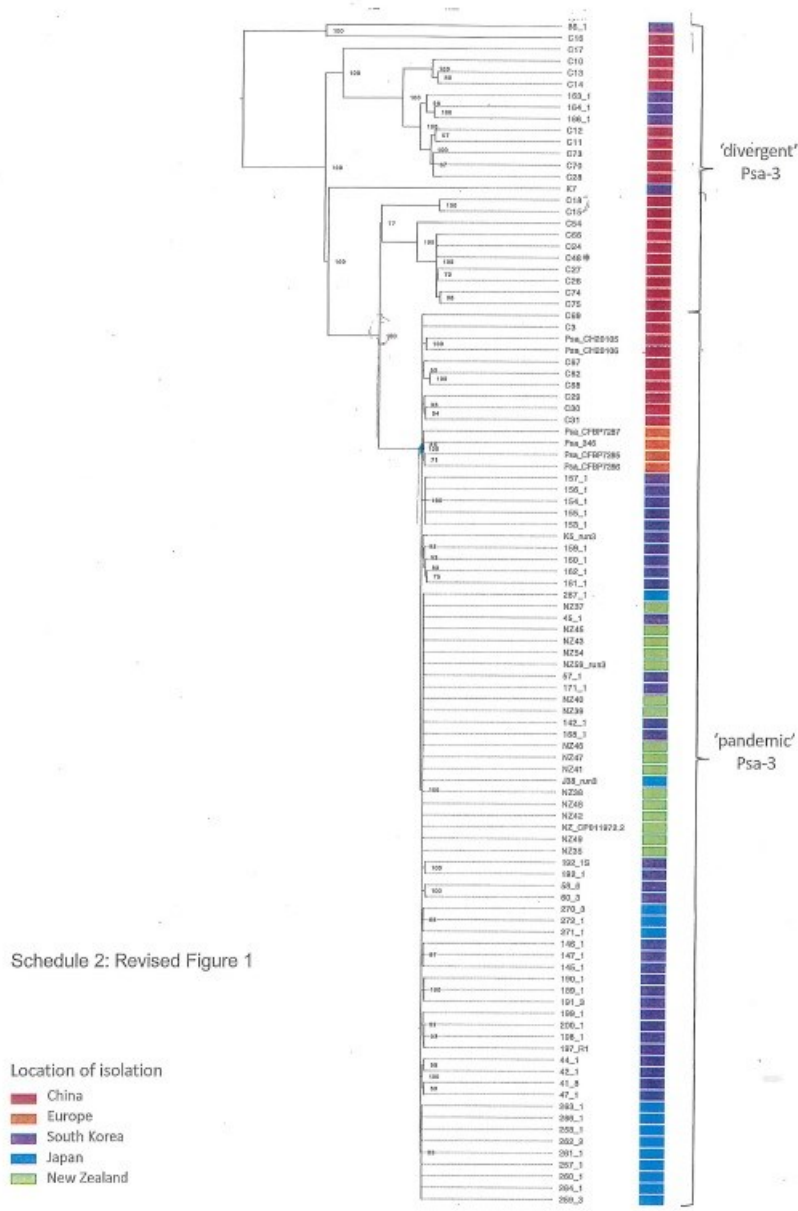
[1164] Dr Poulter's method of calculating the time since the last common ancestor, his reliance on PacICE1 and his elimination reasoning are challenged by the defendant's experts. These are issues I return to shortly.

Summary of Dr McCann's analysis

[1165] Dr McCann has prepared phylogenetic trees, which is a method for showing genetic relationships back through time. The whole genome of samples is sequenced, mapped against a reference genome, SNPs are identified, recombinant regions are removed and the phylogeny is constructed.⁵⁶⁰ Her method for building these phylogenetic trees is orthodox. It is not challenged other than that she made one error when sequencing her reference genome.⁵⁶¹ With this error corrected her updated phylogenetic tree for Psa3, as presented at the hearing, is as follows:

⁵⁶⁰ She carries out her data analysis on a computer in Germany to which she has access.

⁵⁶¹ This error was identified by Dr Poulter. It was not accepted by Dr McCann until a few days before the geneticists gave their evidence in Court.



[1166] The tree shows the evolution of Psa3, going back in time right to left. Strains sharing a node (the point where they meet) are more closely related in time than others. All nodes have “bootstrap support values” greater than 50 per cent.⁵⁶² The branch size depends on the number of SNPs (the longer the branch the greater number of SNPs).

[1167] Progressing back through evolutionary time, Dr McCann says it appears that the ultimate source of Psa (of which Psa3 is a clade) is not China, but Japan or Korea. This is because, despite sampling Psa from six different provinces, only Psa3 was

⁵⁶² Bootstrapping is a measure of how well supported the relationships are. The bootstrap measure is based on the number of times the relationship is recovered. The maximum bootstrap measure is 100 per cent which means the relationship is very highly supported.

identified in China. In contrast, both Korea and Japan harbour strains from at least three different Psa clades (or biovars). Dr McCann says that Korea appears to be the endemic home of Psa2 and Japan the home of Psa1.

[1168] The tree shows that Psa3 is of two kinds: divergent Psa3 and pandemic Psa3. China and Korea both have divergent and pandemic Psa3. Europe, New Zealand and Japan have only pandemic Psa3. Dr McCann says there is a higher level of Psa3 diversity in China compared to every other country. Korea comes second. This indicates Psa3 has been present and circulating for some time in China. Further, the comparative levels of diversity indicates that the pandemic Psa3 lineage emerged recently and has circulated for a shorter period of time relative to Psa1 and Psa2.

[1169] On the basis of her work, Dr McCann agrees with Dr Poulter that all Psa3 in New Zealand has a single clonal origin. She considers a single transmission event was likely responsible for the outbreak of Psa3 in New Zealand. This was unlikely to have been long (a matter of months to years) prior to detection in December 2010. This is because there are very few SNPs in the five 2010 New Zealand strains sequenced. Her genetic analysis does not provide any more certainty about when New Zealand Psa3 arrived.

[1170] Dr McCann agrees with Dr Poulter that the global outbreak of Psa3 is caused by a single pandemic lineage of Psa3. This is because the pandemic lineage exhibits little diversity at the level of the core genome and has undergone clonal expansion only very recently. This pandemic lineage is now present in China, South Korea, Japan, Chile, Europe and New Zealand. In China, the lineage is present in at least four Chinese provinces (Shaanxi, Chongqing, Guizhou and Sichuan).

[1171] When Dr McCann prepared her brief of evidence for this proceeding, she considered the genetic data showed that Psa3 could be divided into two subgroups (or sublineages), which she referred to as Psa3a and Psa3b. Included in her Psa3b was all New Zealand, Japanese and some Korean Psa3. All Chinese, European, Chilean and some Korean Psa3 strains were in Psa3a. If this analysis had been correct, it meant that New Zealand Psa3 was more distantly related to Chinese Psa3 than Italian and Chilean Psa3. This subgrouping arose from an error in a SNP on the reference genome

pointed out by Dr Poulter. Dr McCann accepts there is no support for the Psa3a subgrouping. New Zealand Psa3 is part of the same grouping as Chinese, European, Italian and non-New Zealand source Korean Psa3. The Psa3b subgrouping simply refers to New Zealand Psa3, which has infected Korea and Japan.

[1172] Dr McCann agrees with Dr Poulter that New Zealand, Italian and Chilean pandemic Psa3 are distinct, but closely related, groups. She agrees with him that it is unlikely that New Zealand Psa3 came from Italy. She agrees that the Italian, Chilean and New Zealand Psa3 strains share a common ancestor.

[1173] As published in 2017, Dr McCann's opinion was that China was the undoubted origin of the global pandemic lineage.⁵⁶³ This was because pandemic Psa3 lineage shares an ancestor with divergent Psa3 strains of Psa3 from a range of Chinese provinces, and China has a higher level of diversity of Psa3 than other countries. This provided evidence that Psa3 was present and circulating for some time in China and was likely endemic to China.

[1174] Since that published work, Dr McCann has continued to obtain and analyse samples, most recently from Korea. She has determined that, like China, Korea has divergent Psa3 as well as pandemic Psa3.⁵⁶⁴ This means that Korea's Psa3 has greater diversity than her previous analysis had shown. This raises the possibility that Psa3 is endemic in Korea. The alternative possibility is that there have been multiple introductions of Psa to Korea from China and elsewhere.

[1175] Dr McCann therefore considers there is "no clear evidence" of the origin of the global pandemic lineage of Psa3. Her present view is that China is the likely origin of pandemic Psa3 but Korea is also a possibility.⁵⁶⁵ However she still considers the likelihood that the New Zealand Psa3 strain is derived from China as "high".

⁵⁶³ McCann *et al* (2017).

⁵⁶⁴ Korea has divergent Psa3, pandemic Psa3 derived from New Zealand Psa and pandemic Psa3 which is not derived from New Zealand.

⁵⁶⁵ Dr McCann has identified Psa on wild *A. Arguta* in Korea and Japan. She considers that Psa3 may not have evolved on wild kiwifruit (*A. Chinensis*) as was assumed, but may instead be associated with the more broadly distributed *A. Arguta*, forming a large measure population of Psa across East Asia.

[1176] This, however, is a separate question from how Psa3 came to New Zealand. The phylogeny shows no closer relationship between the New Zealand strains and strains from Korea or China (or any specific location in China) or Europe. She considers the genetic data does not answer from where New Zealand Psa3 originated. Evidence of direct transmission from an overseas population would exist if a New Zealand sample of Psa3 shared some SNPs with that overseas source population. That evidence is not present.

[1177] For example, if there were a group of isolates from Shaanxi with some New Zealand SNPs she considers this would provide compelling evidence that New Zealand Psa came from Shaanxi. However this is not the case. There is no data in the vertically inherited core genome to demonstrate that Shaanxi was the source of the New Zealand outbreak. In her opinion, New Zealand Psa3 is no more closely related to pandemic Chinese Psa3 from Shaanxi than they are to pandemic Chinese Psa3 from Chongqing, Guizhou, or Sichuan.

[1178] Dr McCann's phylogenetic tree, as corrected, as to the origin of the global pandemic Psa3 lineage is not challenged. Dr Poulter challenges her present view that Korea is a possible source of the global pandemic Psa3. However this is on the basis of information outside the genetic data. Dr McCann does not seek to draw any conclusions beyond the genetic data as presented in the phylogenetic tree. In other words, it is a pure analysis unclouded by any other context.

[1179] Professor Holmes challenges the conclusions that can be drawn from the phylogenetic tree. He considers there is a lack of statistical support for any clear place of origin from the data. It is his view that there is "no geographic locality (eg China, New Zealand or Italy) that is significantly supported as the ancestral location of the pandemic lineage of Psa3 on the data". Again, this is a pure analysis of the phylogenetic tree using statistical analysis. It does not take into account any other context.

Professor Holmes

[1180] Professor Holmes did not offer any alternative conclusion about the origins of New Zealand Psa3 to those offered by the other experts. Instead he addresses the robustness of the methodologies of the other experts and their conclusions.

[1181] He considers there is insufficient data on Psa3 strains that circulated globally prior to 2010 and this “greatly compromises all attempts to conclusively reveal the origins of Psa3 in New Zealand.” He considers the multiple Psa lineages circulating globally make “determining precise origins ... challenging unless a more intensive strain sampling is undertaken”. He disagrees with Dr McCann’s statement in her 2017 publication that the pandemic lineage is “undoubtedly” from China because “in my opinion, we cannot conclusively tell”.

[1182] He says the 2010 Shaanxi strain M7 strain is related to New Zealand Psa3 but they are not sufficiently close to infer the direct ancestor-descendent relationship between them. The M7 strain is not the direct ancestor of the New Zealand strain.⁵⁶⁶ He considers the M7 strain and New Zealand Psa3 share a common ancestor⁵⁶⁷ but the nature, geographic location and timing of the common ancestor cannot be determined from the available gene sequence data alone. He considers it is tenable the origin of the pandemic lineage is outside of China.

Evidential conclusions from this genetic evidence

a) *Single, clonal event*

[1183] I accept the Psa3 outbreak is of a single clonal origin. That is, there was most likely a single entry of Psa3 in New Zealand and all New Zealand Psa3 has evolved from this single common ancestor. The experts are agreed on this. This evidence is within their expertise. It is not contradicted by other established facts. I accept this evidence.

⁵⁶⁶ Note Dr Poulter did not say otherwise.

⁵⁶⁷ Dr Poulter agrees with this.

b) Timing

[1184] The four experts agree it is likely the single entry occurred recently:

- (a) Dr Mazzaglia (as discussed further below) considers the New Zealand outbreak is due to a recent incursion. Calculating the timing of the outbreak is outside his area of expertise. However, his view, based on biological knowledge about the pathogen, is that infection events do not precede the appearance of symptoms by more than one year.
- (b) Dr Poulter considers it probably occurred around 2009.
- (c) Professor Holmes considers accurate timing is not available because there is no statistical support for a constant rate of evolutionary change from which timing can be estimated.⁵⁶⁸ However he accepts that 2009 or 2010 was about right but, accounting for uncertainties, his ballpark estimate would be within five years of 2010.⁵⁶⁹
- (d) Dr McCann says she cannot be certain from the genetic data when the single transmission event occurred. She agrees it was recent, being anywhere from months to years before it was detected in November 2010.

⁵⁶⁸ He says statistical analysis is needed to show a molecular clock. Professor Holmes carried out a statistical analysis on the data in Dr McCann's 2017 published analysis and found no statistically significant evidence for a constant rate of evolutionary change. He also analysed Dr Poulter's SNP data. This showed a "weak temporal trend, such that SNP differences show some increase with time, indicative of some weak molecular-clock" but there is substantial variation. For example one strain sampled in 2016 (HL10) differs from the reference strain by 0 SNPs whereas another strain also sampled that year (HL13) differs by 22 SNPs from the reference sample. This substantial variation means the time-scale of Psa3 evolution cannot be reliably estimated from this data.

⁵⁶⁹ In response to a question from me, Professor Holmes said 2010 was the latest date the incursion may have occurred (as the first symptoms were discovered towards the end of 2010); it might have been a year before that; and "I think we are splitting hairs a little bit on this one." The evidence was left unclear as to what uncertainties should be factored in so as to broaden the estimate to five years. He accepted in answer to the defendant's counsel that if Psa went to sleep over winter this would affect the reliability of the estimate. He later accepted in answer to the plaintiffs' counsel that seasonality would be factored into the data and the New Zealand data is a "good" starburst. Overall I did not take Professor Holmes to resile from his position that there was no certainty, so although 2009 or 2010 was probably about right it might have been earlier than that.

[1185] I accept that the genetic information establishes the entry of Psa3 into New Zealand was recent. I also accept the genetic information does not provide certainty about the exact timing of entry but an entry of 2009 or 2010 is within the potential likely range.

c) *China the likely global origin*

[1186] I accept China is more likely than not the origin of the global pandemic lineage of Psa3. It is not necessary to establish this to absolute certainty. Relevant circumstantial facts from which the Court may draw its conclusions do not need to be proven with absolute certainty.

[1187] Dr McCann is now less certain than she was that China was the origin of the global pandemic lineage but she nevertheless regards it as the more likely origin. Professor Holmes' approach is about certainty based on statistical robustness. Dr McCann's conclusion that China (or possibly Korea) is the origin of the pandemic is a logical conclusion that follows from the genetic data. Dr McCann's expertise to draw her conclusions is unchallenged. I accept the conclusions she draws based on her analysis. The question remains what further conclusions may be drawn based on other established factors outside her analysis.

[1188] Dr McCann's analysis is supported by Dr Poulter and Dr Mazzaglia (see below). They both take into account when Psa3 or Psa3 symptoms were reported in China and in Korea (the only other possible contender for the source of the global pandemic).⁵⁷⁰ Dr Poulter referred to public research that China had an aggressive form of Psa in 1992.⁵⁷¹ Although it was not named as Psa3 until a paper was published by

⁵⁷⁰ Professor Holmes would not exclude Italy but this is on the basis of certainties rather than what is likely in light of the data and when the first reports of Psa3 symptoms were made. Dr McCann disagrees that Italy is the common ancestor of the pandemic lineage. Dr Poulter also agrees that Italy is not the place of the common ancestor. He notes there are two SNPs characteristic of Italian strains of Psa3. These are carried by every Psa3 from Italy that has been analysed. Neither of these has ever been found outside of Italy. He considers it follows that this Italian clone cannot have been the source of the New Zealand Psa3 outbreak. Dr McCann says this analysis is only partially correct. However she also agrees that Italy is not likely to be the common ancestor of the global pandemic lineage. Italian Psa3 does not have the diversity to indicate evolutionary depth.

⁵⁷¹ It was possibly earlier than this. Dr Poulter also referred to the mid-1980s so the precise date was not clear. This is supported by Dr McCann. She said that during her field work in China she was surprised to hear that, Psa may have been an issue as early as 1988 in some locations in Sichuan.

Mr Balestra in 2012, Dr Poulter says the acknowledged authority in China now believe it was Psa3. Dr McCann agrees Psa3 has been present in China for some time given its genetic diversity.

[1189] In contrast, reports of Psa3 symptoms in Korea were not made until after 2010.⁵⁷² If Korea had Psa3 for a long time it seems to have gone undetected. It is on this basis that Dr Poulter excludes Korea as the source of New Zealand's incursion. Dr McCann considers that, in the absence of DNA evidence, conclusions regarding the origin and cause of specific outbreak events based on import/export events and disease outbreak events depend on whether events are traceable and accurately reported.

[1190] However Dr Poulter's view is supported by Dr Mazzaglia (see below). In his words, it is "extremely improbable" that Korea had Psa3 before 2010 given its "aggressiveness and the meticulous monitoring of orchards" in Korea. Dr Mazzaglia's expertise in plant pathology and Psa qualifies him to make that point.

