
A Review of Import Requirements and Border Processes in Light of the Entry of Psa into New Zealand

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29 June 2012

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Executive summary

The incursion of *Pseudomonas syringae* *pv.* *actinidiae* (Psa) has had a devastating impact on the New Zealand kiwifruit industry and the effect will be felt by many orchardists and the regional Bay of Plenty economy for years to come. The estimates of damage are still emerging but initial indications are that the direct cost to the kiwifruit industry may be up to \$410m over the next five years, without factoring in the wider consequential impacts. At the level of the individual orchardist, considerable wealth has been lost and the pathway back to a profitable enterprise is uncertain.

The entry of Psa may have been attributable to inadequate import requirements for risk goods, a failure by border security to adequately implement those import requirements, the illegal importation of plant material, or as a result of people moving between Psa-infected areas and New Zealand kiwifruit orchards. The work to identify the most likely pathway will continue but it may never be possible to identify how Psa entered the country.

The import requirements set by the Ministry of Agriculture and Forestry (MAF), now Ministry for Primary Industries (MPI), came under close scrutiny following the outbreak of Psa and an independent review was requested to examine the import requirements and border processes in place prior to the outbreak. This review has examined whether the import requirements and border processes were appropriate for five risk goods: kiwifruit pollen, kiwifruit nursery stock (budwood and tissue culture), kiwifruit seeds, kiwifruit, and horticultural equipment.

Incursions will happen and we need to learn from this incursion

As a country heavily reliant on agricultural/horticultural trade, New Zealand must accept there will always be a degree of risk associated with imports of organic material and that biosecurity incursions will occur from time to time.

With respect to the entry of Psa into New Zealand there were several areas where the kiwifruit industry was exposed to higher than necessary levels of risk. Although there are concerns about whether the import requirements and border processes adequately managed the risks associated with Psa, it is important to note that it does not necessary follow that these shortfalls contributed to the entry of Psa into New Zealand. An assessment of the likely means by which Psa entered New Zealand is beyond the scope of this paper.

Major shortcomings were identified with the import requirements and border processes

We conclude there were major shortcomings with the relevant import requirements and border processes in place prior to the entry of Psa into New Zealand.

The following are the main shortcomings that we have identified through this review:

1. The import requirements for kiwifruit pollen were inadequate. The conditions of import were based on a scientific review that was unnecessarily definitive in discounting the possibility of pollen as a vector for bacterial pathogens. Regardless of the veracity of the science on whether pollen could transmit Psa, MAF staff also failed to recognise that plant contaminants (a recognised source of Psa) would

inevitably accompany the consignments. MAF's response to a finding that live Psa could be detected on pollen from infected orchards was sub-standard and meant MAF missed an opportunity to initiate procedures to track the consignments of pollen that had already entered the country.

2. The process used to develop the kiwifruit pollen import requirements was deficient. A formal risk analysis for pollen imports should have been carried out. Although not legally required to do so, MAF should also have consulted industry prior to allowing the first consignment of pollen to enter the country. The resulting lack of industry awareness may have compounded the consequences of having inadequate import conditions in place for pollen by preventing industry from raising any possible concerns they may have had about exposure to this pathway.
3. The import requirements for nursery stock placed too much reliance on being able to detect any plants infected with Psa within the minimum six months that they were required to be kept in quarantine. Given the economic consequences of any failing in this system, MAF should have at least considered prohibiting imports of nursery stock from Psa-infected areas. The testing regime used in quarantine was ultimately considered unreliable for detecting Psa in symptomless plants. MAF's response upon learning of the unreliability of the testing regime was not sufficiently proactive, with no-one identifying the need to track-down those plants that had previously been given clearance.
4. There are specific areas of concern with how the import requirements were implemented at the border. A consignment of 'anthers' was incorrectly allowed into the country under the terms of a pollen import permit; consignments of gold kiwifruit were incorrectly allowed into the country in the absence of an Import Health Standard; and a consignment of nursery stock was released from quarantine without being tested for Psa.

The shortcomings were primarily due to a systems failure rather than any one decision point

The shortcomings identified in this report are not due to irrational or unreasonable decisions being made by individual MAF staff. Rather, they are primarily due to the lack of a strategic view of the risk to the kiwifruit industry, a failure to adequately respond to changing circumstances, and the absence of effective working relationships between MAF, industry stakeholders and scientific researchers.

There is joint responsibility for the failure to adequately identify the threat of Psa

While MAF should accept responsibility for the areas of concern identified above, a key finding is that the 'biosecurity system' as a whole did not adequately respond to the risks posed by Psa. There was a lack of connectedness between MAF and key stakeholders and a lack of concern and urgency from the kiwifruit industry about whether all biosecurity settings were appropriate in light of the very real threat posed by Psa.

MAF had an opportunity to revisit the appropriateness of its import requirements when a virulent strain of Psa emerged in Italy. By 2009/10 there had been an observable and marked change in the risk profile of Psa: unlike its traditional spread, Psa was having a severe

effect on kiwifruit orchards in Italy, was primarily affecting gold kiwifruit for the first time, and was spreading rapidly throughout Italy. In line with their internal guidelines, it is our view that MAF should have undertaken a formal pest risk assessment of Psa.

If undertaken, this pest risk assessment would likely have included examining all possible pathways for the pest; considering the economic consequences of Psa entering New Zealand; revisiting the appropriateness of existing import requirements; and tailoring border processes accordingly. It is pertinent that in May 2010, Australia reacted to the Italian Psa outbreak by initiating a first-principles assessment of the risks posed Psa and by requiring all pollen imports to be tested for Psa.

Zespri, in light of its first-hand knowledge of the impact Psa was having on Italian orchards, must accept some responsibility for not actively examining existing import requirements. It appears Zespri made a number of optimistic assumptions about the protection afforded by New Zealand's biosecurity regime. Agricultural and horticultural sectors in New Zealand derive immense value from remaining pest-free so should be investing their own resources into maintaining this status – particularly by monitoring emerging risks. Assessing emerging risks is a complex task at the best of times and when industry groups are not identifying an urgent need to revisit all relevant import requirements it increases the likelihood that the risk will not be viewed as a priority.

The reaction to the emerging threat of Psa was therefore fragmented and much delayed

The task of identifying and managing the risks posed by Psa was left to those MAF staff with responsibility for overseeing the import requirements for each of the specific risk goods. This led to a reactive and fragmented assessment of the risks of Psa across individual pathways: for example, the risks associated with kiwifruit imports were very well managed by MAF, whereas the risks associated with pollen imports were never reassessed. The MAF committee specifically established in 2008 to identify new and emerging biosecurity risks never discussed the emergence of a virulent strain of Psa offshore; while the MAF Risk Analysis Team responsible for monitoring offshore developments was unaware in 2010 that pollen imports were even taking place.

The evidence also demonstrates a lack of basic information sharing between staff at MAF and Plant & Food Research. By mid-2010 MAF and Plant & Food Research staff had sufficient information between them to raise serious concerns about the adequacy of import requirements for managing the risks of Psa; yet this information was never collated. In particular, staff at Plant & Food were unaware that commercial pollen imports might be taking place, so never informed MAF of research they had undertaken in Italy that showed that live Psa could be detected on kiwifruit pollen from infected orchards.

Our recommendations are at the systems level

Many of the issues identified by this paper are situation-specific, such as the granting of border clearance to goods that were not allowed into New Zealand. However, other shortcomings are reflective of systematic issues with how MAF collected and analysed information and engaged with stakeholders. The following recommendations are intended to address these broader concerns; our belief is that the MAF processes of the time were administratively efficient but operated in absence of an operational risk management strategy.

The recommendations arising from this review include:

1. MPI needs to look at the relative costs/benefits of **reprioritising its resources** towards managing the risks for economically significant industries.

The consequences of not adequately managing a known risk or not responding appropriately to an emerging risk are heightened for New Zealand's key agricultural and horticultural sectors. There may well be net benefits in re-prioritising MPI's resources away from smaller, less strategic industries in order to ensure the risks to higher-value sectors are appropriately managed. While this may well be a controversial development, it may prove to be a more appropriate means of making the best use of MPI's limited resources.

2. MPI needs to renew efforts to **centralise the identification and management of emerging risks**, which at present is largely left to the individuals with responsibility for managing particular import pathways.

It is apparent that the horizontal environment scanning undertaken by MAF's Emerging Risk and Opportunities Committee and by the Risk Analysis Team did not elevate consideration of the risks posed by a virulent strain of Psa. MPI needs to revisit the extent to which these activities are appropriately resourced and connected with the teams responsible for managing individual pathways.

MPI should consider allocating key domestic industries to senior staff members and tasking them with responsibility for ensuring the risks to that sector are being appropriately managed across all possible pathways. So instead of the risks to the kiwifruit industry having to be identified and individually managed by those responsible for imports of nursery stock, pollen, fresh fruit imports, seeds-for-sowing, and horticultural equipment, there would be a single point of contact and responsibility for ensuring a systems-wide approach to identifying and acting on emerging risk for the kiwifruit industry.

3. MPI needs to **improve the transparency** of when organic matter is being imported into New Zealand for the first time.

Prior to the import of any new organic matter MAF should consult stakeholders on the proposed import requirements; or if the import requirements have previously been specified in an existing Import Health Standard, MAF should issue a notification when the first permit has been issued for a particular type of good.

4. MPI should take specific steps to ensure that the **border processes in place for imports of risk goods remain robust**.

Risk goods should only be released from quarantine once the inspection/testing/treatment regime contained within the most recently published Import Health Standard is carried out. The list of regulated pests and testing methods contained within that standard should always supersede any entry conditions that may originally have been in place when the risk goods entered the country.

There are indications that border staff have been unable to detect the difference between closely related risk goods (with 'anthers' assumed to be pollen and gold kiwifruit assumed to be green kiwifruit). While responsibility must also lie with the

importers, MPI needs to ensure there is sufficient rigour applied to making sure imported goods are assessed against the relevant Import Health Standard and that border staff have access to appropriate resources and expertise to allow for effective verification of the goods to take place.

5. MPI needs to **improve its connectedness** with industry and research organisations.

MPI staff responsible for setting import requirements need a level of awareness of what external research projects are being undertaken that might have implications for New Zealand's biosecurity settings. In the first instance there would be value in regular information exchanges between the MPI Risk Analysis Team and Plant & Food Research to identify all research that is being undertaken and is in the pipeline that may have implications for import requirements. Establishing a more constructive relationship between the two organisations would also assist Plant & Food Research to recognise MPI's priorities and areas where further research would be valuable.

The successful identification of emerging risks is assisted by having effective working relationships with key industry contacts. Both MPI and industry groups need to reflect on whether more can be done to ensure that those staff that are making decisions about the risk profile of an industry are fully informed of the views of the industry on pests of concern.

6. MPI should **consider establishing a research fund** that can be used to commission any targeted research needed to better understand a specific area of biosecurity uncertainty.

This review highlighted MPI's dependence on timely access to research being undertaken by external organisations – in this case it was undertaken by Plant & Food Research, but one can expect that industry groups will also often take the lead in researching biosecurity risks. In the case of emerging risks, there may well be instances where MAF would benefit from prompt and targeted research to ensure its standards remain appropriate. Consideration should be given to ability of MPI to commission research to address areas of biosecurity uncertainty in cases where no other organisation has taken the lead.

Purpose and scope of report

1. The Minister for Primary Industries requested the Director-General of the Ministry of Agriculture and Forestry (MAF) to undertake an independent review of the Import Health Standards (IHS) and border clearance processes in light of the introduction of *Pseudomonas syringae* *pv.* *actinidiae* (Psa) into New Zealand.
2. This review examines the IHS and border clearance processes for the importation of five risk goods:
 - (a) kiwifruit pollen;
 - (b) kiwifruit nursery stock (budwood and tissue culture);
 - (c) kiwifruit;
 - (d) kiwifruit seeds; and
 - (e) horticultural equipment.
3. The objectives of this review are to:
 - describe the process used to develop and issue the relevant IHS;
 - establish whether the process for developing the IHS, the risk analysis and the border clearance processes adequately reflected available scientific information on the risks associated with imports of these goods;
 - establish whether the industry was consulted on the proposed import health standards;
 - set out any learning points or possible areas of improvement; and
 - set out any other reflections on development of risk analysis, import health standards that might arise from this review.
4. The Terms of Reference for this review are attached in Appendix 1.

Approach taken to this review

5. A key focus of this review is examining whether the decisions made by MAF appropriately reflected the evidence that was available at the time. Reconstructing what information was available has been done through a comprehensive review of documentation supplied by MAF and interviews with key stakeholders.
6. In addition to providing generic material about their internal procedures and policies, MAF has made available for each of the five risk goods all relevant documents pertaining to a decision to establish or amend an IHS; the content of the IHS; any risk analysis and consultation undertaken; any reviews of the import requirements; the relevant import permits; and documents relating to the clearance of consignments of these goods into New Zealand. This primary material includes emails, internal advice, consultation documents, stakeholder submissions, internal decision documents, scientific documents relied upon, peer review comments, and

material associated with imports such as Phytosanitary Certificates and shipping invoices.

7. This primary material was supplemented by interviews with 37 individuals and site-visits to Tauranga, Te Puke, and Auckland. Appendix 2 contains a list of the organisations that had staff interviewed as part of this review.

Qualifying comments about the review

8. It is beyond the scope of this review to assess the likely means by which Psa entered New Zealand. Therefore, it does not necessarily follow that any shortfalls in standards identified through this review were a contributing factor to the entry of Psa into New Zealand.
9. The conclusions of this report are based in large part on reliance on the information made available by MAF through this process. While the process for identifying relevant documents was robust, it is not possible to rule out that documents exist that were not discovered during this process.
10. An inherent problem when examining a document trail that stretches back many years is trying to determine the extent to which individuals were aware of specific issues or took steps to respond to new information. This is particularly difficult when there may be no documents to indicate that MAF took action. In several instances in this review we have exercised our judgment as to whether it was likely MAF staff were cognisant of certain issues or took certain steps - a judgment informed by the context of the relevant issue and often supported by interviews. While we stand by our assessment of the available evidence, we accept that undocumented action (including conversations between staff and verbal decisions) may have occurred that are not reflected in this report.

Structure of this report

11. Given New Zealand's reliance on agricultural/horticultural industries a very high standard of biosecurity rigor is to be expected, particularly given that any error in analysis or border security may have a serious and irreversible impact. An effective biosecurity regime for the importation of risk goods would be expected to be based around three essential elements:
 - (a) Developing **import requirements** based on the rigorous identification of possible risks, the most up-to-date scientific knowledge, consideration of the consequences if a pest was to enter the country, and engagement with stakeholders to ensure the approach is appropriate and all relevant factors have been considered.
 - (b) Having processes in place to **react appropriately when circumstances change**, including by monitoring relevant pests and changes in offshore markets, awareness of the developments in scientific knowledge regarding pests and possible means of transmission, and having clear visibility of the current risk profile of an industry.

- (c) Having **robust border processes** in place that effectively implement the import requirements, are tailored based on the latest intelligence regarding risk profiles of imports, and can react appropriately to unexpected events.
12. This report examines New Zealand's biosecurity regime against this framework, with the structure of this report broken into the following five chapters:
- (a) The following chapter provides background context, including information on Psa, detail on New Zealand's biosecurity regime and a description of how the importation of risk goods is handled by MAF.
 - (b) The report then examines the extent to which the import requirements for each of the five risk goods adequately reflected scientific knowledge of the risks of Psa to the kiwifruit industry at the time at which they were established, and whether the processes used to develop them were appropriate.
 - (c) The report then considers whether MAF reacted appropriately in light of changing circumstances in 2009/10 and the extent to which the import requirements were reviewed.
 - (d) The report then examines the extent to which the border processes in place prior to the introduction of Psa effectively implemented each of the import requirements.
 - (e) The final chapter summarises our findings and makes recommendations to MPI for the future.

Background

The arrival of Psa in New Zealand

13. MAF's report into the likely means by which Psa entered New Zealand (the Tracing Report)¹ states that significant Psa-like symptoms (heavy spotting) were observed on an orchard in Te Puke (Restricted Place Number 1 – RP1) on approximately 23 October 2010. These symptoms were reported to MAF on 5 November 2010 and the presence of Psa at RP1 was confirmed on 8 November 2010. It subsequently emerged that early Psa-like symptoms had been noticed on the neighbouring orchard, RP2, around 10 October 2010.

What is Psa?

14. Psa is a pathogenic bacterium of the Actinidia (kiwifruit) species. It can result in leaf spotting, flower wilting, cane/leader dieback and, if the degree of infection is severe enough, the death of kiwifruit vines. The bacteria can live on plant surfaces without causing a high degree of infection, but having entered the vine through a natural opening or man-made wound it will migrate to the stem, resulting in severe infection.
15. There are two strains of Psa in New Zealand: Psa-LV (less virulent) and Psa-V (virulent).² The less-virulent strain is now believed to have been present in New Zealand for many years, causing only relatively benign symptoms.³ It is Psa-V that is having a significant economic impact on the kiwifruit industry and is the cause of ongoing concern. Unless the context indicates otherwise, the term 'Psa' is used in this report to denote Psa-V.
16. Psa-LV has been present in Japan (1984), Korea (1992) and Italy (1992) for a considerable period.⁴ The more aggressive Psa-V strain was first reported in Italy (in 2007/08) and has also spread across other countries in Europe, including Spain, France, Switzerland and Portugal.⁵ Chile is also now known to have the virulent form of the disease,⁶ while there is anecdotal evidence that Psa has been present in

¹ MAF 'Psa – Pathway Tracing Report', Approved 5 December 2011
(<http://www.biosecurity.govt.nz/files/pests-and-diseases/psa-tracing-report.pdf>)

² ibid

³ MAF has indicated that Psa-LV may have been in New Zealand for as long as 8-10 years (Interview with John Gilliland and David Yard, 2 March 2012).

⁴ Everett KR (2011) 'Preliminary Literature Summary: Pseudomonas syringae pv. actinidiae and other pathovars of Pseudomonas syringae' (March 2011) and EPPO Alert List
(http://www.eppo.int/QUARANTINE/Alert_List/bacteria/P_syringae_pv_actinidiae.htm)

⁵ MAF 'Psa – Pathway Tracing Report'

⁶ The presence of Psa in Chile was confirmed in March 2011 following the detection of symptoms in late 2010
(http://www.freshplaza.com/news_detail.asp?id=78095#SlideFrame_1)

China for many years,⁷ although this has not been confirmed by Chinese government testing.