[1191] It is also supported by Professor Koh (a leading Korean microbiologist in this area) and others in a paper published in 2016.⁵⁷³ That paper discusses that the first Psa3 incidence occurred in 2011 and it might have come through imported seedlings from China in 2006. Apart from this, Psa3 was reported in Korea in 2014 and 2015 and most of this is thought to have been caused by pollen imports from New Zealand and China for artificial pollination. Multiple introduction events would explain the evolutionary depth that Dr McCann has found in her recent analysis of new Korean samples.

d) *Is Shaanxi the source of the New Zealand outbreak?*

[1192] As Dr McCann explained, the genetic sequences do not identify where New Zealand Psa3 came from. The New Zealand strains do not share some SNPs with an overseas population from which transmission from that population could be inferred

⁵⁷² Only Italy and China were known to have an aggressive form of Psa, later identified as Psa3, at the time of the New Zealand outbreak.

⁵⁷³ Gyoung Hee Kim *et al* "Outbreak and Spread of Bacterial Canker of Kiwifruit caused by *Pseudomonas syringae* pv. *Actinidae* Biovar 3 in Korea" (2016) 36(6) *Plant Pathology Journal* 545.

on the basis of those shared SNPs. The Shaanxi strains do not share SNPs with New Zealand. Professor Holmes agrees with this. He adds that the science of phylogenetics (determining evolutionary relationships) is based on patterns of vertical inheritance, and this means seeing stable inherited characteristics that link strains. This would be SNPs in the core genome that link the New Zealand strains with Shaanxi. The data does not show this.⁵⁷⁴

[1193] Evidence to support a Shaanxi source must therefore come from something other than orthodox phylogeny analysis based on SNPs in the core genome. One of the matters Dr Poulter relies on is his analysis of the rate of evolution. For this he compares the diversity that has evolved in New Zealand in six to seven years with the diversity in the pandemic lineages. This comparison is made by averaging the SNPs over time and comparing them with the other lineages. From this analysis he concludes that the time since the four pandemic lineages (China, Chile, Italy and New Zealand) shared a common ancestor is recent. That is, within the last 15 years (later than 2000). Further, if the mutation rate in New Zealand is presumed to be similar for the New Zealand lineage and M7 (the relevant Shaanxi isolate), this suggests M7 and the New Zealand strain had a common ancestor five to 15 years prior to their isolation.

[1194] Dr McCann considers there is no evidence demonstrating that pandemic Psa3 is evolving in a clock-like manner. She considers this provides no support for a specific origin in China. She says Dr Poulter's methodology for the rate of evolution is not reliable. She accepts there is a general trend of an increase in the number of sequence differences over the sampling period, but this is not a proper temporal signal.⁵⁷⁵

⁵⁷⁴ He says the 2010 Shaanxi strain M7 strain is related to New Zealand Psa3 but they are not sufficiently close to infer the direct ancestor-descendent relationship between them: the M7 strain is not the direct ancestor of the New Zealand strain. While they share a common ancestor the nature, geographic location and timing of which cannot be determined from the available gene sequence data alone and it is tenable the origin of the pandemic lineage is outside of China.

⁵⁷⁵ A simple linear regression of SNP number over time is inappropriate as the underlying sequences are non-independent and vary in their evolutionary relatedness. She says that, at a minimum, the accepted method for identifying a temporal signal in sequence data is to produce a non-recombinant core genome alignment, generate a phylogenetic tree and then assess whether a linear regression of the root-to-tip distances (number of substitutions separating each sample from the ancestor) and age (or sampling date) of the samples produces a positive correlation. Dr McCann says the ideal is to perform Bayesian analysis to estimate a rooted, time-measured phylogeny as implemented in the computer programme BEAST.

[1195] Professor Holmes, an acknowledged expert in the area, carried out a statistical analysis of Dr McCann's data and found no statistically significant evidence for a constant rate of evolutionary change. He considered Dr Poulter's analysis showed a "weak" molecular clock but with substantial variation such that the time-scale of Psa3 evolution could not be estimated reliably.⁵⁷⁶

[1196] Dr McCann and Professor Holmes' evidence on this point makes logical sense and I accept it. I therefore consider Dr Poulter's analysis of the rate of evolution does not provide much support for a Shaanxi origin for the New Zealand incursion. However it is nevertheless within the bounds of reasonable possibility that the M7 Shaanxi and foundation New Zealand strain shared a common ancestor relatively recently. There are 20 SNPs between M7 and the New Zealand foundation strain.⁵⁷⁷ There are strains in the New Zealand lineage with 40 SNPs from the New Zealand foundation strain. This provides some support, although weak, for a Shaanxi origin.

[1197] The critical piece of evidence relied on by Dr Poulter for a Shaanxi origin is the presence of PacICE1 in M7 (isolated in Dandong, Shaanxi in June 2010), and in most of the New Zealand strains including all of the early strains.⁵⁷⁸ PacICE1 has also been found in the recent outbreaks of Psa3 in Japan and Korea, which are thought to be of New Zealand origin. It has not been found in Psa strains anywhere else, including anywhere else in China. Other strains have been found to be carrying other ICEs. The Italian and all European strains carry PacICE2. The Chilean strains carry PacICE3. PacICE1 has 100,903 base pairs. The PacICE1 in the M7 and New Zealand strains are not identical.⁵⁷⁹ They are, however, sufficiently similar as to both be

⁵⁷⁶ For example one strain sampled in 2016 (HL10) differs from the reference strain by zero SNPs whereas another strain also sampled that year (HL13) differs by 22 SNPs from the reference sample. This substantial variation means the time-scale of Psa3 evolution cannot be reliably estimated from this data.

⁵⁷⁷ New Zealand's eight SNPs and M7's twelve SNPs .

⁵⁷⁸ All of the 83 New Zealand strains analysed had an ICE. Dr Poulter estimates that around 75 of these strains have PacICE1. The rest have obtained another ICE which provides resistance to copper. There are a limited number of integration sites for ICEs. If a bacteria acquires a copper resistant ICE, it would be taking the place of PacICE1. Copper has been sprayed on other crops in New Zealand over the last 50 years and other bacteria have acquired copper resistant ICEs. The New Zealand Psa strains have likely horizontally acquired the copper resistant ICE and replaced PacICE1 with it.

⁵⁷⁹ Of the 100,903 base pairs in PacICE1, there is one difference. This difference is that the New Zealand PacICE1 has an IS element added into it ("jumping genes"). There are, however, no SNP differences between M7's PacICE1 and the New Zealand version.

PacICE1 differing at only one point in the 100,903 base pairs. PacICE2 and 3 are materially different.⁵⁸⁰

[1198] The question is whether the presence of PacICE1 in M7 and the New Zealand strains provides evidence of an association between the M7 strain and the New Zealand incursion. On its own it does not. That is because of its ability to transfer horizontally⁵⁸¹ and its ephemeral nature.⁵⁸² On its own all it says is that at some point the New Zealand lineage acquired PacICE1 and, similarly, at some point the M7 strain acquired PacICE1. It is not possible to say whether they acquired PacICE1 vertically from a common ancestor that had acquired PacICE1 or whether they each acquired PacICE1 independently. It is therefore not included in a phylogenetic tree which is constructed on the basis of stable inherited characteristics.⁵⁸³ This is accepted by Dr Poulter.

[1199] This leads to the question of whether the presence of PacICE1 in Psa is sufficiently unusual such that it would be an unlikely coincidence if the M7 strain and the New Zealand strain were not related.⁵⁸⁴ Dr Poulter considers PacICE1 in Psa is exquisitely rare. In his words, he regards the presence of PacICE1 in the Shaanxi strain from 2010 and the New Zealand strains in 2010 as providing “evidence of the strongest kind” linking them.⁵⁸⁵ This is because no one has found any evidence of PacICE1 in China other than in Shaanxi in 2010. He regards this as “a diagnostic statement of great clarity”.

⁵⁸⁰ The European strains have PacICE-2 which has about 1000 SNPs distinguishing it from PacICE1 in the New Zealand strains. The Chilean strains have PacICE-3 (that is, a third distinct ICE). Dr Poulter considers these strains have acquired these ICEs recently from some other bacteria species altogether.

⁵⁸¹ Horizontally transferred ICEs have different evolutionary histories to the vertically inherited core genome.

⁵⁸² They are frequently subject to rearrangement, capable of recombining with other ICEs and exchanging accessory genes. ICE exchange may occur in as little as 30 minutes.

⁵⁸³ As Dr McCann puts it, phylogenetic trees are built from the core genome. ICEs are not part of the core genome. They are also not part of the accessory genome. It is common practice to exclude ICEs when reconstructing evolutionary relationships between bacterial strains because of their ephemeral nature and ability to transfer horizontally.

⁵⁸⁴ This is because it would mean that M7 and the New Zealand foundation strain had independently come into contact with bacteria containing the same (rare) PacICE1.

⁵⁸⁵ Note, contrary to how Professor Holmes and Dr McCann may have initially understood Dr Poulter’s view, he is not saying that the strains isolated from an orchard in Shaanxi in 2010 is the ancestor of the New Zealand, Italian and Chilean Psa3 strain. He says it is likely that their common ancestor is from Shaanxi.

[1200] Dr Poulter considers that the acquisition of ICEs is not a random low probability event similar to a SNP change. An ICE element depends on whether the ICE is present in the relevant physical environment/microbiome. He says there is now considerable sampling of Chinese Psa3 from Shaanxi, Sichuan, Anhui, Hunan, Hubei, Guizhou, Shanghai, and Chongqing but PacICE1 has only been found in Shaanxi in strains isolated in 2010. As Shaanxi is the hub of kiwifruit production and kiwifruit pollen production in China, Dr Poulter considers it is likely that any strain present in Shaanxi would become widely distributed within China. As PacICE1 has not been found in the other, mostly later, Chinese samples Dr Poulter suggests that PacICE1 was present in Shaanxi at a particular time.

[1201] Dr McCann considers no reliable inference can be drawn from the presence of PacICE1 in M7 and the early New Zealand strains. Dr McCann also notes that PacICE1 present in the Shaanxi strain⁵⁸⁶ is not identical to the PacICE1 in the early New Zealand Psa3 strains. I do not regard this as a strong point against Dr Poulter's view. As he has explained, the PacICE1 in M7 and the New Zealand PacICE1 differ in a minor way. That minor difference is not unexpected if M7 and the New Zealand strains each derived PacICE1 from a common, recent ancestor. I agree with Dr Poulter that the substantial ICE diversity in other strains suggests M7 and the New Zealand strains may possibly share a closer link than the New Zealand strains do with those other strains.⁵⁸⁷

[1202] Dr McCann says near identical ICEs may be present in distantly related strains isolated from different plant hosts in different parts of the world, decades apart. PacICE1 has been isolated in hazelnut from Italy in 1991, in larkspur in New Zealand in 1957, and in ryegrass from Japan in 1967.⁵⁸⁸ Similarity between mobile elements and different genomes may arise simply by chance acquisition from different external sources and does not reflect common ancestry. This is demonstrated by the fact that Dr McCann has found PacICE1 in the non-New Zealand derived Korean Psa3.⁵⁸⁹ It

⁵⁸⁶ M7, also described as CH2010-6, Psa_CH20106, C1.

⁵⁸⁷ Dr McCann noted there is substantial ICE diversity in Shaanxi. Psa3 isolated in Shaanxi includes two divergent strains harbouring two distinct ICEs, and three pandemic strains with three distinct ICEs. ICE diversity is also observed in other Chinese provinces.

⁵⁸⁸ ICE exchange has also been demonstrated to occur in the laboratory between even distantly related strains of *Pseudomonas syringae*.

⁵⁸⁹ The SNP analysis makes it clear this Korean Psa3 is not from New Zealand.

is possible that PacICE1 has horizontally transferred from the New Zealand derived Korean Psa3 (if they have come into close proximity) but it is also possible it has acquired PacICE1 independently. Either way the presence of PacICE1 in the non-New Zealand derived Korean Psa3 does not assist with the ancestry of that non-New Zealand derived Korean Psa3.

[1203] Because PacICE1 is mobile and can be horizontally acquired by chance, the sampling size is important. Dr McCann considers the number of Chinese pandemic lineage strains that have been sequenced is small. This makes it difficult to exclude alternate hypotheses on the origin of New Zealand Psa.

[1204] Professor Holmes agrees with this. He says it is scientifically incorrect to rely on ICE elements in phylogenetic analysis. These elements are unreliable phylogenetic markers because of the frequency with which they can move between strains (that is, horizontally transfer). He considers Dr Poulter's sampling has a marked geographical bias because most of the strains are from New Zealand. There is also a strong temporal bias because of the small number of strains analysed from 2010 and because none were from the critical period prior to 2010. These sampling biases greatly limit any attempt to infer the origins of Psa3 present in 2010. Further, even if the common ancestor of the 2010 Shaanxi and New Zealand isolates had PacICE1, there is no evidence the ancestor existed in Shaanxi province because the geographic and temporal sampling is insufficiently broad.

[1205] One of Dr Poulter's responses to these points is that ICEs are not so ephemeral that they disappear all over the place. All the 83 New Zealand strains have an ICE. Around 75 of them have PacICE1. The only ones that have lost PacICE1 have acquired another ICE. That new ICE provides copper resistance and has replaced the PacICE1.⁵⁹⁰ None of the New Zealand strains studied have lost their ICE altogether. Further, the New Zealand strains have passed on PacICE1 to the Korean strains derived from New Zealand.

⁵⁹⁰ There are a limited number of integration sites for ICEs. If a bacterium acquires a copper resistant ICE it would be taking the place of PacICE1. Copper has been sprayed on other crops in New Zealand over the last 50 years and other bacteria has acquired copper resistance ICE. The New Zealand Psa strains have likely horizontally acquired the copper resistant ICE and replaced PacICE1 with it.

[1206] I do not regard this as a complete response. All it tells us is that in New Zealand PacICE1 has been stable. It has been retained by the New Zealand strains unless a better ICE has come along. It has also been retained in Korea. That does not tell us how the foundation New Zealand strain acquired PacICE1 and whether it acquired it in New Zealand or elsewhere. Nor does it tell us whether it was stable in China for a period and for how long.

[1207] Dr Poulter also says there now has been analysis of a large number of samples from China. As between Dr Mazzaglia, Dr Poulter and Dr McCann, 61 strains from eight provinces have been analysed. The 2010 strain from the orchard in Dandong remains the only strain to have Pac ICE1. It is not in Europe or Chile and its presence in Korea and Japan can be explained by the presence of the New Zealand derived strains in those countries.

[1208] I accept Professor Holmes evidence that there are geographical and temporal issues with the sampling.⁵⁹¹ The 61 Chinese strains referred to in the plaintiff's submissions appear to overstate the number because this includes strains that were not fully sequenced.⁵⁹² Even with the 61 strains now available from China, the number seems small relative to the size and geographic spread of the kiwifruit industry. It is apparent this is just a fraction of the sampling that could be done. Dr McCann would like to do further sampling. She says Shaanxi has not been sampled intensively and she has not personally been in a position to do this. She considers it is not known how abundant or rare PacICE1 in kiwifruit is on the basis of the samples analysed to date.

[1209] Dr Poulter also makes the point that of all the other *Pseudomonas syringae* sequenced in GenBank the most recent PacICE1 was found in 1957 for a delphinium

⁵⁹¹ His evidence initially referred to the geographical and temporal limits of Dr Poulter's initial analysis of the strains as identified in his Schedule 1. Dr Poulter also, however, analysed the strains that the other experts had analysed. Nevertheless I understood Professor Holmes to consider that the geographical and temporal biases remained.

⁵⁹² This is the maximum number that may have been fully sequenced. The evidence about this was unclear. The experts were not clear about who had sampled what. Dr McCann said that Chinese Psa3 has not been comprehensively sampled. Approximately 30 Chinese whole genome sequences are available, of which only four are from Shaanxi (and three are from the same orchard on the same day), compared with over 100 New Zealand sequences. China is 36 times bigger than New Zealand and Shaanxi is about three-quarters of the size of New Zealand.

in New Zealand. This is an extensive database extending back at least 60 years. However Dr Poulter also accepted that no one knows how rare it is in other species, for example *Pseudomonas syringae* in hazelnuts, because no one has isolated 20, 30 or 40 of them to find out. As Dr McCann puts it, the DNA sequences in GenBank are a small fraction of the extent of diversity in microbes and there is no real knowledge of the true host range of ICEs and *Pseudomonas*.

[1210] I accept it is not possible to draw a safe inference from the sampling to date about how rare PacICE1 is in China or elsewhere. If PacICE1 is not rare, independent horizontal acquisition of PacICE1 may well explain its presence in M7 and the New Zealand outbreak.

[1211] Nevertheless, it is a fact that the first identified New Zealand strains have PacICE1. It is a safe inference that the New Zealand foundation strain, likely to have entered New Zealand in 2009 or early 2010, had PacICE1. That ICE is almost identical to the PacICE1 in M7, which is from Shaanxi in June 2010. Either the ancestors of the M7 and New Zealand foundation strain came into contact with bacteria containing near identical PacICE1 in separate and unlinked places or their ancestors were geographically linked in some way.

[1212] In summary, it is reasonably possible and plausible they share a recent common ancestor that acquired the PacICE1. Nevertheless it also remains possible that this is no more than an unconnected coincidence. On its own, therefore the presence of PacICE1 is not sufficiently reliable to establish that the New Zealand Psa3 incursion came from Shaanxi. It is, however, a factor that can be taken into account when assessing the strength of the link between Shaanxi and the New Zealand Psa3 outbreak. In this civil context the question is not what is proven as a matter of scientific certainty nor whether it would be included in one of the publications that Professor Holmes edits and contributes to. The presence of PacICE1 in the Shaanxi and New Zealand strains is a “strand” that is established. It is also established that its presence in both strains could be explained by them sharing a recent common ancestor, although there are also other possible explanations. This “strand” can be added to the other “strands” in the cable of circumstantial evidence that as a whole must be considered.