The economic impact of Psa in New Zealand

17. As at 27 June 2012, 1,226 New Zealand kiwifruit orchards had been identified as being infected with Psa-V.⁸ This means that 37% of kiwifruit orchards in New Zealand are currently infected, representing 46% of total kiwifruit hectares.
18. The economic impact of Psa has been significant, particularly with respect to Hort16A gold kiwifruit orchards. Kiwifruit Growers Inc reports that 600 hectares of gold kiwifruit have been ripped out to April 2012. The medium term future of Hort16A in New Zealand remains uncertain.
19. Projections of the total economic impact of Psa are more uncertain and require a number of assumptions to be made concerning the long-term impact on harvests, the ability to limit the spread throughout New Zealand, the uptake and success of efforts to diversify away from the affected Hort16 variety of gold kiwifruit, and the consequential effect on regional economies such as the Bay of Plenty. A recent economic impact report estimates that Psa will cost the kiwifruit industry between \$310m-\$410m in the next five years; \$500m-\$600m in the next ten years; and \$740m-\$885m over the next 15 years.⁹ The effect on regional economies and related businesses will push the total cost of Psa much higher.
20. At an individual orchardist level it is fair to say the impact for many has been devastating. The effects (particularly for gold kiwifruit orchardists) vary considerably, a range from a complete loss of income to significantly reduced orchard-gate returns from lower yields, with orchardists also facing higher cost-structures from efforts to manage the pest. The net effect is a substantial decrease in the value of kiwifruit orchards, meaning that many orchardists are now heavily indebted and will likely face difficulties servicing their debts.
21. It is relevant to note that the industry is attempting to counteract the impacts of Psa. Zespri has announced it is attempting to encourage a transfer from the vulnerable 'Hort 16A' (gold kiwifruit) to the more resilient 'Gold3' by offering access to Gold3 licences for those 'Hort 16A' grower's who choose to graft across. Once a grower has grafted across it may take up to three years for them to return to full production.¹⁰

⁷ Li Y, Cheng H, Fang S, Qian Z 2001 'Ecological factors affecting prevalence of kiwifruit bacterial canker and bacteriostatic action of bacteriocides on *Pseudomonas syringae* pv. *actinidiae*' *The Chinese Journal of Applied Ecology* 12(3): 359-62. and Li M, Tan G, Li Y, Cheng H, Han X, Xue L, Li L, 2004 'Resistance of different Chinese gooseberry cultivars to Chinese gooseberry bacterial canker caused by *Pseudomonas syringae* pv. *actinidiae* and their cluster analysis' *Plant Protection* 30(5): 51-54

⁸ Kiwifruit Vine Health, 'Psa Statistics Update' 27 June 2012, <http://www.kvh.org.nz/vdb/document/453>

⁹ Lincoln University Agribusiness and Economics Research Unit 'The Costs of Psa-V to the New Zealand Kiwifruit Industry and the Wider Community' (9 May 2012) <http://www.kvh.org.nz/vdb/document/91146>

¹⁰ Zespri Media Release 'Psa Recovery Pathway Launched' 21 March 2012

New Zealand's biosecurity regime

22. Biosecurity is a risk management system in which 'the border' is not a single point of intervention but a complex system in which risk needs to be managed at many different points. These points include offshore, en route, at the border itself, and biosecurity activities within New Zealand including transitional facilities, surveillance, incursion response and pest management.
23. This report concerns import requirements and border processes for the importation of risk goods and so focuses on the actions of MAF, the lead agency for biosecurity matters.

The role of Import Health Standards

24. Trade is a critical part of New Zealand's economy, with the country heavily reliant on the export of agricultural and horticultural produce. MAF, as the lead organisation for biosecurity policy, has to therefore strike a balance between facilitating the trade and travel essential to New Zealand's economy while protecting New Zealand from harmful pests and diseases.

The legislative framework

25. The Biosecurity Act 1993 grants MAF authority to control the importation of 'risk goods', which are defined as:¹¹
 - “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”
26. In order to manage the risks associated with the importation of such goods, MAF has the power to specify requirements that must be met before risk goods are imported, moved from a biosecurity control area or transitional facility, or given biosecurity clearance.¹² It can do this through the setting of an IHS.
27. A risk good can only be given biosecurity clearance into New Zealand if there is an IHS in place for that good and the imported good complies with all the conditions outlined in the IHS. An IHS can apply to risk goods of a certain kind or description and can apply to all countries, specified countries, countries of a particular description, or a particular location. The IHS will also specify whether the risk good requires an import permit, which may subsequently impose additional requirements.

¹¹ Section 2 of the Biosecurity Act 1993

¹² Section 22(1) of the Biosecurity Act 1993

28. Prior to issuing, amending or revoking an IHS, the Chief Technical Officer at MAF must have regard to:¹³
- (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; and
 - (d) such other matters as the chief technical officer considers relevant to the purpose of this Part”.
29. An IHS cannot be issued or amended without interested parties first being consulted, unless the Chief Technical Officer considers the matter to be urgent or minor.¹⁴ Any such consultation should be on the draft IHS or on a document that assesses the risks associated with that particular type of good.¹⁵
30. The import requirements developed by MAF must also be consistent with New Zealand’s obligations as a signatory to the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement). The SPS Agreement is founded on three basic rights and obligations:¹⁶
- (a) National sovereignty – member countries have the right to protect health, provided any restrictions on trade are consistent with the SPS Agreement.
 - (b) Necessity – any restrictions on trade must be necessary, which means based on scientific principles and justified by science-based risk analysis. In cases where “relevant scientific evidence is insufficient” a country may impose temporary restrictions while it obtains additional information.
 - (c) Non-discrimination – member countries must not use health-protection requirements to discriminate in an arbitrary way against imported goods in favour of domestically produced goods, or between goods from different countries.
31. The relevant provisions of the Biosecurity Act 1993 and the SPS are reproduced in Appendix 3. It is pertinent to note that there are also other obligations imposed in certain circumstances, including through the Hazardous Substances and New Organisms Act 1996 and Convention on Biological Diversity – the content of which are not relevant to this report.

¹³ Section 22(5) of the Biosecurity Act 1993

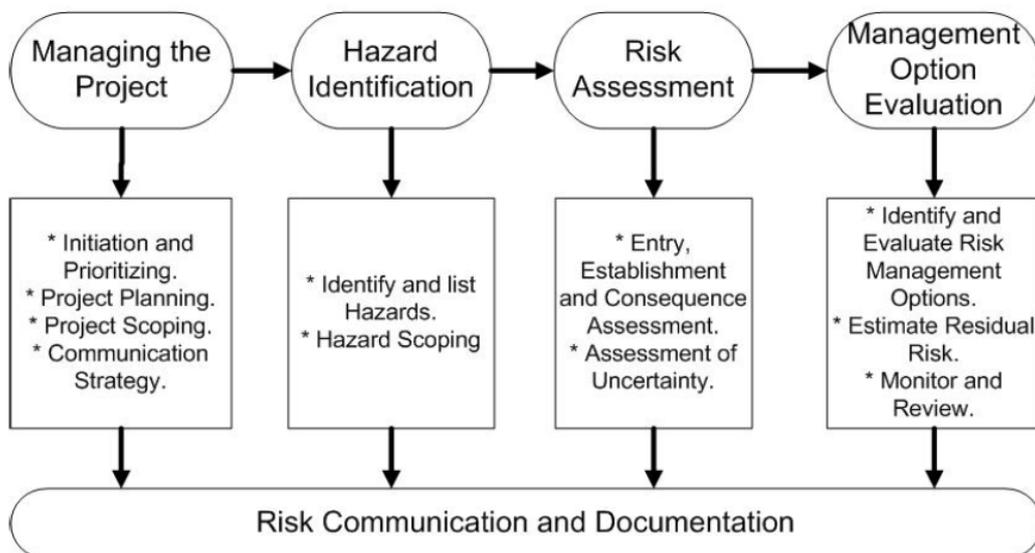
¹⁴ Section 22(6) of the Biosecurity Act 1993

¹⁵ Section 22(7) of the Biosecurity Act 1993

¹⁶ As summarised in Biosecurity New Zealand’s ‘Border Systems Manual’

Risk management through import requirements

32. To meet the requirements for issuing an IHS under the Biosecurity Act 1993, MAF is required to undertake a risk analysis for the category of good in question.¹⁷
33. The aim of undertaking a risk analysis is to enable informed decisions to be made about the whether certain goods should be permitted into New Zealand and, if so, what biosecurity measures are deemed necessary. Such an analysis requires the identification of all potential hazards associated with the good in question, an assessment of the likelihood of entry, the likelihood of exposure/establishment, the likely consequences, and an overall estimation of the risk of this occurring. Once options for risk mitigation are considered the decision makers would be in a position to assess the level of residual risk from the import of this good.
34. There will always be a degree of uncertainty and a lack of information when establishing import requirements and a judgment call will need to be made about the level of acceptable risk posed by the imports. While biosecurity policy focuses on reducing and managing risks, it is not possible to eliminate all risks with imports. Indeed, if that was the standard then trade in all organic material would halt overnight. Acceptance of a degree of manageable risk to domestic industry is the price that an agricultural/horticultural exporting country like New Zealand must pay for being able for trade in organic matter.
35. The main steps of MAF's risk analysis framework are captured below:¹⁸



36. Although a risk analysis can be undertaken to support the development or review of an IHS (for a category of goods), a risk analysis can also be undertaken to assist the

¹⁷ As per the requirement in section 22(5) of the Biosecurity Act 1993 to assess the likelihood of organisms entering the country with a risk good and the consequences of that entry.

¹⁸ Biosecurity New Zealand 'Risk Analysis Procedures' Version 1, 12 April 2006, page 11

development of surveillance programmes, prioritising established pests for management, or to support pest management strategies.¹⁹ In the case of a pest risk assessment MAF would examine whether the risks of a specific pest entering the country are appropriately managed across all possible pathways. An example of such a pest risk assessment is MAF's consideration of the risks posed by foot and mouth disease to New Zealand.²⁰

Procedures for setting Import Health Standards

37. Developing and reviewing an IHS will naturally compete with other work that MAF is required to undertake. MAF has stated that the level of information sought and analysis undertaken should be proportional to the size of the risk/opportunity identified within the available resources and the urgency required.²¹
38. MAF has developed prioritisation criteria for when to apply its limited resources. The initial identification of the need to develop or review an IHS is based on individual staff recognising a trigger event. The development of a new IHS will likely be prompted by a specific request from an importer to import a good not covered by an IHS, whereas identifying whether to review an IHS is more subjective and can be prompted by both internal and external factors. MAF has developed an internal checklist identifying 14 events that might prompt staff members to initiate a review of an IHS: including “new knowledge about a change in the risk profile of a known hazard, or newly emerging hazard”, “information received that there has been a change in the health status of the exporting country in relation to a pest or disease of biosecurity concern” and when “a project (such as that to identify top priority pests/diseases) is completed”.²²
39. A key step in developing/reviewing an IHS is for a Senior Manager or Group Manager to make an internal request for a risk analysis to be undertaken.²³ If the work is not urgent then all requests will be collated and included within MAF's annual business planning process. These requests will be assessed by the Group Manager and Team Managers (Risk Analysis), with input from other groups where appropriate. The requests are assessed from a number of perspectives:²⁴
 - technical: the suitability and probability of achieving the objective;
 - practicality: consideration of degree of urgency, logistics, resourcing, current capability, and implications for other work;
 - cost-benefit: the likely net impact in terms of a reduction of risk from the application of MAF's resources;

¹⁹ *ibid*, page 12

²⁰ See MAF 'Foot-and-Mouth Disease: An assessment of the risks facing New Zealand' (2002) <http://www.biosecurity.govt.nz/files/regs/imports/risk/foot-and-mouth-ra.pdf>

²¹ MAF 'Border Systems Manual' (2011)

²² Biosecurity New Zealand 'IHS Process: Events and Trigger Criteria Checklist', supplied on 29 March, 1:15pm

²³ Biosecurity New Zealand 'Risk Analysis Procedures' Version 1, 12 April 2006, page 12

²⁴ *ibid*, page 13

- strategic: alignment with biosecurity goals and the development and capability of growth sectors; and
 - acceptability: stakeholder interest in the work being undertaken.
40. Once a decision is made to undertake a risk analysis for a risk good then the following is the generic procedure that is observed internally:²⁵
- (a) a project team is formed that may comprise internal and external specialists;
 - (b) a pest list is developed and verified by internal specialists (or external specialists if appropriate);
 - (c) all pests categorised: any 'high impact' and/or 'low impact' pests are identified and tagged;
 - (d) a Pest Risk Assessment is conducted;
 - (e) phytosanitary measures (commensurate with the SPS Agreement) are identified to management the identified pests;
 - (f) an external technical review of the risk analysis document is undertaken by a qualified body (and the document modified if required);
 - (g) the risk analysis is approved internally and then subject to public consultation; and
 - (h) any amendments are made and the IHS is finalised.

How MAF monitors emerging risks

41. Having effective import requirements is more than just a one-off assessment of the biosecurity risks at the time the standards are established – it is about having processes in place to ensure that they reflect changing circumstances.
42. A robust biosecurity regime is not static, but has processes to identify and prioritise new pieces of information, to assess within a reasonable timeframe whether there has been a material change in the level of risk posed to an industry, and to react appropriately. The identification and assessment of emerging risks may result in no action being taken or it could prompt a systematic review of whether import requirements remain appropriate.
43. There are multiple groups within MAF with an interest in collecting and filtering information relating to emerging risks. MAF undertakes two types of activity to capture emerging risk information: active surveillance relating to pests and pathways (including by the Investigation and Diagnostic Response Directorate, and the Border Clearance Services Directorate) and passive surveillance where MAF staff monitor information relating to their area of responsibility.²⁶ Of particular relevance to this

²⁵ MAF 'Draft plants biosecurity import risks analysis procedure – checklist' (2001)

²⁶ Minute of the EROC meeting on 5 May 2009

review are the roles of the following MAF teams in monitoring and responding to new information:

- (a) The Biosecurity and Risk Assessment Group (Science and Risk Assessment Directorate): the Risk Analysis Team monitors emerging risk information from literature sources, internet sources, media monitoring, membership of specialist groups and industry contacts. The information gathered by this team may be used to evaluate the risks with a particular commodity, as the source of advice to other teams with responsibilities in this area, or as part of a formal risk analysis of a risk good.
 - (b) The Plant Imports and Exports Group (Plant, Food & Environment Directorate): this group has responsibility for the IHS and relevant import permits and so takes an active interest in monitoring whether the import requirements remain appropriate. This might be informed by examining pest notifications from exporting countries, receiving information on border detections of pests, or through relationships developed with industry stakeholders and overseas authorities. Each advisor is expected to maintain an overview of their area of responsibility.
 - (c) The Plant Health and Environment Laboratory (Investigation and Diagnostic Centres and Response Directorate): this scientific group captures information from online sources, publications from overseas biosecurity authorities, published journals, and contacts with local and overseas experts.
44. Given the huge volumes of intelligence that MAF staff will be receiving and filtering across thousands of species, pests and pathways, it is inevitable that the ability to effectively monitor emerging risks will in large part depend on human judgment. This in itself is not problematic, but one must recognise that the system of reacting to emerging risks is inherently fallible – there will always be competing priorities for staff time and in an environment of limited resources staff will often need to make judgment calls with imperfect information.
45. A lack of resources will always be a constraint on MAF's ability to recognise and respond to emerging risks. There are six advisors in MAF's Plant and Plant Products team in the Plant, Food and Environment Directorate and these individuals have responsibility for managing the import requirements for the following sectors: horticulture, arable, pastoral, consumer consumption, genetically modified seed and environment sectors. There are sixteen import standards in place across these sectors covering thousands of risk goods. MAF advises that once day-to-day issue management is undertaken (including environmental scanning, providing border and quarantine advice, managing pest interceptions, and preparing the 600+ import permits issued each year), only 20% of the team resource is free to be applied to the development or review of an IHS – approximately the same time that is required to respond to Official Information Act requests and letters to the Minister.²⁷ The high workload for this team not only has implications for their ability to accurately

²⁷ MAF, 'Management of Plant and Plant Product Imports' (May 2009)

identify emerging risks, but demonstrates the need for MAF to be selective in prioritising those emerging risks to which it should respond.

46. One important means of recognising the threat posed by an emerging risk is judging the degree of concern expressed by stakeholders and the extent to which industry sees the risk as a priority. An internal MAF paper from May 2009 highlights the need for MAF staff to have working relationship with industry stakeholders to help identify emerging biosecurity threats might give rise to concern:²⁸
- “This system relies on the professionalism and diligence of individuals to use their network of contacts to capture emerging risk information and sift out the significant data from the background ‘noise’. Most of this work is undertaken on an ad hoc basis.”
47. MAF recognised that “collected information [on emerging risks] is not routinely shared between groups or directorates”²⁹ and put in place systems to mitigate the risks that accompany the decentralised identification and assessment of new information. To promote more formalised consideration of emerging risks MAF established:
- (a) The Emerging Risks and Opportunities Committee (EROC), which was established to undertake global/national scanning to identify new and emerging biosecurity risks and opportunities and to assign those issues to the right part of the organisation for any further work.
 - (b) Informal cross-directorate groups, which were formed for sectors of interest (e.g. plants, forestry, marine etc.) to “facilitate the sharing of information across the organisation”.³⁰ Members with an interest in a sector would receive regular email updates of relevant information about that sector, with meetings to be held quarterly. The ‘plants’ group was established in early 2010 and had held an initial meeting by June 2010, albeit with “not a great turn-out”.³¹
48. EROC first met on August 2008 and subsequently met approximately every two months. It was established to provide oversight of MAF’s identification and response to emerging biological and technological risks and opportunities.³² EROC was specifically empowered to ensure “significant emerging risks...do not slip through the cracks” and to provide a filter for determining whether further attention is required for specific emerging risks.³³
49. As noted above, if an emerging risk is identified as calling into question the adequacy of existing import requirements and the matter is of sufficient priority, then MAF

²⁸ MAF, ‘Overview summary of current MAFBNZ activities relating to the capture and use of emerging risk and opportunity information’ (6 May 2009)

²⁹ *ibid*

³⁰ Minute of the EROC meeting on 3 November 2009

³¹ Minute of the EROC meeting on 8 June 2010

³² Terms of Reference for the Emerging Risks and Opportunities Management Committee

³³ *ibid*

may initiate a risk analysis for a specific risk good, a specific pathway, or for a specific pest (a pest risk assessment). This may result in an amendment of import requirements or changes to border processes to better reflect the new knowledge of risk.