Does Dr Mazzaglia's analysis add to the weight of the "genetic" link

Summary of Dr Mazzaglia's analysis

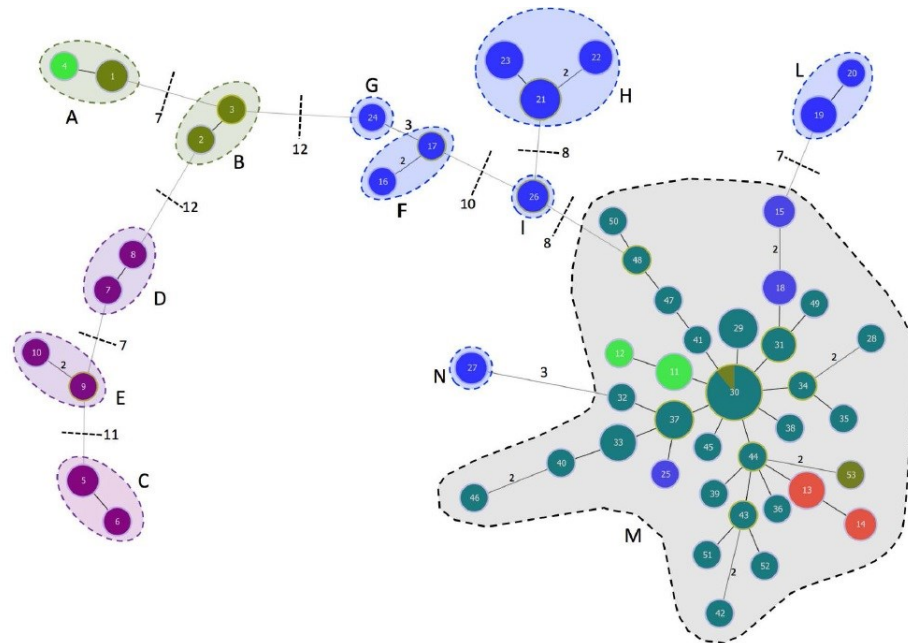
[1213] The objective of Dr Mazzaglia's MLVA analysis was to provide an efficient cross-check on Dr Poulter's WGS analysis. His analysis was carried out on 132 Psa strains comprised as follows:⁵⁹³

- (a) China: 33 strains from 10 different areas. Of these seven are from Shaanxi from 2010. These include the strain CH2010-6 (also known as M7). The rest are from 2012 and 2013.
- (b) New Zealand: 71 strains mostly from Te Puke. They cover the period from the initial infection in 2010 through to the current date.
- (c) Europe: six strains, including one from Latina, Italy from 1992 and one from Veneto, Italy from 2008.
- (d) Japan: nine strains, five of which are from the Psa3 outbreak in Japan in 2014.
- (e) Korea: seven strains from dates between 2008 and 2013.
- (f) Chile: six strains from dates between 2010 and 2013.

[1214] Dr Mazzaglia analysed the number of tandem repeats at each loci for all 132 isolates.⁵⁹⁴ The 132 isolates generated 53 different haplotypes. Haplotypes can be further grouped into clonal complexes. Dr Mazzaglia's analysis showed 12 distinct groups/clonal complexes, each group having a maximum of two differences in the 19 loci studied. This is shown in the following diagram:*

⁵⁹³ The DNA from these strands was isolated by Dr Mazzaglia's laboratory and the laboratory at Otago University.

⁵⁹⁴ For example the tandem repeats for CH2010-6 (M7) at each loci were 8, 10, 3, 4, 4, 1, 3, 5, 13, 4, 5, 17, 1, 5, 2, 2, 2, 3, 3, 3, 3.



*Note (as explained by Dr Mazzaglia) the colour code going from a semi-circular left to right is: Korea (purple); Europe (light green); Japan (olive green); China (blue); New Zealand (dark green); Chile (red).

[1215] Of particular interest is Dr Mazzaglia’s “M” clonal complex. This complex has strains from New Zealand and China (isolated in 2010 and one from Anhui isolated in 2013), as well as some strains from Japan, Europe (including Italy) and Chile. This grouping corresponds with Psa3.

[1216] All of the New Zealand strains fall into the “M” clonal complex. Within this clonal complex, they fall into a number of haplotypes. Ten of the 71 New Zealand strains were isolated in 2010. These ten belong to two haplotypes: HT30 (nine strains) and HT31 (one strain). They have a high degree of genetic homogeneity.⁵⁹⁵ Dr Mazzaglia considers this supports the hypothesis of a strictly clonal origin of this epidemic, most probably referable to a single infective event in the Te Puke area.

[1217] Among all the 71 New Zealand strains, the haplotype HT30 is by far the most abundant and diffused. This corroborates the hypothesis that HT30 was predominant at the beginning of the outbreak, and also progressively evolved. Dr Mazzaglia considers this is consistent with the infection having taken hold in the region and expanding quickly. Mutations are prevalent out of Te Puke, which accords with the natural process of evolution.

⁵⁹⁵ They diverge only in one locus on 23 and by only one sequence repetition (nine repeats in HT30 vs 10 repeats in HT31).

[1218] The Chinese strains fall into seven different clonal complexes.⁵⁹⁶ This significant genetic variability probably can be explained because China has the largest kiwifruit production globally. Six of the 33 strains fall into the “M” clonal complex (that is the same complex all the New Zealand strains are in). The six strains are comprised of five strains from Shaanxi (Baoji) isolated in 2010 and one from Anhui isolated in 2013. The five Shaanxi strains are represented by two haplotypes: HT18 (strains CH2010-5, CH2010-6/M7 and CH2010-7) and HT15 (strains M23 and M122). They are well correlated to the two haplotypes of the 2010 New Zealand strains, HT31 and HT30. More particularly, they are primarily linked to HT31 from which they differ by one repetition at a locus.⁵⁹⁷

[1219] The European samples fall into two clonal complexes one of which is the “M” complex. Within this complex they fall into two haplotypes: HT11 and HT12. These are less closely linked to the 2010 New Zealand strains, because the closest of them differs by 8 repetitions at a locus.⁵⁹⁸ Differences of this much are more significant because repetitions tend to accumulate over time. In other words it takes longer for these differences to occur.

[1220] The Japanese samples fall into the “M” complex and two other complexes. In the “M” complex, are Japanese samples from a Psa3 outbreak in 2014. This fits perfectly with HT30. A plausible explanation is that the outbreak in Japan originated in New Zealand.

[1221] The Chilean samples fall into the “M” clonal complex and are in two haplotypes. Like the European strains in the “M” complex, these are less closely linked to the 2010 New Zealand strains.

[1222] The Korean samples fell into three different complexes. None of them fell within “M”.⁵⁹⁹

⁵⁹⁶ They include, for example, two further strains from Shaanxi (Xiangyang and Baoji) isolated in 2010, which fall within the clonal complex named “F” by Dr Mazzaglia.

⁵⁹⁷ VNTR locus Psa05.

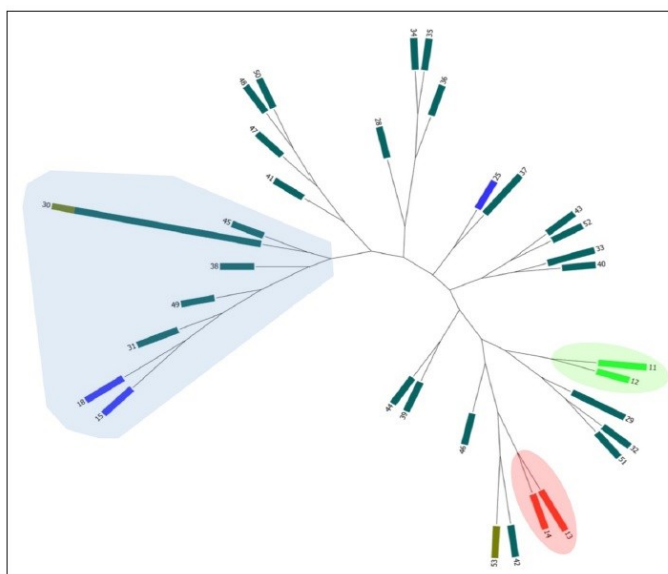
⁵⁹⁸ Five repeats in HT11 versus 13 repeats in HT30 at VNTR locus Psa10.

⁵⁹⁹ This suggests the samples from Korea were Psa infections not linked to/caused by the New Zealand outbreak.

[1223] These differences are shown in the following table.⁶⁰⁰

“Shaanxi” HT18	8	10	3	4	4	1	3	5	13	4	5	17	1	5	2	2	3	3	3	3
“New Zealand” HT31	8	10	3	5	4	1	3	5	13	4	5	17	1	5	2	2	3	3	3	3
“New Zealand” HT30	8	9	3	5	4	1	3	5	13	4	5	17	1	5	2	2	3	3	3	3
“Japanese” HT30	8	9	3	5	4	1	3	5	13	4	5	17	1	5	2	2	3	3	3	3
“European” HT11	8	9	3	5	4	1	3	5	5	4	5	17	1	5	2	2	3	3	3	3
“Chilean” HT13	8	9	3	5	4	1	3	5	10	4	5	16	1	5	2	2	3	3	3	3

[1224] These associations can also be illustrated as follows.*⁶⁰¹



*The colour code is the same as before.

[1225] Dr Mazzaglia says the data analysed does not enable a conclusion about the geographic origin of the first New Zealand strains with absolute certainty. However the analysis does show that the 2010 strains from Shaanxi are the genetically closest group to the first New Zealand strains. They are much closer than the European or Chilean strains. It is his view that those strains are probably the consequence of independent infection events, possibly also from China.

Summary of Dr Mazzaglia’s conclusions

[1226] In summary, Dr Mazzaglia considers:

⁶⁰⁰ Each column represents a locus. The yellow shading is the loci where the number of repetition changes from Shaanxi HT18. The difference of one as between HT18 (Shaanxi) and HT31 (New Zealand) is in the fourth column. The difference of eight as between HT30 (New Zealand) and HT11 (Europe) is in the ninth column.

⁶⁰¹ Described as figure 6, but meant to be figure 5, in Dr Mazzaglia’s brief.

- (a) A single infective event resulted in the New Zealand Psa3 epidemic.
- (b) The European and Chilean outbreaks were caused by independent infective events, distinguishable from the New Zealand one.
- (c) China is the most likely origin of the pandemic lineage of Psa3. This is because:
 - (i) the natural areas of origin of almost all *Actinidia* species are limited to China;
 - (ii) Psa3 shows its greatest variability in China;
 - (iii) reports of aggressive Psa in China are earlier than in other countries (there are no reports of Psa3 in other countries before 2008);
 - (iv) kiwifruit is not an endemic plant in Europe, Chile and New Zealand;
 - (v) the orchard management in Europe, Chile and New Zealand has led to prompt reports when the aggressive Psa3 has caused the first observable symptoms. Based on the biological knowledge of the pathogen, infection events could not have preceded the appearance of symptoms by more than one year;
 - (vi) the same observations apply to Japan and Korea where orchard management is also meticulous;
 - (vii) these factors, which are based on public data and Dr Mazzaglia's experiences and observations, make it "extremely improbable" that the aggressive Psa3 (the pandemic lineage) was present in Europe, Chile, New Zealand, Japan and Korea without being noticed and reported; and

(viii) this leads to Dr Mazzaglia’s opinion that pandemic Psa3 did not evolve in these countries (Europe, Chile, New Zealand, Japan and Korea).

(d) The Shaanxi strains are not identical to the original nucleus of the New Zealand infection but are very close relatives of it.

Critique of conclusions

[1227] Dr Mazzaglia’s analysis is that the Shaanxi strains are genetically the closest group to the New Zealand strains. This conclusion is challenged on the basis that MLVA is less accurate than WGS and on the limited number and range of the samples analysed.

[1228] Professor Holmes says MLVA has less power to accurately resolve outbreak origins than genome sequencing data because MLVA only considers a relatively small number of the mutations that might be present in a bacterial genome.⁶⁰² It is not sufficiently robust in order to conclude the 2010 Shaanxi isolates are genetically closest to New Zealand’s Psa3 strain. There are also geographical and temporal biases in the samples (New Zealand and Chinese strains are overrepresented and there was an imbalance of samples as between samples from 2010 or before, and samples from after 2010) and the analysis does not have statistical support.⁶⁰³ Professor Holmes also says it is not possible to establish the evolutionary directionality (i.e. which comes first) by the MLVA data alone.⁶⁰⁴ Dr Mazzaglia does not contend otherwise.

[1229] Dr McCann similarly disagrees with Dr Mazzaglia that the 2010 Shaanxi strains are “the genetically closest group” to New Zealand Psa3. She considers this

⁶⁰² MLVA is best thought of as a system for rapid strain “typing” rather than a way of accurately inferring evolutionary origins and relationships. The advantages of MLVA is that it rapid and inexpensive.

⁶⁰³ Professor Holmes also says one of the figures in Dr Mazzaglia’s brief of evidence (not one of the ones reproduced above) lacks statistical support. Dr Mazzaglia says the figure was simply a method of representing the data. This does not impact on any of his conclusions.

⁶⁰⁴ Professor Holmes also says the data does not provide evolutionary directionality. It is not possible to tell from the data whether Psa3 transferred from China to New Zealand, from New Zealand to China or were independently derived from another locality. This is a comment based on pure phylogenetics. It does not take into account other information, such as where Psa3 symptoms were first reported.

conclusion was strongly weighted by the set of samples available to Dr Mazzaglia, the acknowledged limitations of MLVA relative to WGS and the absence of corresponding genome sequences for most of the Chinese strains listed.

My assessment

[1230] I accept Dr Mazzaglia has endeavoured to provide a fair selection of samples for this analysis.⁶⁰⁵ However I also accept Professor Holmes' view that a wider selection of samples from countries other than New Zealand and from before 2010 (had they been available) would have strengthened the analysis. I also accept there are limitations in the MLVA method, relative to WGS. However, as Dr Mazzaglia said, the MLVA method is not "garbage". The method focuses on areas of the genome of particular interest. Dr Poulter agrees that particular SNPs may be of more importance than others.⁶⁰⁶ As he explained, MLVA relies on mutations being more likely to occur in the replication of the tandem repeat part of the genome. In other words, you can get a "better run for your money" when strains are closely related. Dr Mazzaglia's analysis provides information about genetic relationships and possible evolutionary pathways and is intended to provide additional supportive evidence to other genetic analyses such as WGS. I accept Dr Mazzaglia's evidence in that light. On its own it does not establish the origin of New Zealand's Psa3, but it is relevant evidence which sits alongside other evidence.

[1231] Dr Mazzaglia is a well-regarded expert who has been researching Psa for some time. Despite acknowledging that WGS is a superior tool to MLVA and having considered the briefs of evidence of Dr McCann and Professor Holmes, he nevertheless agrees with Dr Poulter that Shaanxi is the probable origin of New Zealand Psa3. In doing so, like Dr Poulter, he has taken into account other relevant context about Psa. That context is within his expertise. I consider Dr Mazzaglia's

⁶⁰⁵ Dr Mazzaglia says his New Zealand samples were intended to provide the widest possible representation of the New Zealand position since 2010. For the other areas of Psa outbreaks he used similar numbers: Europe (five), Chile (six), Japan (five) and China (33 across 10 regions). He also notes the other experts used a similar number of earlier Psa3 strains.

⁶⁰⁶ I do not accept the plaintiffs' submission that Dr McCann provided her support to Dr Poulter's view that all of the samples sequenced (including all those from other parts of China), except M7, could be eliminated on the basis of a particular SNP meaning that M7 was left as the closest strain to the strain responsible for the New Zealand outbreak.

analysis is a factor that can be taken into account, which adds to the weight of the genetic link between the New Zealand outbreak and Shaanxi.

Further support for the link

[1232] Shortly before the trial commenced, the plaintiffs became aware that M7 (also referred to as CH2010-6), being one of the Shaanxi isolates with PacICE1, was from Dandong, a town in Mei County, Shaanxi. There had been literature published in 2015 and 2016 by Dr Huang and others. This said M7 was from Mei County. Shortly before the trial Dr Mazzaglia and Mr Balestra provided to the plaintiffs details they had obtained from Dr Huang in December 2010 about the location of the strain for the purposes of their research. Dr Huang provided details identifying the strain as from Dandong.⁶⁰⁷

[1233] Shaanxi is about 205,800 km² (two-thirds the size of NZ). Mei County is about 863 km². Dandong is 47.5 km from Orchard 1. Dr Poulter did not learn of this geographic proximity until part-way through the trial (about four to six weeks before he gave his evidence). He had therefore not known of this connection when he carried out his analysis that had concluded that the mostly likely origin of the New Zealand Psa3 strain was Shaanxi.

[1234] In other words, there was Psa3 in November 2010 in a place less than 50 km from the place where the anthers were obtained in 2009. That Psa3 strain happens to be a close relative of the New Zealand strain as well as having the same PacICE. That adds some support to the link

Conclusion

[1235] On the basis of the genetic evidence, it is more probable than not that the origin of the New Zealand incursion is from China. It is reasonably possible the strain that infected New Zealand came from Shaanxi. It is likely that a single recent event was responsible for the New Zealand incursion. A timeframe of around one year from infection to the first symptoms is reasonably possible on the genetic evidence

⁶⁰⁷ An objection to this evidence was made by the defendant but later withdrawn.