The role of import permits

50. As well as specifying the conditions that must be met before a 'risk good' can be imported to New Zealand, an IHS may also require an importer to have an import permit. In such cases the importer will need to apply to MAF for a permit.
51. Import permits may provide either consignment-specific guidance to an importer on how to comply with an IHS, outline information to an inspector to aid in the clearance of a particular consignment of goods on arrival in New Zealand, or in some cases may contain all the import requirements where the IHS is silent on the conditions to be imposed.
52. Imports permits outline the specific entry requirements to be met by the importer and may include the following:
 - details of the importer and exporter;
 - commodity description and quantity;
 - requirements to be met prior to export, on arrival in New Zealand, and while in post entry quarantine; and
 - the length of time and/or the number of consignments the importer can bring into the country.

The border processes for imports of risk goods

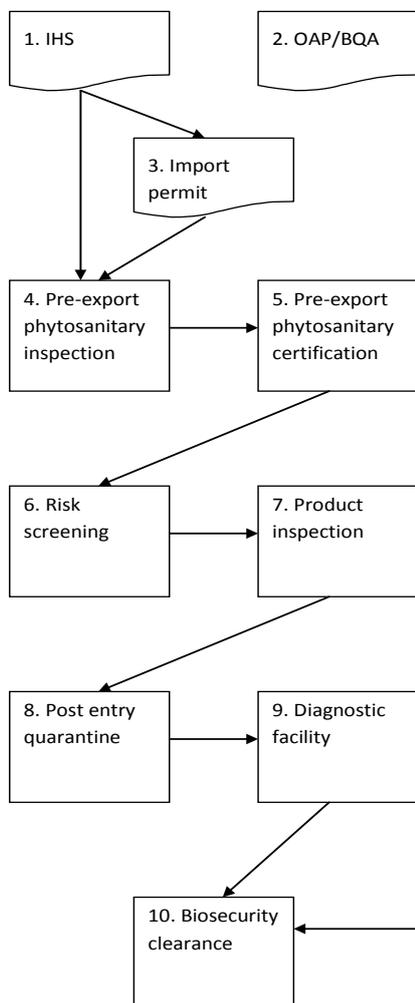
53. The legitimate import of risk goods will typically occur through three major entry pathways: international mail, cargo (unaccompanied consignments entering by sea and air), or accompanying passengers entering the country.
54. A risk good that accompanies a passenger will be identified through the customs declaration made by the passenger or by detection at the border. An unaccompanied risk good entering New Zealand may also be detected in the first instance by border staff through inspections, but in the vast majority of cases will be identified through the specific tariff code used when the consignment was shipped. If the tariff code on the imported consignment identifies the product as a 'risk good' then the consignment will automatically be stopped at the border and held pending further processing (e.g. there is a single tariff code used for all fresh produce, meaning all such imports are halted at the border as risk goods).
55. Once a risk good has been identified MAF analysts will determine whether the product in question is the subject of an IHS³⁴ and, if so, whether the importer has any necessary import permit and Phytosanitary Certificate. A Phytosanitary

³⁴ In the absence of an IHS a risk good cannot be imported into New Zealand and would need to be reshipped or destroyed.

Certificate is a document issued by the National Plant Protection Organisation (NPPO) in the exporting country that states whether specific conditions have been met prior to the goods leaving the country (e.g. whether the goods are free from visually detectable pests, whether the goods have been subject to any treatment etc). The relevant IHS or import permit will state whether the goods require a Phytosanitary Certificate prior to entering the country and what any such certificate must specify.

56. If the documentation is in order then the goods will either be cleared for release or will be subject to a physical inspection (all the products that are the subject of this report require a physical inspection for visible pests). If the inspection does not identify any pests³⁵ then the MAF inspector will give the consignment biosecurity clearance, unless it is a condition of IHS or import permit that the product in question needs to be transferred to a Post Entry Quarantine (PEQ) facility.
57. The following diagram provides a high level overview of the end-to-end import process:

³⁵ If pests are identified in the consignment then the consignment may be treated, re-shipped, or destroyed.



1. **Import health standard (IHS)**
All risk goods must be imported into New Zealand under a valid IHS
2. **Official Assurance Programme (OAP) or Bilateral Quarantine Agreement (BQA)**
An official agreement may exist with the exporting country's National Plant Protection Organisation (NPPO) that details the specific measures that will occur prior to export for high risk pests.
3. **Import permit**
Some risk goods require an import permit, which specifies the entry requirements for the product
4. **Pre-export phytosanitary inspection**
The exporting NPPO inspects the goods to ensure they meet New Zealand's entry conditions for that product.
5. **Pre-export phytosanitary certification**
If satisfied that the import requirements have been met, the exporting NPPO will issue a Phytosanitary Certificate that specifies the importer/exporter, the commodity/quantity, any treatment undertaken and any additional declarations required by the IHS or import permit.
6. **Risk screening**
The MAF Inspector will assess all documentation associated with the consignment to verify that the goods are compliant with the entry conditions. This will include ensuring there is an IHS in place; an import permit has been presented if necessary, and the Phytosanitary Certificate is in order. Some goods may be eligible for clearance at this stage without an inspection (e.g. canned food)
7. **Product inspection**
The MAF Inspector inspects the goods to verify they are free from visually detectable pests and other contamination (e.g. soil, leaf material) and verify documentation is compliant. Goods not requiring quarantine will be eligible for clearance at this stage.
8. **Post Entry Quarantine**
Specified risk goods will be held in quarantine and subject to inspections/testing/treatment as per the IHS or import permit.
9. **Diagnostic facility**
Samples of plants will be sent to a MAF approved facility for pre-determined testing, as per the IHS or import permit.
10. **Biosecurity clearance**
If appropriate, the MAF inspector will grant the risk goods biosecurity clearance.

58. It is relevant to briefly mention the Government-Industry Agreement (GIA) for Biosecurity Readiness and Response. Under this structure the government will negotiate ground-rules for joint decision-making and cost-sharing, which will enable MAF and each industry to:
- (a) decide which pests are a priority for readiness and response;
 - (b) jointly design and oversee readiness plans and management of responses; and
 - (c) agree on cost-sharing for readiness and response activities.
59. The expectation is that MAF and industry will begin working a lot more collaboratively in preparation for incursions. Inevitably the working relationships formed through this process and the critical examination of pests of concern will help inform MAF's pre-border activity and risk analysis work.

The appropriateness of import requirements prior to 2009

60. This chapter examines the substance of the import requirements and the adequacy of the processes used to develop them for the five goods that are subject to this review: nursery stock, pollen, fruit, seeds, and horticultural equipment. The focus is on the appropriateness of the import requirements during the period to 2009 in light of the risks posed by Psa.
61. From 2009 onwards there was a noticeable change in the severity of Psa in offshore markets, new scientific knowledge regarding the spread of the bacteria, and emergence of concerns about possible pathways for the pest into New Zealand. These circumstances and the extent to which MAF acted appropriately in light of this changing information are examined in the next chapter.

Psa was perceived as a low-risk pest prior to 2009

62. Interviews with MAF staff and industry stakeholders have confirmed that prior to the outbreak of the virulent form of Psa in Italy, Psa was not widely considered to be a significant threat to the New Zealand kiwifruit industry.
63. Zespri acknowledged that their overwhelming biosecurity concern prior to 2009 was preventing the entry of the fruit fly into New Zealand. MAF have stated that, “at the time [2001 – 2007] while Psa was considered to be a quarantine pest, the significance of the organism was not known.”³⁶
64. MAF’s CAT file³⁷ provides an insight into how MAF viewed Psa in 2003:³⁸
 - (a) Psa is “a significant pest as it can cause severe damage and production loss in kiwifruit”.
 - (b) Psa is listed as being present in Japan and Italy.
 - (c) Potential entry pathways are identified as tissue cultures and cuttings.
 - (d) “The pathogen may exist as a resident on the surface of mature fruit, but it is improbable that cells would survive to infect seed or seedlings”.

³⁶ Information on C2004/58742 – 120 budwood cuttings of *Actinidia chinensis*, provided to Sapere Research Group, Nursery Stock Folder 3.

³⁷ "CAT files" were the spreadsheets which summarised assessment information for import risk analysis for plant pests - for example, information about its name, whether it was in New Zealand, its predicted impact etc

³⁸ Data was entered on 14 August 2003 and peer reviewed on 15 December 2003

- (e) The potential economic consequences from damage to plants was assessed by MAF as “high impact”.
 - (f) The potential economic consequence on exports was assessed by MAF as “some impact”.
65. MAF published this assessment of Psa as part of a 2004 consultation on the Nursery Stock IHS and its conclusions were unchallenged. MAF’s consultation in 2004 was the first time that MAF had publicly recognised Psa as a possible biosecurity risk that needed to be managed through import health standards and targeted border processes.