(Poulter), is “about right” (Holmes), is supported by biological knowledge of the pathogen (Mazzaglia) and is consistent with Dr McCann’s view that it was “recent”.

Other matters

[1236] The plaintiffs adduced statistical modelling evidence to support their contention that the Psa3 outbreak came from the June 2009 anthers consignment. Professor Curran carried out classical statistical modelling to determine the boundary ranges of dates within which Psa first began reproducing in New Zealand. The modelling is based on the rate of genetic mutation over time. On the basis of the modelling, Professor Curran concluded that Psa3 likely began reproducing sometime between May-June 2009 and July-August 2010. This timeframe is consistent with the June 2009 anthers consignment being the source of the disease outbreak.

[1237] The defendant submits this evidence should be rejected because it was based on incomplete data and incorrect assumptions. He also submits this evidence does not provide any certainty about the timing of when Psa3 entered New Zealand because it is consistent with Dr Vanneste’s timeframe and that of the plaintiffs’ experts.

The statistical evidence

[1238] The statistical evidence was presented by two key witnesses:

- (a) Dr James Curran: a Professor of Statistics at the University of Auckland. He has a PhD in statistics and has held tenured academic positions since 1999. He has particular expertise in the field of statistical analysis and interpretation of forensic trace evidence and forensic genetics.⁶⁰⁸
- (b) Dr David Bryant: a Professor of Mathematics at the University of Otago. He has a PhD in Mathematics writing about the theory and methodology of the evolutionary analysis of genetic data. He has 20

⁶⁰⁸ Forensic human genetics is more concerned with DNA evidence for the purposes of criminal investigation and litigation. However, he said he has particular experience in statistical analysis for the purpose of assessing the weight of evidence.

years' post-doctoral experience working on mathematical, statistical and computational aspects of evolutionary biology.

[1239] Professor Bryant was asked by the defendant to give his expert opinion on the robustness of the method used by Professor Curran in his statistical analysis and evaluate the weight that should be given to his conclusions in light of the methods employed. His criticisms of Professor Curran's analysis and Professor Curran's responses were as follows:

- (a) Assumption of statistical independence: Professor Bryant said that an implicit assumption in the models employed by Professor Curran is that each data point is statistically independent of all of the others. He said this was an incorrect assumption because evolutionary relationships generally exist between different samples of the same strain of bacteria.⁶⁰⁹ This means that double counting can occur.

Professor Poulter's evidence was that the number of shared SNPs in each data point was less than 3 per cent of the total SNPs in the genome data provided to Professor Curran. Based on this Professor Curran considered this was not material to the analysis because the extent of dependence was not high.

- (b) Methodological shortcomings: while Professor Bryant recognised that the models used by Professor Curran were within standard statistical practice, he said there are other models and techniques within evolutionary biology which are widely accepted, that employ non-linear methods that could fit the data better. However, Professor Bryant did not conduct any statistical analysis to show whether these models would in fact fit the data better.
- (c) Deleterious mutations: Professor Bryant also questioned Professor Curran's analysis because of the possibility that some of the SNPs in

⁶⁰⁹ The effect of interdependence is that each sample does not represent totally new information for the purposes of analysis.

the data set would die out through the existence of deleterious mutations. The presence of these samples within the dataset could affect the validity or certainty associated with the ultimate regression modelling. For example, if there are a large number of deleterious mutations then this could bias the conclusions towards seeing larger confidence intervals.

Professor Bryant did not carry out the analysis to determine whether this was an issue in this case. Moreover Professor Curran did not have the opportunity to respond to this criticism in either written or oral evidence. The extent of the cross examination on it was as follows:

Q. And did you take into account for example whether some of the more recent isolates have deleterious mutations. Those isolates are going to die out because of the mutations they have suffered?

A. No.

Q. I understand that it is possible in real time assessment like this that some of the more recent isolates have mutations that may not assist because they have damaged bacteria. Is that something that you have taken into account?

A. I am not sure why you are asking me that, sorry.

[1240] I accept Professor Curran's response to the first point. He is a well-qualified statistician and has used widely accepted models. That there may be a better model does not assist when analysis under that model has not been carried out. I also accept his response to the interdependence issue. Again, Professor Bryant has raised the issue but he was not aware of the extent to which there had been interdependence. Professor Curran has done the analysis and is satisfied the interdependence would not have had any significant effect. Lastly, I give no weight to the deleterious mutations point which was advanced by the defendant as a possible issue only and not in a way that enabled Professor Curran to fairly respond.

[1241] Accordingly I accept that the statistical evidence providing a likely timeframe of when Psa reproduction began of between May 2009 and August 2010 is a further strand that supports the plaintiffs' case that the Psa3 incursion came from the June 2009 anthers consignment.

MAF's views

[1242] MAF investigators spent considerable time and resources investigating when Psa3 arrived in New Zealand and where it had come from. It has consistently suspected that it came from pollen imported by Kiwi Pollen.

[1243] MAF witnesses such as Ms Pearson and Dr Butcher confirmed that pollen was a major focus of the MAF investigation.

[1244] MAF's conclusion contained in its Pathway Tracing Report (as at 5 December 2011) was:

The analysis undertaken by MAF indicates that it is most likely that Psa V arrived in New Zealand no more than 18 months before the first symptoms were observed on kiwifruit in October 2010. The initial infection probably arose from a single point of introduction at or close to the area where the first infected vines were identified. Psa V could have arrived in New Zealand from any of the European countries where it is found, or alternatively, from another country where it is present but this presence has yet to be confirmed.

[1245] As to pollen it said:

Whilst MAF has assessed the overall risk from imported kiwifruit pollen and from pollen trials as uncertain but probably low based on current information, we cannot rule it out. Further information about the viability of Psa V associated with pollen and about the presence or absence of Psa V in other countries would assist any future reassessment of risk from these pathways.

[1246] The report did not identify any more likely source. MAF personnel were also, at this time, cognisant of the risk of claims if the report was released.⁶¹⁰

[1247] In September 2012 MAF was carrying out work on developing a new IHS for commercially prepared pollen for artificial pollination which said:

While the Psa incursion could not be directly attributed to any particular pathway, at this stage it is considered that the import of contaminated pollen

⁶¹⁰ This was the subject of internal communications within MAF. These concerns were expressed in light of recent diagnostic reports from Landcare Research that the second shipment of Chinese pollen imported by Kiwi Pollen had tested positive for Psa. The decision was made to release the report publicly. Industry members were unhappy that the report was not updated to refer to the Landcare Research. This and other concerns led to the commissioning of the Sapere Report which made recommendations to MAF about its processes but tracing issues were expressly excluded from the terms of reference.

to apply to orchards is the most likely pathway for the entry and establishment of Psa in New Zealand.

[1248] This proposed new IHS was put in abeyance.

Kiwi Pollen's second Chinese shipment tested positive for Psa3

[1249] On 6 December 2012 MAF confirmed earlier preliminary testing results of the Chinese pollen sample obtained from Kiwi Pollen. This sample was from the second Chinese consignment imported by Kiwi Pollen (that Ms Hamlyn had described as “dead”). This testing confirmed the presence of Psa3. The Minister was briefed about this test result. The Minister was also informed that a group of post-harvest operators had publicly discussed a possible class action. The Minister was advised that this new information would be of interest to that group, but imported pollen from China was just “one of several possible pathways by which Psa-V could have entered New Zealand”.

No other plausible theory

[1250] At the pre-trial stage the defendant was directed to plead an alternative theory if he had one. The defendant has been up front that he does not have one. Nor is there any support for an alternative theory in the evidence. The Pathway Tracing Report assessed a range of other pathways as “negligible” (legal import of budwood and tissue, seed and fruit) and “low” or “probably low” (illegal imports of kiwifruit plant material, imports of orchard equipment, people movement and research activities). MAF traced all imports of kiwifruit plant material for the purposes of this report. Plants and equipment were inspected and tested. None showed symptoms of Psa or tested positive for it. There was some general evidence about tourist visits to orchards, but these were not analysed by Dr Vanneste or other defence witnesses for their plausibility. The defendant’s position is that it will never be known how Psa entered New Zealand. While it may never be proven to a level of complete certainty, that is not the test in a civil claim.

Conclusion

[1251] In my view, following the Psa3 incursion MAF's approach to whether the June 2009 anthers consignment was the cause of that incursion was to look for proof to a level of scientific certainty. To some extent, the defendant's evidence and submissions on this aspect of the case, reflected that approach. Proof to that level is rarely possible when dealing with the reconstruction of past events. All the more so when the cause of the outbreak is a relatively new pathogen that behaves differently depending on a number of environmental and host factors. Proof to absolute certainty is not required in a civil case. The question is whether the plaintiffs have established it is more likely than not that the June 2009 anthers consignment was the source of the outbreak.

[1252] The plaintiffs' case is a circumstantial one. It involves looking at all of the circumstances that have been established, what factors point away from the inference the plaintiffs ask the Court to draw from them and what other explanation might fit the circumstances. The Court must stand back and look at the picture as a whole and determine whether it is satisfied, on rational and objective grounds, that the case for believing the June 2009 anthers consignment was the cause of the incursion is stronger than the case for not so believing.

[1253] I am satisfied the plaintiffs have discharged this burden. In summary that is because:

- (a) It is likely the incursion was caused by a single event (based on the genetic evidence and supported by the epicentre and spread of the symptoms as reported and the ability of the pathogen to behave in this way).
- (b) It is likely that single event was recent (based on the genetic evidence and the expert views on the time to symptoms from exposure to the pathogen).
- (c) The timing of that event can be narrowed down to less than five years from November 2010 (based on the genetic evidence), but it is likely that Psa3 began to multiply in New Zealand closer to one year (or

thereabouts) before samples of vines were taken for testing in early November 2010 (based on the genetic evidence, the scientific opinions about the behaviour of the pathogen and the statistical evidence).

- (d) It is likely that Psa3 began to multiply somewhere close to or at the Kairanga and Olympos orchards (based on where the symptoms were first reported, the extent of those symptoms when discovered in early November 2010 and its subsequent spread as reported and discovered at other Te Puke orchards and beyond).
- (e) The June 2009 consignment of anthers could have been the host for the Psa3 incursion because Psa3 can live in anthers, it could survive the means by which it was transported from the orchard in Shaanxi to Kiwi Pollen's premises in Te Puke, and Psa3 can survive being milled into pollen as well as in the resulting anther debris (based on the expert scientific evidence about the pathogen and scientific testing).
- (f) If Psa3 was in the consignment there are multiple pathways by which it could have infected Kairanga and Olympos orchards. It is not possible to say which of those pathways occurred or to be absolutely certain that any of them did from the evidence about what occurred. However the range of possible pathways are consistent with the symptoms that were discovered at those orchards in October and November 2010. These pathways range from exposure by one or both of those orchards to a small level of Psa3 in spring 2009 to exposure to a high level of Psa3 in early October 2010. Some of these pathways are less likely than others especially if Ms Campbell's and Mr Crawshaw's recollections about when they noticed the damaged vines in spring 2010 is correct (that is, before artificial pollination on Kairanga) and if all the canisters used to pollinate Olympos in spring 2010 were tested comprehensively and reliable. Nevertheless, even if those pathways were excluded, there remain multiple pathways by which Olympos and Kairanga could have been infected by Psa3 from the anthers or the pollen obtained from those anthers.

- (g) The origin of the particular strain of Psa3 that entered New Zealand is probably China (based on the genetic evidence, where and when Psa3 has been reported in China and other countries, and that the only other consignment of pollen from China imported into New Zealand, and by the same importer of the anthers, tested positive for Psa3).
- (h) It is quite possible and plausible that the Psa3 incursion in New Zealand came from Shaanxi province:
 - (i) On the basis of the genetic evidence it is a close relative of a strain of Psa3 found in Dandong, Mei County, in the Shaanxi province in November 2010 (albeit that it is also a close relative to other Chinese strains). Dandong is less than 50 km from the orchard where the anthers came from.
 - (ii) It is also reasonably possible and plausible that the strain of Psa3 found in Dandong and the New Zealand strain share a close relative on the basis that they share a genetic mobile element (PacICE1) and because of their similarities in the part of the genome targeted in the MLVA analysis (albeit it is also possible that they coincidentally but independently acquired PacICE1 and that the particular similarities from the MLVA analysis are also coincidental).
- (i) There is no other known source for the incursion. Other conceivably possible pathways are unlikely and there is no evidence to suggest they in fact happened.

[1254] I therefore conclude it is more likely than not that Psa3 entered New Zealand through the June 2009 anthers consignment.

Part 7: Crown immunity

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Introduction

[1255] If the plaintiffs can establish that a duty of care was owed, which was breached and which caused them loss, the defendant contends the Crown has a complete defence to the claim. He says this is because:

- (a) MAF personnel have the benefit of a statutory immunity conferred under s 163 of the Biosecurity Act 1993. This immunity applies to MAF personnel unless they have acted in bad faith or without reasonable cause. A negligence claim does not involve a claim of bad faith or acting without reasonable cause.
- (b) The Crown is not vicariously liable for the actions of MAF personnel because, pursuant to s 6 of the Crown Proceedings Act 1950 (the CPA), it has the benefit of the s 163 immunity conferred on MAF personnel.
- (c) Nor can any claim be made against the Crown directly for its negligence, regardless of the scope of the immunity under s 163. This

is because, pursuant to s 6(1) of the CPA, a tort claim against the Crown can only be for vicarious liability.

[1256] The plaintiffs say s 163 of the Biosecurity Act does not protect MAF personnel from a negligence claim. This is because “without reasonable cause” encompasses “without reasonable care”. They say this means the defendant remains vicariously liable for the negligence of MAF personnel under the CPA. They further say that, even if MAF personnel are protected from liability by s 163 of the Biosecurity Act, this does not protect the Crown from vicarious or direct liability for negligence. This is because the CPA must be given an interpretation consistent with s 27(3) of New Zealand Bill of Rights Act 1990 (NZBORA).

[1257] The issues that arise are:

- (a) What is the proper scope of s 163 of the Biosecurity Act?
- (b) If it protects MAF personnel from liability in this case, does that protect the Crown from vicarious liability because of s 6 of the CPA?
- (c) Can the Crown be liable directly?

Background

Introduction

[1258] The issues to be considered need to be understood in their context. That context involves an understanding of who may be sued in a claim for negligence and how that position is altered when the negligence is asserted against the Crown or Crown employees.

[1259] In a negligence claim, the person who has allegedly breached a duty of care (called the tortfeasor) may be sued for their breach. The law also recognises two other ways in which someone can be liable for the tortious conduct of another. The first is by vicarious liability. Vicarious liability is imposed as a matter of policy. When one person is acting on behalf of another (e.g. employer-employee relationship) the wrong

is seen for the purposes of compensation as having been committed both by the person acting and the person on whose behalf they were acting. This means that, ordinarily, persons who have suffered loss because of a breach of duty can claim against the tortfeasor, or the person/organisation they were acting on behalf of, or they can sue both.

[1260] The second way, called attribution, operates in the case of a corporate body having separate legal existence from its members and employees. Since an organisation with artificial legal personality may only act through its agents, the conduct and state of mind of those agents may be attributed to that of the organisation. Here the organisation is liable because the tortfeasor was acting as the organisation rather than for it.⁶¹¹ The claim can be brought against the organisation directly for the actions of the person or persons whose actions are attributed to the organisation.

[1261] A claim in negligence may also arise where the conduct of an organisation, rather than a particular person or persons within it, is in issue. The negligent conduct might not subsist in one person but might have been the result of the general systems or policies in operation in the organisation, its resourcing, or its perception of priorities.⁶¹² There might also be situations where the conduct of no specific individual is independently tortious but where the acts and/or omissions of numerous people working within one organisation leads to cumulative negligence. This is variously called systemic, institutional, organisational or operational negligence. In such situations, the organisation can be sued directly by those who suffer loss because of its systemic or institutional negligence.

[1262] The law concerning situations where the Crown is the second person is more complicated. This is for two reasons.⁶¹³ First, the statute books are full of provisions that confer immunity or a limitation of liability upon servants or agents of the Crown. These provisions are problematic because the ordinary rules of vicarious liability require that the servant must be independently liable for their wrongdoing to be brought to bear on their master. Secondly, Crown liability is more complicated

⁶¹¹ The different modes of tort liability are summarised by Tipping J at [158]-[161] in *Couch (No 2)*.

⁶¹² See *Couch (No 2)* at [161] per Tipping J.

⁶¹³ These reasons are summarised by Hogg, Monahan & Wright in *Liability of the Crown* (4th ed, Carswell, Toronto, 2011) [*Hogg, Monahan & Wright*] at 182-184.

because it is governed by the CPA. This was enacted almost seven decades ago at a time when the public service was very different to what exists today.⁶¹⁴ The CPA governs how claims may be brought against the Crown. It also contains provisions concerning the conditions on which the Crown's vicarious liability exists and the circumstances in which statutes that negative or limit liability of Crown officers apply to the Crown. In these proceedings, this question is important in determining whether the Crown can have the benefit of the s 163 Biosecurity Act immunity if its servants have it.

*The historic position of claims against the Crown*⁶¹⁵

[1263] Historically the position was that “the King could do no wrong” and the monarch could not be impleaded in his or her courts. This meant there could be no claim against the Crown in tort. The servant or agent of the Crown who committed the tort could be sued, but this was unsatisfactory if the servant or agent could not be identified or could not satisfy judgment. Further, the head of a Crown agency or ministry could not be vicariously liable for the tort of their subordinates on the basis they were servants of the Crown and therefore immune from liability.

[1264] A petition of right procedure mitigated this position. This was first established at common law in the United Kingdom in the 16th century. A petitioner could obtain redress through a declaration of rights. This was not binding but the Crown invariably complied with the decision. In the 19th century this procedure was replaced by statute. However this statute did not provide redress for torts.⁶¹⁶

[1265] As tort actions against the Crown remained barred in the United Kingdom, a practise developed where a nominated defendant would be sued and the Crown would pay “ex gratia” compensation. The Courts were against this practice as the nominated defendant was there for convenience and might not have had any connection with the events at issue.⁶¹⁷ This led to the passing of the Crown Proceedings Act 1947 (UK).

⁶¹⁴ Professor Stuart Anderson “Grave Injustice, Despotic Privilege: The Insecure Foundations of Crown Liability for Torts” (2009) 12 Otago Law Review 1 [*Anderson*] at 21.

⁶¹⁵ *Todd on Torts* at [23.1]; and Anderson.

⁶¹⁶ Petitions of Right Act 1860 (UK).

⁶¹⁷ See, for example, *Adams v Naylor* [1946] AC 543 (HL); and *Royster v Cavey* [1947] 1 KB 204 (CA).

[1266] Under the Crown Proceedings Act 1947 (UK) the Crown is vicariously liable for the torts of its servants. Absent a limb of the state with corporate personality, it does not have institutional liability for the wrongs of its servants. Direct liability for the unlawful act could not arise because the position remained that the Crown could do no wrong in private law.⁶¹⁸

[1267] The New Zealand position differed from the position in the United Kingdom from the 19th century, when we passed our own statute to mitigate the common law position. The New Zealand statute was regarded as being of wider scope in permitting tort claims for damages. There were some exceptions, but negligence claims were not excluded.⁶¹⁹ In two decisions in the 1880s the Crown was held directly liable for its negligence: in one case for failing to maintain the telegraph wire in proper order and in the other for failing to take appropriate precautions to make the cheaper coal it had purchased for its railway engines no more risky than the coal it had previously purchased.⁶²⁰

[1268] Despite the differences between the United Kingdom and New Zealand positions, the Crown Proceedings Act 1947 (UK) became the model for New Zealand's CPA.⁶²¹ This Act, like the UK one, has traditionally been viewed as permitting vicarious liability claims against the Crown for the torts of its servants but not direct liability claims.

The Crown Proceedings Act 1950

[1269] The CPA is:⁶²²

An Act to consolidate and amend the law relating to the civil liabilities and rights of the Crown and officers of the Crown, and to civil proceedings by and against the Crown.

⁶¹⁸ *Chagos Islanders v Attorney-General* [2004] EWCA Civ 997 at [22].

⁶¹⁹ Crown Suits Act 1881, later replaced by the Crown Suits Amendment Act 1910.

⁶²⁰ *Williams v The Queen* (1882) 1 NZLR (CA) 222; and *Dawson v The Queen* Southland Times 2 March 1993. These cases are discussed in Anderson at 12-13.

⁶²¹ Anderson at 18 considers this was a deliberate decision, to change what had been previously accepted in the New Zealand courts (that the Crown could be directly liable for its institutional negligence).

⁶²² Long Title to Crown Proceedings Act 1950.

[1270] The Act, however, consolidates and amends the law in a rather complicated way with wording that is not altogether clear.

[1271] Section 3 is about the Crown enforcing its rights, or citizens enforcing their rights against the Crown, by way of civil proceedings. Section 3(1)(a) provides for the Crown to bring proceedings. Section 3(2) provides for proceedings to be brought against the Crown. This includes proceedings against the Crown in tort as follows:

3 Claims enforceable by or against the Crown under this Act

...

(2) Subject to the provisions of this Act and any other Act, any person (whether a subject of the Sovereign or not) may enforce as of right, by civil proceedings taken against the Crown for that purpose in accordance with the provisions of this Act, any claim or demand against the Crown in respect of any of the following causes of action:

...

(b) any wrong or injury for which the Crown is liable in tort under this Act or under any other Act which is binding on the Crown:

...

(e) any other cause of action in respect of which a petition of right would lie against the Crown at common law ...

[1272] As stated in the opening words of s 3(2) the right to bring proceedings under either of these limbs is subject to the provisions of the CPA and any other Act.

[1273] Section 6 is concerned with the Crown's liability in tort. It sets out what proceedings can be brought against the Crown in tort under the CPA (as referred to in s 3(2)(b)). At the time of the events giving rise to this proceeding, s 6(1)(a) of the CPA provided:

6 Liability of the Crown in tort

(1) Subject to the provisions of this Act and any other Act, the Crown shall be subject to all those liabilities in tort to which, if it were a private person of full age and capacity, it would be subject—

(a) in respect of torts committed by its servants or agents;

...

provided that no proceedings shall lie against the Crown by virtue of paragraph (a) in respect of any act or omission of a servant or agent of the Crown unless the act or omission would apart from the provisions of this Act have given rise to a cause of action in tort against that servant or agent or his or her estate.

[1274] This means the Crown is liable in tort for the actions of its servants or agents as though the Crown was a private person. That is, it has vicarious liability. There are three points to note about this:

- (a) Section 6(1) does not refer to a claim against the Crown for direct (as opposed to vicarious) liability. Traditionally this has been viewed as meaning that only vicarious liability claims can be brought, even though this was not the position in New Zealand prior to the CPA.⁶²³
- (b) Vicarious liability against the Crown arises only if the act or omission would have given rise to an action in tort against the servant or agent “apart from the provisions of this Act”.
- (c) The Crown’s vicarious liability is subject to the provisions of the CPA and any other Act.

[1275] All three aspects of the section give rise to issues in this case. Two other subsections of s 6 are also relevant and complicate matters.

[1276] Section 6(3) provides:

- (3) Where any functions are conferred or imposed upon an officer of the Crown as such either by any rule of the common law or by statute, and that officer commits a tort while performing or purporting to perform those functions, the liabilities of the Crown in respect of the tort shall be such as they would have been if those functions had been conferred or imposed solely by virtue of instructions lawfully given by the Crown.

⁶²³ In *Couch (No 2)* at [173], referring to the previously cited article by Professor Anderson. See also the discussion of Cooke P in *Crispin v Registrar of the District Court* [1986] 2 NZLR 246 (CA) at 225 where his Honour said that claims in tort against the Crown can be put forward in one of three ways: against the Crown for vicarious liability; against the individual Crown servant who committed the tort; or against the holder of an office as an *eo nomine* defendant where a statute permits.

[1277] Breaking this section down, it provides:

- (a) where any functions are conferred (or imposed) on an officer of the Crown as such (either by the common law or statute);
- (b) and the officer commits a tort while performing (or purporting to perform) those functions;
- (c) the liabilities of the Crown (in respect of the tort):
 - (i) shall be such
 - (ii) as they would have been if the functions had been conferred (or imposed) solely by virtue of instructions lawfully given by the Crown.

[1278] This section therefore concerns the Crown's liability for actions of its officers. And it imposes that vicarious liability as though the officers whose functions had been conferred or imposed had acted pursuant to lawful instructions from the Crown. This provision overruled the effect of the common law rule that acts or omissions of an officer (as opposed to a servant) did not confer any right of action by a member of the public against the Crown.⁶²⁴ The "solely by virtue of instructions lawfully given by the Crown" responded to the common law rationale for the rule that officers were acting under statute, as opposed to instruction from the Executive. The section therefore established that the Crown's vicarious liability applied to the actions of its servants, agents and its officers.

[1279] Section 6(4) of the CPA is also relevant. At the time of the events giving rise to this proceeding s 6(4) of the CPA provided:

6 Liability of the Crown in tort

⁶²⁴ In support of this point, the defendant refers to *Tobin v R* (1864) 143 ER 1148, cited in R M Bell *Crown Proceedings being a Full Statement of Law relating to Actions By and Against the Crown as affected by the Crown Proceedings Act, 1947* (Sweet & Maxwell, London, 1948) at 33 (under the heading "Functions Deriving from a Rule of Law") and in A E Currie *Crown and Subject* (Legal Publications, Wellington, 1953) at 8-9 (under the heading "Section 4 – Officers of the Crown").

...

- (4) Any enactment which negatives or limits the amount of the liability of any government department or officer of the Crown in respect of any tort committed by that department or officer shall, in the case of proceedings against the Crown under this section in respect of a tort committed by that department or officer, apply in relation to the Crown as it would have applied in relation to that department or officer if the proceedings against the Crown had been proceedings against that department or officer.

[1280] Breaking that section down, it provides:

- (a) Any enactment which:
 - (i) negatives; or
 - (ii) limits the amount of

the liability of:
 - (iii) any government department; or
 - (iv) officer of the Crown,
- (b) shall, in the case of proceedings against the Crown under this section in respect of a tort committed by that department or officer,
 - (i) apply in relation to the Crown
 - (ii) as it would have applied in relation to that department or officer if the proceedings against the Crown had been proceedings against that department or officer.

[1281] The effect of this section is at issue.

[1282] There are further provisions potentially relevant to the issues. There are definitions that apply unless the context otherwise requires in s 2(1). These definitions include:

officer, in relation to the Crown, includes any servant of the Sovereign, and accordingly (but without prejudice to the generality of the foregoing provision) includes a Minister of the Crown; and a member of the New Zealand armed forces; but does not include the Governor-General, or any Judge, District Court Judge, Justice of the Peace, Community Magistrate, or other judicial officer.

servant, in relation to the Crown, means any servant of the Sovereign, and accordingly (but without prejudice to the generality of the foregoing provision) includes a Minister of the Crown; and a member of the New Zealand armed forces; but does not include the Governor-General, or any Judge, District Court Judge, Justice of the Peace, Community Magistrate, or other judicial officer.

[1283] Section 14(2) provides:

14 Method of making Crown a party to proceedings

...

- (2) Subject to the provisions of this Act and any other Act, civil proceedings under this Act against the Crown shall be instituted against—
- (a) the appropriate government department in its own name if the department may be sued apart from this section; or
 - (b) the appropriate officer of the Crown in the name in which he or she may be sued on behalf of the Crown or of any government department if the officer may be sued on behalf of the Crown or of any government department apart from this section; or
 - (d) the Attorney-General if there is no such appropriate department or officer of if the person instituting the proceedings has any reasonable doubt whether any and if so, which department or officer is appropriate; or
 - (d) any 2 or more of them jointly.

[1284] This section is therefore about who civil proceedings against the Crown are to be brought against. The correct named defendant in the proceedings depends on whether a government department (s 14(2)(a)) or an officer of the Crown on behalf of a government department or the Crown (s 14(2)(b)) can be sued apart from this section. This reflects the position that in some proceedings it is a government department or a named officer (on behalf of a government department or the Crown) that can be sued. Where that is not the case, the Attorney-General is named.

[1285] Section 29 provides:

29 Application to the Crown of certain statutory provisions

- (1) This Act shall not prejudice the right of the Crown to take advantage of the provisions of an Act although not named therein; and it is hereby declared that in any civil proceedings against the Crown the provisions of any Act which could, if the proceedings were between subjects, be relied upon by the defendant as a defence to the proceedings, whether in whole or in part, or otherwise, may, subject to any express provision to the contrary, be so relied upon by the Crown.

[1286] Breaking that down, s 29 provides:

- (a) An Act shall not prejudice the right of the Crown to take advantage of the provisions of an Act although not named therein; and
- (b) It is declared that:
- (i) in any civil proceedings against the Crown, the provisions of any Act –
 - (ii) which could, if the proceedings were between subjects, be relied upon by the defendant as a defence to the proceedings, whether in whole or in part, otherwise –
 - (iii) may, subject to any express provision to the contrary, be so relied upon by the Crown.

[1287] In other words, in all civil proceedings, the Crown can rely on defences in an Act that would be available if the proceedings were between subjects.

Couch

a) *Background*

[1288] The effect of s 6 CPA has been considered by the Supreme Court. The context was a claim for negligence brought by Ms Couch against the Crown, for the Department of Corrections, for negligent supervision of a parolee, Mr Bell, who had been convicted of aggravated robbery. While on parole, Mr Bell was allowed to take

up employment with the local RSA despite this being unsuitable employment because he would be working around alcohol and large quantities of cash. He murdered three RSA staff members and seriously injured Ms Couch.

[1289] The claim came before the Supreme Court in two stages. In *Couch (No 1)* the Supreme Court was considering the Crown's application to strike out the claim. The Court was unanimous that the claim should not be struck out on the question of whether a duty of care was owed.⁶²⁵ At this time the pleading was unclear but the allegations appeared to involve:

- (a) a claim against the Crown (Attorney-General on behalf of the Department of Corrections (Probation Service)) directly for institutional negligence;⁶²⁶ and
- (b) a claim against the Crown for vicarious liability for the probation officer's negligence in supervising Mr Bell.⁶²⁷

[1290] There were no submissions on whether either basis for the claim would be possible given s 6 of the CPA.⁶²⁸ The hearing was adjourned to enable submissions to be made on whether exemplary damages were available.⁶²⁹ This was considered in *Couch (No 2)* where the Supreme Court also considered the Crown's vicarious liability when its servants had a statutory protection from personal liability.⁶³⁰ The Supreme Court also touched on the Crown's direct liability.

⁶²⁵ *Couch (No 1)*. The Supreme Court held it was arguable a duty of care was owed and this needed to be determined at trial on the evidence rather than being struck out at an interlocutory stage.

⁶²⁶ For the under-resourced situation in which the relevant branch operated and the lack of training that the probation officer, who was inexperienced and overworked, supervising Mr Bell had received (at [12]-[13]).

⁶²⁷ It was alleged the officer had not kept appointments with Mr Bell, Mr Bell was not required to report at all for significant periods of time, he had not attended programs to address his alcohol problem, he was placed at the RSA where there was alcohol and cash despite having previously committed an aggravated burglary and that he was considered a high risk of reoffending, particularly if he did not address his alcohol problem, and no warning was given to the RSA about this background (at [23]).

⁶²⁸ This is discussed in Anderson at 1-4. Anderson's article was written after *Couch (No 1)* and before *Couch (No 2)*. It was his view that even if the problem of s 86 of the State Sector Act could be overcome, the CPA says "as clearly as it is possible to say that the Crown is liable for a tort only if one of its servants is also liable. Unlike everyone else, the Crown is immune from institutional liability."

⁶²⁹ The issue arose because the negligence claim was for damages for personal injury and compensatory damages were barred by the Accident Compensation Act 2001, s 317.

⁶³⁰ *Couch (No 2)*.

b) Vicarious liability

[1291] One of the grounds on which the Crown argued the claim for exemplary damages should be struck out was a combination of s 86 of the State Sector Act 1988 and s 6(1) of the CPA. The Crown submitted it could not be vicariously liable, because its servants were not independently liable as they had protection from liability under s 86.

[1292] The State Sector Act was part of reforms in the 1980s, which included a new model of public service management. This new model placed emphasis on upward accountability to ministers rather than on accountability directly to the users of public services.⁶³¹ At the time of *Couch (No 2)* (and at the time giving rise to this proceeding) s 86 of the State Sector Act provided:

86 Protection from liability

No chief executive, or employee, shall be personally liable for any liability of the Department, or for any act done or omitted by the Department or by the chief executive or any employee of the Department or of the chief executive in good faith in pursuance or intended pursuance of the functions or powers of the Department or of the chief executive.

[1293] The contention for the Crown in *Couch (No 2)* was that s 86 of the State Sector Act conferred an immunity on Department of Corrections employees and this meant the Crown was also immune pursuant to s 6(1) of the CPA. If the Crown's contention was correct, the Crown would never have liability for the actions of public servants provided they had acted in good faith in pursuance of their intended functions or powers.

[1294] The Supreme Court was unanimous that the combination of s 6 of the CPA and s 86 of the State Sector Act did not provide the Crown immunity for the claim brought by Ms Couch. As the Chief Justice put it, s 86 could not have been intended to provide such a "sweeping immunity" to the Crown under s 6 of the CPA.⁶³² Such a "sweeping immunity" would be inconsistent with the purpose of s 6(1) of the CPA, which was to

⁶³¹ Law Commission *The Crown in Court: A review of the CPA and national security information in proceedings* (NZLC, R135, 2015) [*The Crown in Court*] at 3.81. See also *Couch (No 2)* at [184]-[193] per McGrath J.

⁶³² *Couch (No 2)* at [7] per Elias CJ.

make the Crown liable for torts committed by its servants or agents in the same way as any other person of full age and capacity.⁶³³ It would also be inconsistent with s 27(3) of the NZBORA which provides:⁶³⁴

27 Right to justice

...

- (3) Every person has the right to bring civil proceedings against, and to defend civil proceedings brought by, the Crown, and to have those proceedings heard, according to law, in the same way as civil proceedings between individuals.

[1295] The problem facing the Court was that s 6(1) of the CPA provided that the Crown's liability for the actions of its servants or agents arose only if, apart from the CPA, its servants would have been liable. Because of s 86 of the State Sector Act, its servants were not liable. There was also the issue of whether s 86 was an enactment of the kind referred to in s 6(4) of the CPA, and therefore whether the Crown had the benefit of s 86 because of this. A literal reading of these provisions seemed to conflict with what the Judges were clear was not intended by s 86.

[1296] The majority judgment on this point was given by Tipping J (with whom Elias CJ and Blanchard J agreed). His solution was to interpret s 86 as conferring a narrow indemnity: that is, an indemnity for internal responsibilities only. It meant that a department could not recover from its chief executive or employee, even if their conduct rendered the department liable, provided they had acted in good faith. It did not provide an immunity for government employees from primary tortious liability to a plaintiff. This meant the Crown's vicarious liability was not excluded by the proviso to s 6(1)(a).⁶³⁵ Tipping J considered this interpretation was reinforced by s 6(4) of the CPA. He considered it was difficult to reconcile that section with the minority's view of the scope of s 6(1).⁶³⁶

[1297] McGrath J delivered the principal minority judgment. In contrast with the majority, his solution was not to read down s 86. He gave full effect to the ordinary

⁶³³ At [7] per Elias CJ; at [71] per Blanchard J; at [173] per Tipping J; at [187] per McGrath J; and Wilson J at [251].