The import requirements for nursery stock were appropriate prior to 2009

66. The import requirements that were in place for kiwifruit nursery stock up until 2009 reflected a very prudent approach by MAF to risk management. Despite no apparent concern amongst industry stakeholders regarding the threat of Psa, MAF established Psa as a regulated (and actionable) pest for nursery stock imports and required all imports to be tested for the bacteria before being released from PEQ.

The relevant Import Health Standard

67. The importation of nursery stock is very important to the kiwifruit industry in New Zealand as a means of adding new varieties that may have improved traits both for meeting consumer demand and for stock diversification. Trade in such material can be of significant commercial value meaning that a domestic industry may often push for an import regime that facilitates easy access to such material.
68. Nursery stock imported into New Zealand must meet IHS 155.02.06 *Importation of Nursery Stock*. All nursery stock must meet basic conditions set out in that document (section 2), while some species are subject to additional species-specific requirements as contained in the relevant schedule of special conditions (section 3). The Nursery Stock IHS is an overarching set of obligations that govern the import of a range of plant material, including budwood, tissue culture, and pollen. The import requirements for pollen are dealt with separately in this report.
69. For the purposes of this paper, the basic conditions to be met by nursery stock imports are not in issue, as they are largely supplanted by the specific conditions contained within the Actinidia (kiwifruit) schedule.

The 2004 amendment of the nursery stock IHS

70. From November 1993 to July 1998 the Actinidia schedule noted that no pests had been identified for kiwifruit and that imports of nursery stock were to be held in 'high security' PEQ for at least 1 growing season.³⁹
71. In 2003, MAF began a review of the IHS for kiwifruit nursery stock (and at the same time reviewed the seed-for-sowing IHS). This review was largely prompted by the detection of the Apple Stem Grooving Virus in a consignment of kiwifruit nursery stock in PEQ.⁴⁰ MAF's review included a risk analysis: an assessment of the pests associated with kiwifruit nursery stock, a categorisation of their likely effect, and consideration of the most appropriate import requirements.
72. On 28 May 2004 MAF amended the Actinidia schedule for nursery stock imports, imposing the following requirements on imports of dormant cuttings and plants in tissue culture:
- (a) an import permit was required;
 - (b) a Phytosanitary Certificate was required, with the NPPO of the exporting country only to issue a certificate if they were satisfied that the relevant nursery stock had been:
 - (i) inspected and was free from visually detectable regulated pests;
 - (ii) treated for regulated insects/mites as described in MAF's approved treatment paper within 7 days of shipping (cuttings only); and
 - (iii) held in a manner to ensure that infestation/reinfestation does not occur following certification.
 - (c) if satisfied that the pre-shipment activities have been undertaken, the exporting country NPPO must confirm this by recording the relevant treatments;
 - (d) tissue cultures cannot contain charcoal; and
 - (e) all imports must go into a level 3 PEQ facility, where they will be grown for a minimum of six months, with regular inspections, testing and treatment for regulated pests as specified in the document 'Inspection, Testing and Treatment Requirements for Actinidia'.
73. MAF also added Psa as a regulated pest (actionable) for kiwifruit nursery stock. As well as visual inspection in PEQ,⁴¹ each plant must be observed under transmission electron microscopy, and tested for Psa using OCTF/OCTR primers or PAC 1/P22 primers.

³⁹ NASS Standard 155.02.06, Specification for Importation of Nursery Stock, November 1993

⁴⁰ This incident and how it was handled are discussed below at paragraphs 313 - 318.

⁴¹ Plants were required to be inspected at least twice per week during periods of active growth and once per week during dormancy

74. The draft requirements and the risk analysis were published for consultation on 16 March 2004. There were two responses to the consultation: from Horticulture and Food Research Institute of NZ (HortResearch) and from Zespri. Neither of these two respondents raised any concerns about the effectiveness of the proposed regime for kiwifruit nursery stock, and indeed the content of the submissions reflected a desire to facilitate easier access to nursery stock products from offshore.
75. Both HortResearch and Zespri noted the difficulty with obtaining Phytosanitary Certificates for imports from China – with Zespri noting that if quarantine requirements were truly effective then having such Phytosanitary Certificates would add little value.⁴²
76. Only Zespri commented on whether the proposed requirements were appropriate in light of the risk that Psa posed to the industry, commenting “The source of reference material for positive controls for the ASGV [Apple Stem Grooving Virus] (Actinidia infecting strain) virus and *P. syringae pv. actinidiae* needs to be feasible and to be made explicit.”⁴³ The nature of this statement indicates that Zespri did not necessarily share MAF’s concern in 2004 about the possible risks Psa might pose to the kiwifruit industry.
77. We conclude that MAF acted very prudently in 2004 in requiring testing for Psa at a time when there were no calls from the industry for it to do so and, as far as we can tell, when no other countries were imposing similar requirements. We concur with the position expressed by MAF in 2004 that “there has been a thorough import risk analysis for this commodity and phytosanitary measures have been developed commensurate with the risk posed by each organism and sufficient to reduce the chance of their entry.”⁴⁴

The 2006 amendment of the nursery stock IHS

78. On 9 August 2006 MAF amended the Actinidia schedule to remove one of the two options for testing plants for Psa prior to release from quarantine. The internal MAF document produced at the time notes:⁴⁵

“The development of a Diagnostic Protocol for imported Actinidia has identified that the testing method for *P. syringae pv. actinidiae* does not reliably detect the organism. The import health standard advises the use of OCTF/OCTR primers (Sawada *et al.*, 1997) and PAV 1/P22 primers (Scortichini *et al.*, 2002; Table 1) to detect *P. syringae pv. actinidiae* in PCR. However, the OCTF/OCTR primers do not reliably detect *P. syringae pv. actinidiae*. This agrees with the results obtained by Everett *et al.* (unpublished results). It is

⁴² HortResearch submission to MAF, 7 May 2004. Zespri submission to MAF, 7 May 2004.

⁴³ Zespri submission to MAF, 7 May 2004, p4

⁴⁴ ‘Recommendation for the Amendment and Re-issuance of an Import Health Standard’ (28 May 2004)

⁴⁵ ‘Recommendation for the Amendment and Re-issuance of an Import Health Standard’ (9 August 2006)

recommended that the option for use of OCTR/OCTR primers be removed.”

79. MAF acted promptly when it became aware that one of the options for testing for Psa was unreliable. The first consignment of kiwifruit nursery stock to be released from quarantine occurred on 21 December 2007,⁴⁶ so there was no risk that a consignment was released after wrongly testing negative by this ineffective tester.
80. MAF considered this to be a minor amendment and that it was unnecessary to consult with industry. Stakeholders on MAF’s mailing list were notified of the change and a notification was also placed in the Biosecurity Magazine.
81. We concur with MAF’s decision not to consult on this amendment. The removal of the ineffective tester was a very minor decision and given the lack of concern expressed about Psa at the time we do not consider a consultation would have resulted in any new issues being raised.
82. The key implication to take from this amendment was the fact that considerable reliance was now placed on the ability of the remaining tester – PCR using PAV 1/P 22 primers – to detect Psa prior to release from quarantine (in conjunction with visual inspections).

The import requirements for kiwifruit pollen were inadequate prior to 2009

83. The import requirements for pollen prior to 2009 were inadequate in light of the information that was available to MAF at that time. MAF staff did not adequately recognise the risks associated with the importation of kiwifruit pollen until after the outbreak of Psa was detected in New Zealand.
84. The importation of pollen was permitted on the basis of a literature review, co-authored by MAF and Auckland University staff, which was unnecessarily definitive in ruling out pollen as a potential vector for bacterial pathogens. Based on this report MAF staff naturally assumed that pollen to be a very low-risk pathway.
85. Regardless of the veracity of the available science on whether pollen was a possible vector for Psa, MAF staff did not recognise that imports of pollen would inevitably contain microscopic plant contaminants as by-products of the milling process. As plant material was clearly recognised at the time to be a known vector for Psa, MAF’s inability to recognise this piece of information was a very serious oversight.
86. We further conclude that MAF should have undertaken a formal risk analysis of pollen imports and consulted industry prior to issuing the first pollen import permit.

⁴⁶ MAF Tracing Report, p22

The relevant Import Health Standard

87. The artificial pollination of kiwifruit orchards has become more prevalent over recent years, with evidence showing that it can result in significantly higher crop volumes with corresponding financial benefits for growers.⁴⁷ Volumes of pollen can be blown through orchards using large air fans or can be sprayed onto vines in a liquid form. Suppliers of the pollen used for this process will make their decision on whether to source their pollen domestically or from offshore based on a wide range of factors, including the availability and the relative costs of supply.
88. The requirements governing imports of pollen are set out within IHS 155.02.06 *Importation of Nursery Stock*.
89. The import requirements for pollen in place when the Biosecurity Act 1993 came into force were specified in the Nursery Stock IHS as: “Pollen: A prior permit to import must be obtained from the Permit Officer, MAF Lynfield”.⁴⁸ This requirement was a ‘basic’ rather than kiwifruit-specific condition under the IHS, meaning that all imports of pollen species were subject to the same requirement to contact the relevant Permit Officer for an import permit.
90. Despite imports of kiwifruit pollen being technically possible from at least 1993, the first time MAF was asked to consider issuing an import permit for kiwifruit pollen was in November 2006. Prior to the outbreak of Psa MAF issued eight import permits to Kiwi Pollen to import kiwifruit pollen,⁴⁹ and three import permits to Plant & Food Research (Plant & Food).⁵⁰ The main details of each import permit are reproduced in Appendix 5.
91. Each of the Kiwi Pollen import permits allowed the import of unlimited quantities of pollen from a specified country, typically for a 12 month period.⁵¹ Kiwi Pollen’s imports were subject to the following requirements:
- (a) “Unopened male flower buds must be hand collected”
 - (b) “The pollen may be milled prior to import”⁵²
 - (c) “All consignments must be accompanied by a phytosanitary certificate issued by the National Plant Protection Organisation of the exporting country with

⁴⁷ An article in the July/August 2008 edition of the Kiwifruit Journal indicated that improved pollination could result in gains of \$3,622-\$6,415 per Hectare. It is estimated 20-30% of kiwifruit orchards supplement bee pollination with artificial pollination, NZPA ‘Call to Stop Artificial Kiwifruit Pollination’, 21 November 2010.