⁶³⁴ At [7] per Elias CJ; at [71] per Blanchard J; at [173] per Tipping J; at [187] per McGrath J.

⁶³⁵ At [7] per Elias CJ; at [71] per Blanchard J; at [173]-[174] per Tipping J.

⁶³⁶ At [177].

meaning of s 86. He considered this meaning was consistent with the policy of immunity for Crown servants.⁶³⁷ On this view s 86 excluded personal liability of chief executives and Crown servants for all negligent acts committed in good faith.⁶³⁸ This, however, did not mean the Crown was also immune from liability. Crown immunity arising from s 86 of the State Sector Act would constitute “such a major change to the liability of the Crown in tort” which could not have been the purpose of s 86.⁶³⁹ It would also be inconsistent with s 27(3) of the NZBORA. That section was intended to place the Crown in the same position in relation to litigation as private individuals.⁶⁴⁰

[1298] How then to reconcile s 86 with s 6(1) of the CPA? McGrath J’s solution was to interpret s 6(1) in light of its purpose. He referred to the approach that had been taken in Canada to similar provisions. There it had been held that the equivalent to s 6(1) entitled the Crown to rely on defences that would be available if the proceedings were “between persons” and not to defences available only to employees of the Crown generally.⁶⁴¹ Similarly, he considered s 27(3) of the NZBORA and s 6(1) of the CPA required the Crown to be placed in the same position as a private employer. A private employer does not have Crown status nor the power or ability to rely on defences that are conferred only on employees who are Crown servants.⁶⁴²

⁶³⁷ In *Couch (No 2)* at [192], McGrath J referred to Peter Hogg and Patrick Monahan *Liability of the Crown* (3rd ed, Carswell, Toronto, 2000) at 191 where the authors say: “Many commentators take the view that some degree of immunity from tortious liability should be conferred by statute upon individual Crown servants. It is argued that a damages award against a Crown servant is an unpredictable and usually disproportionately severe penalty to impose on a person who has acted in good faith in the intended execution of his or her duties. It is also argued that the risk of personal liability could lead to overly cautious (risk-averse) behaviour on the part of Crown servants whose jobs call for vigorous action but who are fearful of being sued.

⁶³⁸ At [193].

⁶³⁹ At [187]. McGrath J considered that the purpose of s 6(1) of the CPA was to make the Crown liable for the torts committed by its servants or agents in the same way as any other person of full age and capacity subject to the expressed exceptions. One of those exceptions was the proviso in s 6(1)(a) that the Crown was not liable unless the claimant could point to a Crown servant who would be liable independent of the Act. A literal reading of s 6(1) would mean the Crown was not liable under s 6(1) because s 86 had removed the tortious character of the actions of public servants carried out in good faith.

⁶⁴⁰ At [187]. In support of this view, McGrath J referred to the White Paper on the Bill of Rights (Geoffrey Palmer “A Bill of Rights for New Zealand: a White Paper” [1984-1985] 1 AJHR A6 at [10.176]) which stated: “[t]o give constitutional status to the core principle recognised in the Crown Proceedings Act 1950: that the individual should be able to bring legal proceedings against the Government, and more generally to engage in civil litigation with it, without the Government enjoying any procedural or jurisdictional privileges. This is central to the rule of law.”

⁶⁴¹ *Couch (No 2)* at [188] per McGrath J.

⁶⁴² At [188].

[1299] McGrath J considered the proviso to s 6(1), taking a contextual interpretation, meant that it excluded Crown liability only when the defence could be relied on by the Crown servant or agent as a private person (that is, as though the proceedings were “between persons”). It did not exclude Crown liability where the servant was immunised on account of being a public servant, as was the case under s 86.⁶⁴³ This contextual interpretation was consistent with s 27(3) of the NZBORA because it did not affect Crown liability.⁶⁴⁴

[1300] McGrath J considered this approach was not inconsistent with s 6(4). He regarded this provision as of limited scope. Its purpose and effect was no more than:⁶⁴⁵

... to treat proceedings against the Crown as though the proceedings were against the responsible government department or officer of the Crown. Just as a government department cannot rely on an employee’s immunity under s 86 to escape tortious liability, neither can the Crown escape tortious liability by relying on s 86.

[1301] In other words, s 6(4) was not about conferring an immunity on the Crown from vicarious liability for the acts of its public servants if they had a statutory immunity from personal liability. McGrath J did not elaborate further on the operation of s 6(4).

[1302] Wilson J gave a brief separate judgment. On the issue of the Crown’s vicarious liability he said:

It appears to me however that, in order to reconcile s 86 and s 6, it is necessary either to read s 86 as leaving employees who act in good faith liable to be sued, but not liable to the Crown, or to read s 6(4) as not applying to s 86. Neither interpretation appears to me to accord with the plain meaning of the relevant words. My view, like that of McGrath J, is that the conflict between the sections should be resolved by giving full effect to the words of s 86, with the consequence that public servants acting in good faith do not incur any personal liability but the Crown is liable for their acts or omissions. To leave those employees exposed to being sued seems to me to be not only contrary to the words of s 86 but also to be an outcome which Parliament would not have intended in enacting that section against the background of s 6.

⁶⁴³ At [188]-[189].

⁶⁴⁴ At [191].

⁶⁴⁵ At footnote 272 of *Couch (No 2)* per McGrath J.

[1303] It can be seen that the Judge regarded the real conflict to be between s 6(4) of the CPA and s 86 of the State Sector Act (rather than s 6(1) of the CPA and s 86 of the State Sector Act, which had been the focus of the Crown’s submissions in that case and the majority’s reasoning). Like McGrath J, Wilson J did not favour the majority’s approach because it deprived Crown employees of the protection Parliament had intended them to have under s 86. The Crown should be vicariously liable for the actions of Crown employees despite the personal protection from liability they enjoyed. He considered s 6(4) needed to be read down as not applying to s 86.

c) Direct liability

[1304] In *Couch (No 1)* there was little consideration given to the CPA. It was, however, mentioned in the judgment of Elias CJ. The Chief Justice regarded s 6 of the CPA and s 27(3) of the NZBORA as supporting a duty of care on the part of the Probation Service in its supervision of parolees. She considered the approach of the majority in the Court of Appeal, which had found against a duty of care, as effectively immunising the Probation Service from negligence actions no matter how foreseeable the risk. She considered this “[did] not sit well” with s 6 of the CPA or s 27(3) of the NZBORA.⁶⁴⁶

[1305] It is not apparent that the Court intended these comments to be limited to vicarious liability for the actions of the probation officer. The Judges did not discuss that only vicarious liability could arise under s 6, nor the interpretative route by which direct liability might still exist. However the general tenor of the comments is that liability for Crown negligence is the starting point under s 27(3) of the NZBORA.

[1306] In *Couch (No 2)* two of the Judges touched on whether there could be direct liability against the Crown. Of the proviso to s 6(1) Tipping J commented “[t]his, it has been said, suggests that the Crown can be liable vicariously but not by attribution”, but noted the Court was not called upon to decide this.⁶⁴⁷

[1307] Blanchard J said:⁶⁴⁸

⁶⁴⁶ *Couch (No 1)* at [36] per Elias CJ (with whom Anderson J agreed).

⁶⁴⁷ *Couch (No 2)* at [173] and footnote 264.

⁶⁴⁸ *Couch (No 2)* at [71] per Blanchard J.

... At [173] of his reasons Tipping J touches upon the question of whether the Crown can be liable for negligence directly through attribution as well as vicariously. The law on that topic, which we are not called upon to consider on this appeal, is uncertain. Statutory reform is overdue, as Professor Anderson says in his paper to which Tipping J refers. I would not want it to be thought, however, that I am presently persuaded that a direct claim is necessarily precluded by the Crown Proceedings Act 1950, when read against a background of prior statutory history unique to this jurisdiction.

[1308] Again the general tenor of these comments is that there ought to be direct liability against the Crown if, on common law principles, a duty of care is owed.⁶⁴⁹

Amendments to s 86 of the State Sector Act and s 6 of the CPA

[1309] Section 86 of the State Sector Act was amended following *Couch (No 2)*. It now provides:

86 Immunity for Public Service chief executives and employees

- (1) Public Service chief executives and employees are immune from liability in civil proceedings for good-faith actions or omissions in pursuance or intended pursuance of their duties, functions, or powers.
- (2) *See also* section 6 of the Crown Proceedings Act 1950.

[1310] Section 6 of the CPA was also amended as follows (the amendments are indicated in italics):⁶⁵⁰

6 Liability of the Crown in tort

- (1) Subject to the provisions of this Act and any other Act, *and except as provided in subsection (4A) ...*, the Crown shall be subject to all those liabilities in tort to which, if it were a private person of full age and capacity, it would be subject—
 - (a) in respect of torts committed by its servants or agents;

...

provided that no proceedings shall lie against the Crown by virtue of paragraph (a) in respect of any act or omission of a servant or agent of the Crown unless the act or omission would apart from the

⁶⁴⁹ Law Commission *The Crown in Court* at [3.35] observes that in Canada, which has similar provisions, the limitation on direct liability against the Crown in tort appears to be largely ignored.

⁶⁵⁰ This amendment occurred in two stages. The reference to subsection (4A) was added on 18 July 2013 when that subsection was added. Later, on 1 March 2016, they were also made subject to a new subsection (4B), providing a comparable provision relating to an immunity to specified persons under s 351 of the Food Act 2014.

provisions of this Act have given rise to a cause of action in tort against that servant or agent or his or her estate.

...

- (4) *Except as provided in subsection (4A) ..., any enactment which negatives or limits the amount of the liability of any government department or officer of the Crown in respect of any tort committed by that department or officer shall, in the case of proceedings against the Crown under this section in respect of a tort committed by that department or officer, apply in relation to the Crown as it would have applied in relation to that department or officer if the proceedings against the Crown had been proceedings against that department or officer.*
- (4A) *Despite certain Crown servants being immune from liability under section 86 of the State Sector Act 1988,—*
- (a) *a court may find the Crown itself liable in tort in respect of the actions or omissions of those servants; and*
- (ab) *in relation to delegates performing functions or exercising powers of the chief executive under the Children, Young Persons, and Their Families Act 1989, a court may find the Crown liable in tort for the actions or omissions of those delegates; and*
- (b) *for the purpose of determining whether the Crown is so liable, the court must disregard the immunity in section 86.*

[1311] These amendments were aimed at restoring what many had thought was the law prior to *Couch (No 2)*.⁶⁵¹ The Explanatory Note, introducing these amendments, stated the amendments were made because *Couch (No 2)* had interpreted s 86 differently from Parliament's intent.⁶⁵² In other words, the view of McGrath and Wilson JJ as to the effect of s 86, was Parliament's intention and that had been the prevailing view prior to *Couch (No 2)*. The amendments (restoring Parliament's intention and the earlier prevailing view) meant that public servants covered by the State Sector Act were protected from civil liability to third parties.

[1312] An issue in this case is whether I am bound by the majority view in *Couch (No 2)* as to the meaning of ss 6(1) and (4) (the defendant's submission) or whether Parliament has overruled that view and it is McGrath J's view that prevails (the plaintiffs' submission).

⁶⁵¹ Law Commission *The Crown in Court* at [3.57].

⁶⁵² State Sector and Public Finance Reform Bill 2013 (55-1), Explanatory Note at 15.

[1313] Against this background I now consider s 163 of the Biosecurity Act and what effect that has on the Crown's liability in this case.

Section 163 of the Biosecurity Act 1993

The section

[1314] Section 163 provides:

163 Protection of inspectors and others

An inspector, authorised person, accredited person, or other person who does any act or omits to do any act in pursuance of any of the functions, powers, or duties conferred on that person by or under this Act or a pest management plan or a pathway management plan shall not be under any civil or criminal liability in respect of that act or omission, unless the person has acted, or omitted to act, in bad faith or without reasonable cause.

[1315] Breaking the section down into its parts, it applies to:

- (a) an inspector, authorised person, accredited person, or other person;
- (b) who does any act, or omits to do any act,
- (c) in pursuance of any of the functions, powers, or duties
- (d) conferred on that person by or under:
 - (i) this Act;
 - (ii) a pest management plan; or
 - (iii) or a pathway management plan.

[1316] It provides protection to such a person:

- (a) from criminal or civil liability
- (b) for both acts or omissions

- (c) unless the person was acting or omitting to act:
 - (i) in bad faith; or
 - (ii) without reasonable cause.

Issues

[1317] Two issues of interpretation arise. The first is what is meant by “conferred ... by or under this Act”.⁶⁵³ If this does not apply to the actions and omissions of MAF personnel at issue in this case then the question of whether the Crown can have the benefit of s 163, through the CPA, does not arise.

[1318] If, however, s 163 does apply to the actions and omissions of MAF personnel at issue in this case, the second issue is whether those actions or omissions were “without reasonable cause”. In that case, MAF personnel would not have the benefit of this provision and, again, no issue would arise under the CPA as to whether the Crown also has the benefit of the provision under the CPA.

[1319] There is no relevant judicial consideration of this provision.

Conferred by or under this Act

[1320] The Minister is responsible for administering the Act and has particular responsibilities.⁶⁵⁴ The work of Ministry employees on IHSs, permits and clearing goods flows from those responsibilities.

[1321] The defendant submits:

The work of administering the BSA is undertaken both by: (a) those appointed to identified roles (e.g. inspectors), whose powers or duties are conferred directly and acts (or omissions) are formally done (or not); and (b) by those Ministry employees assisting and advising those in identified roles (including the Minister and the Director-General), in relation to such acts or omissions, whose powers and duties are conferred indirectly under the Act. There is no

⁶⁵³ This issue had not been discussed in the parties’ closing submissions. It was one of the issues on which I sought further submissions.

⁶⁵⁴ Biosecurity Act, s 8.

logical or policy or factual basis for asserting a legislative intent in s 163 to cover only category (a) and not (b).

[1322] I accept that administering the Act is undertaken by personnel in these two broad categories. However, to understand the scope of s 163 it is necessary to review the Act in more detail.

[1323] In addition to the Minister, the Act confers particular powers, functions and duties on particular other persons: chief technical officers, deputy chief technical officers, inspectors, authorised persons and accredited persons. The Act provides for their appointment and the extent to which their functions can be delegated.⁶⁵⁵ The delegation is likely to have been made pursuant to s 41 of the State Sector Act, which permits the chief executive of a Department to delegate functions under any Act to an employee.

[1324] Relevantly, for present purposes, an import health standard (IHS) is issued by the Director-General (the chief executive of MAF) following the recommendation of a chief technical officer.⁶⁵⁶ If an IHS requires that a permit be obtained before goods can be imported, the Director-General may issue such a permit. The permits at issue in this case were delegated to an “authorising officer” pursuant to a delegation from the Director-General. The Biosecurity Act does not contain provisions for the Director-General to delegate this power.⁶⁵⁷

[1325] A chief technical officer is required to be employed under the State Sector Act.⁶⁵⁸ They are “appointed” by the chief executive of a department recognised by the responsible Minister.⁶⁵⁹ And they may exercise “all the powers and perform all the functions and duties conferred on a chief technical officer by this Act”.⁶⁶⁰ A chief technical officer can delegate their functions, powers or duties to any person, although this appears to require an instrument of delegation.⁶⁶¹

⁶⁵⁵ Sections 101-105.

⁶⁵⁶ Section 22.

⁶⁵⁷ It does contain provisions about certain powers that cannot be delegated.

⁶⁵⁸ Section 101(3).

⁶⁵⁹ Section 101(3).

⁶⁶⁰ Section 101(3).

⁶⁶¹ Section 105.

[1326] The responsibility for clearing goods at the border is conferred on “an inspector”.⁶⁶² A chief technical officer may “appoint inspectors and authorised officers” for the purposes of administering and enforcing the Act. They may also “appoint” authorised persons for the purposes of a national pest management strategy.⁶⁶³ Inspectors and authorised persons may be “authorised on their appointment to exercise all the of the powers conferred on inspectors and authorised persons under this Act, or the regulations, or only such of those powers as are specified in their instruments of appointment or subsequently by written notice”.⁶⁶⁴

[1327] A chief technical officer may also “accredit persons (to be known as accredited persons) for the purposes of performing particular functions” consequential on powers exercised by an inspector or authorised person or that may be “conferred” on or may be performed by accredited persons under regulations.⁶⁶⁵

[1328] Inspectors or authorised persons appointed by the chief technical officer may, but need not, be persons who are employed under the State Sector Act.⁶⁶⁶ Inspectors or authorised persons may employ any person or request any person to assist them in carrying out the provisions of the Biosecurity Act. Such a person has the same powers as the inspector or authorised person “while that person is under the immediate direction and control of that inspector or authorised person”.⁶⁶⁷

[1329] It can be seen that the Biosecurity Act has a carefully considered and detailed framework for conferring powers on or under the Act. It can also be seen that this framework applies to “inspectors, authorised persons, accredited persons, or other person” who may have powers, functions and duties conferred on them by a chief technical officer. I consider that s 163 of the Biosecurity Act is intended to provide protection from liability to those persons providing they did not act in bad faith and without reasonable cause. The protection applies in relation to the powers, duties and functions “conferred on that person by or under the Act”. It therefore, for example,

⁶⁶² Section 27.

⁶⁶³ Section 103.

⁶⁶⁴ Section 103(6).

⁶⁶⁵ Section 103(7).

⁶⁶⁶ Section 103(5).

⁶⁶⁷ Section 106.

applies to the powers conferred on an inspector by a chief technical officer. In that case the power is conferred “under” the Act.

[1330] MAF personnel in the Plant Imports team, PHEL or other groups or teams within MAF are not appointed under the Act and they do not have powers, duties or functions specifically conferred on them by or under the Act. For example, Ms Campbell, a member of the Plant Imports team at the relevant time, described her roles as follows:

From January 2008 I worked as the Adviser responsible for nursery stock in the Plant Imports Team. I took over this position from Chris Baring. In that position I was responsible for day-to-day management of goods imported under the relevant Import Health Standards (IHSs), such as dealing with import permits, developing and reviewing schedules to the IHS, and providing advice to Inspectors and the Chief Technical Officer (CTO) for non-compliant consignments of nursery stock at the border or in post entry quarantine. I worked closely with the Senior Adviser responsible for nursery stock, Wayne Hartley, and with other Senior Advisers such as Tamsin Hains, and also with border and Quarantine Inspectors, Risk Analysis and the Plant Health Environment Laboratory (PHEL). I reported to the Team Manager of Plant Imports Susan Cooper, then Bryan Rose.

In November 2010 I was promoted to Senior Adviser responsible for Nursery Stock, which is the role I currently hold. In that position I am responsible for the development, review, and implementation of risk management measures for biosecurity risks associated with imported nursery stock; audit and assessment of specific import pathways (e.g. ‘high-health’ horticultural nursery stock sourced from MPI-approved offshore facilities); making recommendations to the CTO (for decisions under the Biosecurity Act); additionally, I provide advice across the group for implementation of requirements under the Biosecurity Act and associated systems.

[1331] Nowhere does Ms Campbell say she was acting pursuant to functions, powers or duties conferred on her under the Biosecurity Act pursuant to a delegation made by a chief technical officer. It can be seen that the role is an advisory and administrative role to others. This is reflected in the defendant’s submissions, on whether a duty of care could arise, that negligent information gathering in formulating policy could not give rise to a duty of care. The fact that they are carrying out advisory and administrative roles, rather than acting pursuant to functions conferred on them under the Act does not make their actions ultra vires as the defendant submits. The Minister and others appointed under the Act have available to them the collective knowledge, experience and expertise of all those who serve the Crown in the Ministry for which the Minister is the head.

[1332] In my view s 163 of the Act does not apply to MAF personnel employed by the Ministry to assist the Minister and other officers to administer the Act. The ordinary meaning of “confer” is “to give, grant, or bestow (a title, degree, favour, etc.)”.⁶⁶⁸ That is consistent with the formal and detailed framework that applies to inspectors, authorised persons, accredited persons and other persons appointed by a chief technical officer. MAF personnel do not require the protection from civil or criminal liability provided by s 163. They have the more extensive protection provided by s 86 of the State Sector Act.

[1333] It therefore follows that I disagree with the defendant’s submissions that s 163 applies to all the acts or omissions at issue in this case. In my view it applies to inspectors at the border (the second cause of action). It does not apply to MAF personnel involved in the decision to issue Kiwi Pollen’s import permit (the first cause of action).

Without reasonable cause

[1334] The meaning of a legislative provision is to be derived from its text and in the light of its purpose.⁶⁶⁹ I start first with its text. It applies to an “inspector, authorised person, accredited person, or other person” in pursuance of the functions, powers and duties conferred by or under the Act. It applies to them as persons (not to MAF or the Crown).⁶⁷⁰ It confers an immunity from civil or criminal liability. It applies to acts and omissions. It is therefore of wide application. Its only limit is bad faith or acting without reasonable cause.

[1335] The defendant submits Parliament is presumed to have intended to use the actual words contained in the legislation. Parliament said “reasonable cause” not “reasonable care”. The defendant submits that if Parliament had meant reasonable care it would have used those words. The defendant says “without reasonable cause” is about the purpose of the function, power or duty undertaken. They say it is about

⁶⁶⁸ The New Shorter Oxford English Dictionary (Clarendon Press – Oxford); see also Black’s Law Dictionary (10th ed).

⁶⁶⁹ Interpretation Act 1999, s 5.

⁶⁷⁰ Section 2 provides that in the Act, unless the context otherwise requires, “person includes the Crown, a corporation sole, and a body of persons (whether corporate or unincorporate)”. The Crown accepts that in the context of s 163 “person” does not include the Crown.

why the act or omission was carried out, not how well the person carried out their function, power or duty. As the relevant MAF personnel had reasonable cause to carry out their actions, the immunity applies.

[1336] The plaintiffs submit a broad interpretation of “reasonable cause” is appropriate. Properly interpreted they say it encompasses reasonable care. They submit that, if a person who is subject to a duty of care in carrying out their functions, powers or duties, has acted without reasonable care in carrying out those functions, powers or duties, they have acted without reasonable cause. Another way of putting this is that a person exercising statutory functions can never have reasonable cause to act without reasonable care.

[1337] The defendant’s submission is, in my view, the more natural reading of the words. It also provides a broader immunity to persons acting under the Act. As long as persons acting under the Act have not acted in bad faith and have a proper reason for taking the action (or omissions) they have, they will not have liability. In contrast, the plaintiffs’ interpretation would not protect persons acting under the Act from personal liability if they had acted without reasonable care. The question is which interpretation fits with Parliament’s intention when the words are read in their context.

[1338] Section 163 is one of a number of miscellaneous provisions in Part 9 of the Act. One of those provisions is s 162A. As is discussed in more detail under “Part 3: Duty” of this judgment, this section is concerned with post-border powers under the Act that are exercised for the purpose of eradicating or managing an organism. It provides for compensation for losses from the exercise of those powers but only until a pest or pathway management plan is in place. It is not concerned with compensation for losses from powers exercised under the Act pre-border or at the border.

[1339] Because of its limited scope, there remains a vast array of powers, functions and duties exercised that may cause loss to members of the public. It therefore exposes “an inspector, authorised person, accredited person, or other person” to potential claims arising out of the powers, functions and duties they exercise.

[1340] The other provision of relevance for present purposes is s 164. It provides:

164 Liability for goods

The Crown shall not be under any civil liability in respect of any loss or damage to any goods suffered—

- (a) while those goods are in the custody of the Crown by reason of the exercise, in good faith and with reasonable care, of authority under this Act; or
- (b) as a result of or in the course of any treatment, handling, or quarantine of those goods undertaken or required in good faith and with reasonable care by an inspector or any other person acting in the exercise of authority under this Act.

[1341] This section relates only to loss or damage to goods held by the Crown or which are treated, handled or held in quarantine. It anticipates that goods may be damaged when they are legitimately held, treated or handled to protect New Zealand's environment. Provided the Crown, an inspector or any other person exercising authority under the Act has acted in good faith and "with reasonable care" there is no Crown liability.

[1342] The defendant notes the use of "reasonable care", rather than "reasonable cause", in this section. He submits this shows a legislative intention that a different standard is required for goods that are effectively in the Crown's bailment. In that scenario reasonable care is required in order to have the protection afforded by the section. In other words, reasonable care and reasonable cause must mean different things.

[1343] In my view the use of the two different expressions side-by-side reflects the different scope of the provisions. The expression "reasonable care" makes more sense when determining liability for harm for goods held in possession. The expression "reasonable cause" makes more sense when applied to wide ranging powers the exercise of which is likely to cause loss. The two different expressions suggest the different wording in the two sections was deliberate. It supports the point that the meaning between the two is different.

[1344] Further, so far as an inspector, authorised person, accredited person, or other person is concerned, s 164 relates only to actions they have taken in treating, handling,

or quarantining goods. Inspectors and authorised persons have extensive other powers which may cause loss to others. For example, they have powers to:

- (a) give reasonable directions as to the movement of an aircraft or ship, or the unloading or discharge of risk goods or the disembarkation of crew or passengers;⁶⁷¹
- (b) open bags, containers and the like, containing imported goods to determine whether they are risk goods;⁶⁷²
- (c) give reasonable directions to any person disembarking an aircraft or ship and requiring those persons to make their baggage available for inspection;⁶⁷³
- (d) search and detain people;⁶⁷⁴
- (e) apply for warrants to inspect houses, maraes or buildings where there are reasonable grounds for believing any pest, unwanted organism, unauthorised goods or risk goods are present;⁶⁷⁵
- (f) do anything necessary or expedient to eradicate or manage or prevent the spread of a pest or unwanted organism after lawfully entering a place pursuant to the Act;⁶⁷⁶
- (g) seize unauthorised goods.⁶⁷⁷

[1345] Together, ss 162A and 164 leave a range of functions, powers or duties under the Act that may cause a person loss. Section 163 applies to those functions, powers, or duties. The defendant submits the “without reasonable cause” test makes sense when applied to the kind of powers exercised by inspectors and authorised persons.

⁶⁷¹ Sections 19(2) and 31.

⁶⁷² Section 30A.

⁶⁷³ Section 34(1) and (5).

⁶⁷⁴ Sections 107 and 108.

⁶⁷⁵ Section 110.

⁶⁷⁶ Section 114.

⁶⁷⁷ Section 116.

Those powers are extensive. They are likely to cause loss when exercised. Parliament has decided persons exercising those powers, for the purposes of the Act, should be protected from civil liability provided they acted in good faith and have acted with a proper purpose. That is, it is about why the power was exercised and not how it was exercised.

[1346] I agree. In my view whether a function, power or duty is exercised with reasonable cause depends on the reason for the exercise of that function, power or duty. It is not about the level of care undertaken when carrying out the function, power or duty. Reasonable care is about how the function, power or duty is exercised once the reason for exercising that function, power or duty is engaged. Parliament has determined a wide immunity should be given, dependent only on the reason for the exercise of the power, duty or function.

[1347] This interpretation fits less well with the advisory and administrative functions carried out by MAF personnel under the Act. For example MAF personnel might conduct a risk analysis for the purposes of advising on whether a recommendation should be made to put in place an IHS. How would such a task be carried out “without reasonable cause”? This reinforces my view that s 163 does not apply to other MAF personnel (discussed above).

[1348] Further those personnel do not need the protection conferred by s 163. They may carry out that task negligently (without reasonable care), but they are protected from civil liability by the immunity provided by s 86 of the State Sector Act. That immunity applies to all “good-faith” acts or omissions. There is no need for them to have the more limited protection from civil liability under s 163 of the Biosecurity Act. Parliament has already decided personal civil liability is not appropriate for those employees.

[1349] However inspectors and authorised persons are not required to be State Sector Act employees.⁶⁷⁸ Nor, it appears, are accredited persons or other persons who may be employed or requested to assist an inspector or authorised persons. Inspectors, authorised persons and accredited persons cannot be appointed to their positions

⁶⁷⁸ Section 103(5).

unless the chief technical officer is satisfied as to their experience, technical competence and qualifications.⁶⁷⁹ Further, their functions, powers and duties are specified in their appointments and so, potentially, can be specific. And, inspectors, authorised persons and accredited persons must use their best endeavours to give effect to any relevant performance or technical standards.⁶⁸⁰

[1350] Inspectors and authorised persons must comply with the lawful directions or instructions of a relevant chief technical officer.⁶⁸¹ A chief technical officer must be employed under the State Sector Act and so will have the benefit of the s 86 protection from civil liability for actions taken in good faith.⁶⁸²

[1351] This suggests the main purpose of s 163 is to ensure that inspectors, authorised person, accredited person, or other person acting under the Act, who may not be State Sector employees, are protected from personal liability provided they act in good faith and with reasonable cause. They carry out their wide ranging functions, powers and duties, which are likely to interfere with the property rights of members of the public, and they do so for the public good. They should be able to do so without fear of personal liability.

[1352] In reaching my view about the scope of s 163 I have not been persuaded that the other limited examples provided by the plaintiffs where “reasonable cause” and “reasonable care” have been used interchangeably assist. I note the plaintiffs’ submission that there is no discernible pattern in the use of “reasonable cause” and “reasonable care” in other legislative immunity provisions. I also note the defendant’s response that the theme of “in bad faith or without reasonable cause” protection from civil liability in other statutory contexts is that, when exercising statutory powers, they must be exercised for proper purposes. I consider it is appropriate to keep the focus on s 163 in the context of the Biosecurity Act.

[1353] I conclude that “without reasonable cause” in s 163 was deliberately chosen because it was intended to apply to wide ranging powers, exercised in the public good

⁶⁷⁹ Section 103(4) and (7).

⁶⁸⁰ Section 103(8).

⁶⁸¹ Section 104(1).

⁶⁸² Section 101(2A).

for the purposes of the Act, and likely to cause loss. It was intended to provide a broad immunity for those who are exercising functions, powers, or duties specifically conferred on that person by the Act, pest management plan or pathway management plan and who may not have the protection under s 86 of the State Sector Act. It was about ensuring the powers are exercised on proper grounds, not about requiring that actions are carried out with reasonable care. The Act has other mechanisms intended to ensure inspectors, authorised persons, accredited persons and other persons act competently.

[1354] Lastly, I am not persuaded that s 27 of the NZBORA requires that “without reasonable cause” be read as “without reasonable care”. On its terms s 163 applies to inspectors, authorised persons, accredited persons, or other persons and not to the Crown. If there is a choice to be made between reading down s 163 (which enables these persons to carry out their functions, powers or duties without fear of personal liability) and reading down the CPA (which potentially protects the Crown), in order to be consistent with s 27 of the NZBORA, then I agree with McGrath and Wilson JJ in *Couch (No 2)* that it is the CPA which must bend.

The Crown’s vicarious liability in this case

The State Sector Act

[1355] The State Sector Act applies to the acts and omissions of MAF personnel in this case.

[1356] At the time of these events, s 86 of the State Sector Act and s 6(4) of the CPA were in the form considered by the Supreme Court in *Couch (No 2)* and s 6(4A) had not been enacted. However, given the subsequent enacting of s 6(4A), the provision in force at the time should be given the meaning favoured by McGrath and Wilson JJ. With respect to the majority, I agree with the plaintiffs’ submission that these amendments have effectively overruled the majority’s interpretation of s 86 because they had incorrectly interpreted Parliament’s intention or should be treated as though they have.⁶⁸³

⁶⁸³ While the parties did not provide submissions on the issue of whether subsequent amendments to an Act may be an aid to interpreting the purpose of Parliament in relation to the provision in force

[1357] This means that MAF personnel do not have personal liability for their acts or omissions provided they acted “in good faith in pursuance or intended pursuance of the functions or powers of the [Ministry] or of the chief executive”. The actions or omissions of MAF personnel under the first cause of action were in pursuance of the functions or powers of the chief executive (or his delegate) to issue import permits. There is no suggestion of bad faith. The delegate who issued the permits also has immunity under s 86 because they are covered by the State Sector Act.

[1358] The protection MAF personnel have under s 86 of the State Sector Act does not protect the Crown from vicarious liability under the first cause of action. That is now plain from the amendments to s 6 of the CPA following *Couch (No 2)*. This means the Crown has vicarious liability for the negligent acts or omissions of the MAF personnel established under the first cause of action.

The Biosecurity Act

[1359] The next question is whether the Crown is vicariously liable for the actions of personnel who have the protection of s 163 of the Biosecurity Act.

[1360] As a preliminary point I note that it is unclear if Mr Hodges, the inspector whose conduct is at issue under the second cause of action, is an employee under the State Sector Act. It does, however, appear that he may have been (and may still be). He is described in his brief of evidence as working for MAF as a Quarantine Inspector. He remains employed at MAF (now MPI) but in a different capacity. Additionally, the plaintiffs raised with the Crown prior to trial whether it was necessary for individual employees of MAF to be named in the claim. The Crown’s response was that current and former staff of MAF/MPI have immunity under statute for actions

at the time, I note the decision in *Databank Systems Ltd v Commissioner of Inland Revenue* [1990] 3 NZLR 385 (PC) at 393-394; *Postal Workers Union of Aotearoa Inc v New Zealand Post Ltd* [2013] 1 NZLR 66 at [22] per Randerson J; and the discussion of JF Burrows and RI Carter in *Statute Law in New Zealand* (5th ed, online looseleaf ed, LexisNexis) at [20(c)(iii)]. While it is generally established that statutory amendments subsequent to the period at issue may not be taken into account in interpreting the relevant statutory provision they can form an aid to interpreting the purpose of the provision in force at the time in the exceptional situation that Parliament expressed that the amended provision should have retrospective effect or that it is enacted to resolve an ambiguity. In this case Parliament has expressed its desire to reverse the position of the majority and give effect to McGrath J’s view in *Couch (No 2)* in respect of the ambiguity of s 6 of the CPA at the relevant time. This is indicated by the Explanatory Note to the amending Bill, Parliamentary history materials and the overall effect of the amendment on the operation of s 6.

taken in good faith pursuant to their employment. The Crown indicated it would seek to strike out any claims in which individuals were joined as parties.

[1361] If Mr Hodges was an employee under the State Sector Act he does not need to rely on s 163. So, somewhat oddly, if the defendant's submission about the CPA is correct, that Act may confer on the Crown protection from vicarious liability for the actions of Mr Hodges through a provision on which Mr Hodges does not need to rely.

[1362] As a second preliminary point I note that I have concluded that the plaintiffs have not established liability under the second cause of action. This means it is not necessary for me to decide whether s 163 protects the Crown from vicarious liability.⁶⁸⁴ It is tempting to leave the matter there not least because the provisions of the CPA are extremely confusing and difficult to reconcile with s 27(3) of the NZBORA. A new Act to replace the CPA was recommended by the Law Commission but not acted upon. Nevertheless I consider I should at least set out the arguments and the difficulties and my view on them in case my judgment is not the end of the matter.