⁴⁸ NASS Standard 155.02.06: Importation of Nursery Stock, paragraph 2.2.3. The words ‘MAF Lynfield’ had been removed by 2003.

⁴⁹ With the first issued on 16 April 2007 and the last issued 9 June 2010

⁵⁰ With the first issued on 5 March 2010 and the last issued 12 May 2011

⁵¹ With the exception of Permit 2008034955 (issued 15 August 2008), which was for a single consignment of New Zealand pollen to be re-imported after being exported to Thailand.

⁵² Two of the permits issued and never used stated that those buds had to be milled prior to import (permits 2007031028 and 2007033015).

the following Additional Declaration: “The male flower buds were hand collected and unopened.”

- (d) As per the Nursery Stock IHS, all imports are subject to a border inspection in New Zealand for visually detectable pests.⁵³
92. The Plant & Food import permits imposed very stringent conditions when compared with those for Kiwi Pollen: including that the pollen must not leave the transitional facility into which it was taken, that a record must be kept of the status of all imported pollen, and that any pollen remaining after analysis must be destroyed. Rather than reflecting a view that the pollen represented a possible biosecurity hazard these controls were imposed because Plant & Food chose not to import their pollen under the Nursery Stock IHS, but rather two separate IHSs: *154.02.17 (Standard – Transitional Facilities for Biological Products)* and *154.03.02 (Facilities for Microorganisms and Cell Cultures: 2007a)*. The Plant & Food imports of pollen were therefore automatically subject to more stringent laboratory-controls.

A 2007 scientific review understated the risks associated with pollen

93. MAF staff have stated that their decision to allow the importation of kiwifruit pollen into New Zealand was based on a scientific review published in 2007: ‘Plant Pathogens Transmitted by Pollen’ by S. Card (MAF), M. Pearson (Auckland University) and G. Clover (MAF).
94. Given that MAF’s decision to allow pollen imports to take place rested on this 2007 scientific paper it is important to comment on its substance. This is not done from a scientific perspective but rather an evidentiary one – that is, considering whether the paper adequately reflected scientific knowledge available at the time. In our view that paper was unnecessarily definitive when it concluded that pollen could not transmit bacteria. This is likely to be due to the fact that the issue of pollen-transmission of bacteria was tangential to the real focus of the paper, that of the risks associated with viruses and viroids.
95. The drafting of the paper was initiated by MAF’s Investigation and Diagnostic Centre (IDC) with the purpose being “to assist the risk analysis process by identifying the pests and diseases transmitted by pollen”.⁵⁴ The paper examined pollen generally (as opposed to kiwifruit pollen) and examined the risks of pollen transmitting any manner of pests, including viruses, viroids, fungi, insects, bacteria and other pests.
96. MAF advises that typically such papers are only subject to internal review, but on this occasion it was also sent for peer review to a professor of plant pathology at Auckland University. Early on in the process of peer review it became clear that there might be an interest in the paper being published in an academic journal. As

⁵³ Nursery Stock IHS, paragraph 2.1

⁵⁴ Comment tracked on draft circulated on 2 November 2006

such the Biosecurity New Zealand header was removed from the paper and it became a ‘manuscript’ that was subsequently accepted for publication by the journal, *Australasian Plant Pathology*. An early draft of the paper (retaining the letterhead and not reflecting many subsequent changes) was placed on MAF’s electronic file classification system.

97. There was only one sentence in the paper that covered the risk of pollen-transmission of bacteria. In an initial draft that sentence read, “[t]here are no known bacteria or mollicutes that are pollen transmitted (Nemeth, 1986b).”⁵⁵ However, by the time the fourth draft of the paper had been circulated the sentence had been amended to read “There are no pollen-transmitted bacteria...”⁵⁶ The published version of the paper also contained the same unqualified statement that bacteria cannot be transmitted by pollen.
98. In our view the authors’ position that pollen could not transmit bacteria was unnecessarily definitive in light of the available evidence. We note that the original position that there was ‘no known’ pollen-transmitted bacteria was considerably strengthened through the editing process without any new material coming to light; the final paper omits the qualifier that the authors are only recounting the views of another author (Nemeth); and the sole reference for the authors’ views on bacteria was a scientific paper that was over 20 years old by the time their paper was published.⁵⁷
99. In an interview one of the authors stated that, while the paper examined a wide range of pathogens transmitted by pollen, the clear focus of the paper was on viruses and viroids. The paper was never intended to provide a comprehensive examination of the risks associated with pollen (let alone with kiwifruit pollen) but was rather a literature review intended to serve as an input into a more formal risk analysis. The sole sentence on bacteria was included for completeness and the deletion of the qualifier (“no known bacteria...”) regarding bacteria-transmission was because pollen-transmission of bacteria was considered a peripheral issue to the main focus of the paper.
100. These observations about the relatively narrow scope of the scientific paper are supported by some reservations expressed at the time by the Risk Analysis Team regarding the content of the paper:⁵⁸
 - “What about other diseases and pests?? Or is this just a review of viruses with the rest tacked on bit [sic] with little regard as the author is a virologist?”
 - “This report is a summary of information rather than an analysis.”

⁵⁵ Draft of paper circulated 2 November 2006, page 7

⁵⁶ Draft of paper circulated 8 February 2007, page 3

⁵⁷ In his peer review of the paper Professor Pearson twice expressed concern about relying on an academic paper written in 1993 when making comments on the risks posed by viroids, while the article examining bacteria was written in 1986.

⁵⁸ Comment tracked on version sent by Senior Adviser, Risk Analysis Team, 13 October 2006

- In response to an earlier draft that noted that there were reports of bacteria and fungi being found on pollen a Senior Advisor from the Risk Analysis Team commented, “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.”
101. We have also been able to discover several academic articles that had been published prior to this 2007 paper, which call into question whether pollen could potentially transmit bacteria. A 1980 paper titled ‘The Role of Seed and Pollen in the Spread of Plant Pathogens Particularly Viruses’ noted “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.”⁵⁹ The author concluded “A number of viruses, as well as a few bacteria and fungi, are pollen transmitted.” Other relevant observations made prior to 2007 that undermine the conclusion that there are no pollen-transmitted bacteria include:
- *Xanthomonas juglandis* (walnut bacterial blight) was found to contaminate pollen, with transmission proven through experimental pollination by separate scientists.⁶⁰
 - *Erwinia stewartii* (maize bacterial wilt) may infect maize pollen and pollen transmission may occur.⁶¹
 - *Xanthomonas arboricola* *pv.* *corylina* (bacterial blight of walnut) was suggested to be transmitted by pollen to female flowers.⁶²
102. We conclude that the 2007 scientific paper co-authored by MAF and Auckland University staff overstated the case that pollen could not transmit bacterial pests. By itself this oversight is not concerning, particularly given that bacteria was not the main focus of the report. However, the ramifications are potentially very significant. As this report will demonstrate, pollen was subsequently assumed by MAF staff to be a negligible risk pathway and our impression is that pollen largely disappeared off MAF’s radar – even when evidence subsequently emerged that undermined the initial assessment of the risks of pollen.

MAF did not recognise the presence of plant contaminants in pollen imports

103. Even if one accepts the position in the 2007 scientific paper that there are no pollen-transmitted bacteria, this assessment does not exclude the possibility of pollen imports being contaminated by other plant material. MAF’s subsequent assessment of the risks posed by imports of kiwifruit pollen failed to adequately reflect this fact.