[1363] The question is whether s 6, properly interpreted in light of *Couch (No 2)* and s 27(3) of the NZBORA, excludes the Crown's vicarious liability because personnel acting on its behalf are protected from liability under s 163 of the Act. In considering that point, I note the views in *Couch (No 2)* that:

- (a) the CPA was intended to provide for Crown liability for the torts committed by its servants or agents in the same way as any other person of full age and capacity;
- (b) section 27(3) of the NZBORA has a similar purpose; and
- (c) the CPA should be given an interpretation consistent with s 27(3) of the NZBORA.

⁶⁸⁴ I note there may have been an issue about whether, in the circumstances of this case, the duty of care in relation to the clearance of the goods was owed by MAF or its personnel at head office in the imports team, rather than Mr Hodges. This issue was not discussed.

[1364] The majority interpretation of s 6 of the CPA and s 86 of the State Sector Act in *Couch (No 2)* reconciled these provisions by reading down s 86. This meant there was no Act that protected the servant of the Crown in that case and no difficulty in finding the Crown had liability under s 6(1). McGrath and Wilson JJ had to grapple with how to interpret s 6 in light of s 27 of the NZBORA because they considered that full effect had to be given to s 86.

[1365] The same issue arises here. If an inspector has protection from s 163 of the Biosecurity Act, why does that confer protection on the Crown from vicarious liability for the inspector's actions when s 27 of the NZBORA provides that "every person has the right to bring civil proceedings against ... the Crown ... and to have those proceedings heard ... in the same way as civil proceedings between individuals."

[1366] Therefore, had it been necessary to determine the issue in this case, it seems to me it would be appropriate to rely on the minority interpretation of s 6(1)(a) and s 6(4), as that interpretation had to take into account s 27 whereas the majority reasoning did not. In other words, s 6 should be interpreted consistently with s 27 of the NZBORA. On this view, McGrath J explained:

- (a) Section 6(1)(a) excludes Crown liability only when the defence could be relied on by a MAF servant or agent as a private person (that is, not because of their position as a public servant). A MAF servant or agent would not have a defence under s 163 of the Biosecurity Act if they were private persons; and
- (b) Section 6(4) is of limited effect. It is intended to do no more than treat proceedings against the Crown as though they were against the responsible government department or officer. Just as MAF or the responsible officer of the Crown cannot escape tortious liability by relying on their employee's immunity, neither can the Crown.

[1367] There are two principal counter arguments to this view. The first is that, as the defendant submits, Parliament added ss 6(4A) and 6(4B) to clarify that the Crown was

vicariously liable despite s 86 of the State Sector Act.⁶⁸⁵ When it did so, it otherwise left s 6(4) intact.⁶⁸⁶ It can be argued that Parliament intended only to ensure that s 86 did not preclude Crown vicarious liability, but otherwise intended the Crown to have the benefit of any statutory protection conferred on its officers or employees.

[1368] This is a strong argument. It may, however, be reading too much into the amendment to s 6 introducing s 6(4A). It assumes a comprehensive consideration of the circumstances in which the Crown should have vicarious liability, rather than amendments aimed simply at restoring what had been intended by s 86. Moreover, it does not grapple with whether it is consistent with s 27 of the NZBORA to permit the Crown the benefit of s 163 of the Act, when that Act on its terms does not apply to the Crown.

[1369] The second argument is that McGrath J's interpretation of s 6 was necessary because of the sweeping immunity that would be conferred on the Crown through "the side wind" of s 86. That is, s 86 was of general application, intended only to remove personal liability for public servants acting in good faith. It was not intended, by a side wind, to affect the Crown's vicarious liability under the CPA for the acts and omissions of public servants. That would have deprived the CPA of much of its effect as it applied to Crown liability for the torts of its servants. That same rationale does not apply to specific statutory protections conferred on particular persons acting under particular Acts.

[1370] Again this is a strong argument. However it can also be said that Parliament enacted s 163 of the Biosecurity Act against the backdrop of s 27 of the NZBORA. When it did so it specifically conferred an immunity on the Crown for civil liability in some circumstances (s 164) but not in others (s 163).

[1371] On balance, had it been necessary to decide this issue I would have favoured McGrath J's interpretation of ss 6(1) and 6(4). What that means for s 6(1) is relatively straightforward. The Crown could not rely on s 163 because, if this were a claim

⁶⁸⁵ Section 6(4B) is irrelevant in this proceeding.

⁶⁸⁶ In its December 2015 review of the CPA, the Law Commission noted that s 6(4A) does not apply to other immunities given elsewhere in the statute book to Crown employees: Law Commission *The Crown in Court* at [3.10].

between persons, the Crown's servant or agent would not have the benefit of s 163. What it means for s 6(4) is less clear.

[1372] Section 6(4) was not discussed in any detail in *Couch (No 2)*. The Crown's argument in that case was based on s 6(1). The discussion by the Judges on s 6(4) was raised more as a point about whether it did or did not support their respective views on s 6(1). It is therefore not entirely clear to me how McGrath J considered s 6(4) would operate in a case like the present. One feature of s 6(4) is that it concerns an enactment that negatives or limits the liability of "any government department or officer of the Crown" whereas s 6(1) refers to "servant or agents".⁶⁸⁷ The starting point must be that the different wording between these provisions must have been intentional.

[1373] The defendant submits that because "officer" in s 6(4) is defined as including "servant of the Sovereign", it applies to all servants of the Crown. In other words, there is no difference as to whom ss 6(1) and 6(4) apply, other than that s 6(1) applies to agents who may not be servants. That submission does not, however, address why s 6(1) refers to servants whereas s 6(4) refers to officers. Section 2(1) defines "officers" as including a servant of the Crown whereas "servant" is defined as meaning any servant. These definitions apply unless the context requires otherwise. In my view s 6(4) must have been intended to refer to something different from all servants, given the reference to servants in s 6(1). Section 6(1) applies to all servants including officers (as s 6(3) confirms). Section 6(4) refers to officers in a narrower sense.

[1374] The plaintiffs submit the answer to what s 6(4) means, and what is implicit in McGrath J's note on s 6(4), is s 14. In other words, the point of s 6(4) is to cover the different ways in which the Crown can be sued. The plaintiffs submit the appropriate officer in s 6(4) is the person who it is appropriate to sue under s 14. As proceedings could not be brought against an inspector in this case (or the other persons named in s 163) under s 14, s 6(4) does not protect the Crown. That does appear to explain McGrath J's view on s 6(4), although the section is worded very difficultly. On balance, that is the view I would have taken had this required determination.

⁶⁸⁷ These were also matters on which I sought further submissions.

[1375] For completeness, it does not seem to me that s 6(3) assists the defendant's position. It is a provision that ensures the Crown can have vicarious liability for its officers. Further, I consider s 29 supports McGrath J's interpretation of s 6(1). It confirms that in civil proceedings (including torts) the Crown obtains the benefit of statutory provisions that would be available to a defendant if the proceeding was between persons. As the defendant noted it means, for example, the Crown has the benefit of the statutory defences of truth (s 8) and honest opinion (s 9) under the Defamation Act 1992. In other words, s 6(1) provides that the Crown has vicarious liability in the same way as applies between private persons and s 29 confirms the Crown may rely on statutory defences available to private persons.

The Crown's direct liability

[1376] The submissions for the parties also addressed whether the Crown has direct liability for MAF's systemic or collective negligence. As I apprehend it, this was very much a back-up submission for the plaintiffs. The submissions were somewhat light and the subject is a difficult one. The suggestion that there might be direct liability against the Crown was raised in *Couch (No 2)* but not addressed. Had it been necessary to decide this issue it is likely I would have needed further submissions on the point. In these circumstances I consider it appropriate not to venture any views on the matter.

Schedule of experts

[1377] The plaintiffs and the defendant called a number of expert witnesses to give evidence on diverse specialist areas including genetics, bacteriology, plant biology, evolutionary biology, epidemiology, statistics and economics. This evidence was primarily relevant to “Part 6: Causation” of this judgment. There were also a number of witnesses with specialist expertise who gave evidence because of their involvement in the facts relevant to each cause of action (e.g. Dr Gerard Clover).

[1378] The schedule below sets out, in alphabetical order, the qualifications and experience of witnesses who gave expert evidence in these proceedings:

Name	Qualification	Experience	H-index/Citation ⁶⁸⁸
Georgio Balestra	Masters in Biological Sciences from University of Tuscia, Italy (1990).	Plant Pathologist and Phyto-bacteriologist who has been focussing on scientific research into kiwifruit bacterial diseases worldwide since the mid-1980s. Associate Professor in the Department of Agriculture and Forestry Sciences at the University of Tuscia. Involved with this university since 1984.	Post-2010: 17 (WOS) and 14 (GS). Pre-2010 citation count: 77 (WOS) and 192 (GS). Post-2010 citation count: 728 (WOS) and 825 (GS).
Samuel Beckett	PhD in Veterinary Science from Massey University.	Research focus on analytical epidemiology and risk analysis particularly within veterinary context. Involved in biosecurity sphere in Australia and United States. He worked for Biosecurity Australia and the US Department of Agriculture Centre for Epidemiology and Animal Health.	Post-2010 H-index: 2 (WOS). Pre-2010 citation count: 66 (WOS). Post-2010 citation count: 24 (WOS).
David Bryant	PhD in Mathematics from the	PhD thesis on theory and methodology of the evolutionary analysis of genetic data.	

⁶⁸⁸ Professor Newcomb provided details of the publications of each of the experts. This set out the H index of each author. This is an author-level metric that attempts to measure both the productivity and citation impact of the publications of a scientist, based on the scientist’s most cited papers and the number of citations they received in other publications. A good H index will be greater than the number of years the researcher has been practising as a scientist. Professor Newcomb also set out the citation count of each author. This is the citation count of each article calculated using data from Web of Science (“WOS”) and Google Scholar (“GS”) for each author.

Name	Qualification	Experience	H-index/Citation ⁶⁸⁸
	University of Canterbury.	<p>20 years post-doctoral experience working on mathematical, statistical and computational aspects of evolutionary biology.</p> <p>Current Professor of Mathematics at the University of Otago.</p>	
Fraser Colegrave	Honours degree in Economics from the University of Auckland (1996).	<p>Managing Director of Insight Economics Ltd, an economic consultancy based in Auckland. Prior to this, a founding director of another consultancy for 12 years (Covec Ltd).</p> <p>20 years commercial experience as an economic consultant. Gave expert evidence on the importance of border protection to New Zealand and specific importance to kiwifruit industry. Provided cost benefit analysis on incursion prevention and incursion response.</p> <p>Produced dynamic maps showing spread of Psa3 in Bay of Plenty region based on data from Rob Taylor and KVH.</p>	
James Curran	PhD in Statistics from the University of Auckland.	<p>Professor of Statistics at the University of Auckland with particular expertise in the field of statistical analysis and interpretation of forensic trace evidence and forensic genetics. Has held tenured academic positions since 1999. Current President of the New Zealand Forensic Society.</p> <p>Forensic human genetics is more concerned with DNA evidence for the purposes of criminal investigation and litigation rather than phylogenetics or evolutionary genetics in a plant pathogenic context. However, he has particular experience in statistical analysis for the purpose of assessing the weight of evidence.</p> <p>The data used by Professor Curran was partly put together by Dr Mik Black (a colleague from the University of Otago).</p>	
Kerry Everett	PhD in Plant Virology from Massey University (1994).	<p>An applied plant pathologist specialising in mycology, bacteriology and virology with 35 years of scientific research experience. Currently a Senior Scientist at Plant & Food Research.</p> <p>Her research expertise is in plant pathology and sustainable crop production systems for a range of fruit crops such as avocado, kiwifruit, pip fruit and citrus. She has specialist experience in pathogen detection and identification, pathogen ecology, epidemiology, biological control and pre- and post-harvest technologies for pathogen management and market access.</p>	
Edward Holmes	PhD in Zoology from University of Cambridge (1990).	Professor of Biology and Medicine, University of Sydney, Australia.	Post-2010 H index: 98 (WOS) and 77 (GS).

Name	Qualification	Experience	H-index/Citation ⁶⁸⁸
		<p>30 years of scientific research experience in the fields of evolutionary biology, microbiology and virology, with a specific expertise in phylogenetics (the science of determining the evolutionary relationships between organisms, including bacteria).</p> <p>Distinguished scientist (having published 486 peer-reviewed papers published in some of the world's leading scientific journals, which have been cited more than 45,000 times), he is the author of two books on aspects of evolutionary biology, one of which is a textbook on phylogenetics, he has served on many editorial boards including <i>Molecular Biology & Evolution</i>, which is arguably the highest impact journal on evolutionary biology</p>	<p>Citation count pre-2010: 16,823 (WOS) and 18,041 (GS).</p> <p>Post-2010 citation count: 23,537 (WOS) and 26,140 (GS).</p>
Angelo Mazzaglia	PhD in Plant Pathology from University of Tuscia, Italy (1999).	<p>Researcher at the Department for Agriculture and Forestry Sciences at the University of Tuscia.</p> <p>Has developed research speciality in kiwifruit diseases since 2008 (following Italian outbreak of Psa). His general expertise is in plant pathogenic fungi, bacterial communities associated with extreme environments and bacterial plant pathogens.</p>	<p>Post-2010 H index: 9 (WOS).</p> <p>Pre-2010 citation count: 51 (WOS).</p> <p>Post-2010 citation count: 247 (WOS).</p>
Honour McCann	PhD in Plant Pathology from University of Toronto (2013).	<p>PhD thesis on evolution of host specificity and virulence of Psa.</p> <p>Post-doctoral researcher at Massey University.</p> <p>Leads an international collaborative research programme to identify the origins of the latest global pandemic of Psa3 and the evolutionary history of Psa.</p>	<p>H index: 4 (post-2010) (WOS).</p> <p>Citation count: 51 (pre-2010) and 175 (post-2010) (WOS).</p>
Richard Newcomb	PhD in Biochemistry and Molecular Biology from Australian National University (1996).	<p>Chief Scientist at Plant & Food Research and Professor of Evolutionary Genetics at the University of Auckland.</p> <p>Over 20 years experience in scientific research across a range of scientific fields including genetics, molecular biology and evolution.</p>	

Name	Qualification	Experience	H-index/Citation ⁶⁸⁸
		Provided general background evidence on the scientific method.	
Françoise Petter	Master of Engineering in Agronomy (Plant Protection) from École Nationale Supérieure d'Agronomie de Nancy (1984)	<p>Current Assistant Director of the European Plant Protection Organisation (since 2003). In charge of coordinating and implementing Diagnostic and Pest Risk Analysis Programmes and assistance to the Director-General on general matters. Chair of EPPO panels on Phytosanitary Measures, Pest Risk Analysis and Diagnostics Panel (including the panel on Bacteriology).</p> <p>More than 20 years experience in pest risk analysis, government biosecurity policy and international relations regarding pest management and other relevant areas.</p> <p>Prior to her role at the EPPO, Ms Petter worked at the French Ministry of Agriculture (1986-2002) in both operational and policy roles.</p>	
Russell Poulter	PhD in Genetics from Leicester University.	<p>Associate Professor in the Department of Biochemistry at the University of Otago. Has held tenured academic position since 1972.</p> <p>Research focusses on microbial genetics, the inheritance of particular genes or sets of genes in bacteria and fungi and comparative genetics. Major focus on the genetic analysis of Psa since mid-2011.</p>	<p>Post-2010 H index: 2 (WOS).</p> <p>Citation count: 0 pre-2010) and 37 (post-2010) (WOS).</p>
Gretchen Stanton	Master of Science in Agricultural Economics from the University of Arizona (1977).	<p>Retired agricultural economist with over 30 years' experience working for the World Trade Organisation and its precursor with most of this focussing on international trade rules relating to animal and plant health.</p> <p>Chair of the negotiations on what became the WTO SPS Agreement (1989-1995). Head of the Agriculture Division at the WTO from 1995-2016. Responsible for all aspects of WTO work related to the implementation of the SPS Agreement.</p>	
Joel Vanneste	PhD in Plant Pathology from the University of Paris.	<p>Also holds the equivalent of a Master of Advanced Studies in Phytopathology from the University of Paris.</p> <p>Over 25 years' experience in the field and particularly on Psa and the bacterial causal agent of fire blight.</p> <p>Currently a Senior Scientist at Plant & Food Research and had been there since 2003 in a variety of</p>	<p>Post-2010 H-index: 11 (WOS) and 19 (GS).</p> <p>Pre-2010 citation count: 104 (WOS) and 993 (GS);</p> <p>Post-2010 citation count: 391 (WOS) and 1592 (GS).</p>

Name	Qualification	Experience	H-index/Citation ⁶⁸⁸
		scientist, group leader and research roles.	

[1379] While indicators such as H-indices and citation counts may provide some helpful background in considering the expertise of witnesses, in my view it would be wrong to prefer one expert over another based simply on these scores. For example, while the Card *et al* (2007) paper’s citation count increased significantly following the outbreak of disease in New Zealand (and overseas) and the subsequent focus on the pollen pathway, MAF’s reliance on this paper for the purposes of setting import requirements is criticised and constitutes a major issue under the first cause of action brought by the plaintiffs in this proceeding.⁶⁸⁹ It understandably has a high citation count given its relevance following the Psa outbreak in New Zealand from late-2010 onwards. Moreover, many of the witnesses, such as Dr Beckett, undertake work in private practice and these scores do not necessarily reflect the nature of their work.

[1380] I consider that all the experts were properly qualified. I found their evidence helpful. I assessed their evidence in light of its scope, its basis and its logical strength, and in the context of all the evidence before me.

⁶⁸⁹ Card *et al* (2007) has a pre-2010 citation count of 3 (WOS) and 8 (GS); post-2010 citation count of 30 (WOS) and 36 (GS).