⁵⁹ HC Phatak ‘The Role of Seed and Pollen in the Spread of Plant Pathogens Particularly Viruses’ (1980) *Tropical Pest Management* 26(3) 278-285

⁶⁰ PA Ark ‘Pollen as a Source of Walnut Bacterial Blight Infection’ (1944) *Phytopathology* 34, 330-334. Confirmed by later experiments, JF Bradbury, *Xanthomonas juglandis*: IMI Descriptions of Fungi and Bacteria, No.130 (1967)

⁶¹ HC Phatak ‘The Role of Seed and Pollen in the Spread of Plant Pathogens Particularly Viruses’ (1980) *Tropical Pest Management* 26(3) 278-285

⁶² *ibid*

104. The first enquiry regarding a kiwifruit pollen import permit was made by Kiwi Pollen on 23 November 2006,⁶³ which was incidentally at the same time MAF was circulating drafts of its scientific research on pollen (as above). The subsequent email exchanges provide a useful insight into how MAF perceived the risks posed by pollen and the extent to which they saw any need to impose conditions on the collection and import of pollen:

Email	Relevant Excerpts
23 November 2006, 11:36am Email from Kiwi Pollen to MAF staff member	<p>“Our company wishes to import frozen male kiwifruit pollen from Italy and China. Species: <i>Actinidia deliciosa</i> Var: Hayward.</p> <p>The pollen is collected by milling unopened male flower buds, extracting the pollen and freezing.</p> <p>The pollen will be used for pollinating kiwifruit in orchards in New Zealand.</p> <p>We have not imported kiwifruit pollen before.</p> <p>We have imported some Nashi pear pollen in the past.”</p>
The enquiry was forwarded to a number of MAF staff members for comment	
6 December 2006, 6:07pm Internal MAF email	<p>“...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 [named staff member] and Risk Analysis and externally by the University of Auckland.</p> <p>....</p> <p>As you will see there are no pests or diseases known to be associated with pollen of <i>Actinidia</i> spp.”</p>
8 December 2006, 11.54am Email from MAF staff member to Kiwi Pollen	<p>“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 [sic].</p> <p>....</p> <p>Could you please confirm that the unopened flowers are milled in Italy, rather than here after arrival.”</p>

⁶³ MAF notes that their IMPACT and QuanCargo databases only record information back as far as 1998 and they cannot rule out that import permits for kiwifruit pollen were granted before this time.

Email	Relevant Excerpts
<p>8 December 2006, 12:32pm Email from Kiwi Pollen to MAF staff member</p>	<p>“Please would you confirm that this applies to pollen from China also. You have mentioned Italy in the email, but not China.</p> <p>To clarify about the location of the milling: 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 processed there.”</p>

After a delay by Kiwi Pollen in formally submitting an application, permit number 2007031028 was issued 16 April 2007 for imports of pollen from China. The permit was never used.

<p>28 May 2007, 3.50pm Email from MAF staff member to Kiwi Pollen</p>	<p>“Was good to meet with you last week and talk about the possibility of importing ‘vacuum collected’ pollen from Italy.</p> <p>...</p> <p>The current measure of importing pollen milled from hand collected unopened flowers is implemented to mitigate the risk of hitchhikers (e.g. 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.</p> <p>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 given an approval for this method of collection.”</p>
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105. MAF’s refusal to allow imports of pollen that had been vacuum collected was appropriate and very clearly reasoned: although MAF was not concerned about the risks of pollen *per se*, staff recognised the risks posed by a collection process that might allow for the pollen to be contaminated by insects and the inclusion of other plant material as bycatch. The MAF staff member noted that vacuuming up such debris posed a biosecurity risk as any material that was of a similar size to pollen grains would pass through the sieve and would then be imported to New Zealand.
106. However, MAF did not recognise that all imports of pollen, hand-harvested or not, will inevitably contain some extraneous plant material. Kiwi Pollen has described the process used to mill pollen as:⁶⁴

“Milled pollen, as we know it, is produced by macerating closed flowers and, using a cyclone, extracting the dried pollen to a jar

⁶⁴ Email from Kiwi Pollen to Sapere Research Group, 10 April 2012, 5:26pm

through a gauze which is large enough for the pollen to pass through, but too fine for anything larger than pollen to pass through.”

107. Kiwi Pollen advise that through this process parts of the ‘filament’ inside the flower bud pass through the gauze and into the collection jar if they are the same size or smaller than the pollen being collected. The presence of such plant debris has been confirmed when pollen samples are tested under a microscope for germinability.⁶⁵
108. So although MAF refused to allow imports of vacuum-collected pollen to take place partly out of concern that small grains of extraneous plant debris might also be imported, that exact same risk was present (and unrecognised) with respect to hand-harvested pollen. This is a concern because plant material (with the exception of pollen) had been recognised by MAF as the prime pathway for Psa transmission and since 2004 imports of such plant material were required to be tested for Psa. We conclude that microscopic plant material would have accompanied pollen imports into New Zealand.
109. It does not appear that anyone appreciated that the 2007 scientific paper, relied on as the basis for allowing pollen imports, focused on the risks associated with what can be termed ‘pure’ pollen rather than industrially-processed pollen and the plant material that must inevitably accompany it. When asked to comment on the initial application for an import permit the author of the scientific paper emailed to the staff member handling the permit, “As you will see there are no pests or diseases known to be associated with pollen of *Actinidia* spp.”⁶⁶ While this statement may or may not be accurate for naturally-released pollen it fails to recognise that industrially-milled pollen will never be pure.
110. The ramifications of MAF not identifying that pollen imports would inevitably have included plant contaminants (a known vector for Psa) may well have been significant.

MAF should have undertaken a formal risk analysis for imports of kiwifruit pollen

111. MAF advises that the existence of the 2007 scientific paper on pollen satisfied staff that any risks with pollen could be adequately managed without the need for a formal risk analysis.⁶⁷ MAF noted:⁶⁸

“MAF has limited resources and must prioritise these resources to known areas of risk/concern/uncertainty. MAF does conduct risk assessments or take precautionary action when data/information indicates it needs to.”

⁶⁵ *ibid*

⁶⁶ Internal MAF email, 6 December 2006, 6:07pm

⁶⁷ Interview with MAF staff, 21 March 2012

⁶⁸ Email from Peter Thomson to Sapere Research Group, 16 April 2012, 3:57pm

112. This quote reflects a reasonable approach to prioritising risk management: in the face of competing demands for staff resources it is to be expected that the application of staff will be prioritised based on the likely value they will add. In other words, in a case where there is a scientific statement that pollen cannot transmit bacteria there is likely to be little to be gained from digging further.
113. While we agree that MAF must prioritise its resources to address actual cases of uncertainty and biosecurity risk, this is a case where, even with the presence of a scientific report, staff should have recognised the value of formally undertaking a risk analysis. There are a number of factors that when combined mean that a case should have been made to undertake a risk analysis on imports of kiwifruit pollen:
- (a) Kiwifruit pollen had not previously been imported into New Zealand, meaning that a failure to accurately identify and manage risks with the imports could have significant and irreversible consequences.
 - (b) The pollen was proposed to be used for artificial propagation, meaning that any associated pest incursion would be unlikely to be localised.
 - (c) This was not a case of MAF considering there to be zero risk from pollen imports, which supports the view that a formal process for documenting and evaluating all possible risks would have been useful. Through a very informal exchange of emails staff had quickly identified some level of biosecurity risk from pollen imports, which is why they required imported pollen to be sourced from hand-harvested, unopened flower buds.⁶⁹
 - (d) It is also apparent from emails sent at the time that there was some uncertainty amongst MAF staff regarding precisely how the pollen would be sourced and milled and the level of biosecurity risk this might create.⁷⁰
 - (e) The economic significance of the kiwifruit industry is such that a thorough assessment of the risks from pollen imports was justified.
 - (f) Although the 2007 scientific paper stated that pollen could not transmit bacteria, the paper explicitly states that it was only ever intended to be an input into a risk analysis rather than being a standalone assessment of the risks of pollen.
114. An interview with the Manager of the Risk Analysis Team confirms that she was aware that her team had raised issues about uncertainty of science around pollen in 2007.⁷¹ However, it is relevant to note that several months later a member of the Risk Analysis Team gave “sign-off” to using the conclusions of the 2007 scientific paper when considering import permit applications for kiwifruit pollen.⁷²

⁶⁹ Emails reproduced above at paragraph 104.

⁷⁰ Email from MAF staff member to Kiwi Pollen, 8 December 2006, 11.54am

⁷¹ Interview with Biosecurity Risk Analysis Manager, 21 March 2010

⁷² Email from MAF staff member, 13 April 2007, 11:12am

115. We are satisfied that a risk analysis was not required when the provisions in the Nursery Stock IHS governing the import of pollen were established. Those provisions simply noted that pollen could be imported subject to requirements imposed through the import permit, meaning MAF was effectively deferring the need to assess the risks associated with pollen until it received an application for an import permit. MAF should have initiated a formal risk analysis of kiwifruit pollen imports when it received the first import permit application in early 2007.
116. Such a risk analysis would have extended beyond the narrow issue of whether pollen could transmit bacteria or viruses.⁷³ If a formal risk analysis had been carried out we would have expected MAF to have:
- explored in detail the process by which pollen is harvested and milled, including identifying that an inevitable outcome of the milling process for pollen is that some plant material would accompany imports;
 - identified Psa as a relevant pest that might be transmitted by the accompanying plant material. While there was no evidence in 2007 that might suggest that Psa might infect pollen, there was evidence available at the time that Psa could be detected on kiwifruit flower buds;⁷⁴
 - assessed the likelihood of Psa (and other pests) entering the country and consequences that such pests might have for the kiwifruit industry;
 - considered the extent to which any risks with pollen might vary from country-to-country and the factors that should be taken into account when MAF staff received an application for an import permit;
 - considered whether the risk profile of pollen imports varied depending on the intended use of the pollen (e.g. selective use for breeding purposes in a laboratory environment versus widespread artificial pollination throughout the country); and
 - considered the extent to which pest risk management steps were required and the extent to which these standards would adequately mitigate any risks associated with importation (steps were taken to minimise the prospect of some ‘hitch-hikers’ accompanying the pollen, but one would reasonably expect that MAF might also consider whether additional measures were needed to manage the risks posed by plant contaminants, such as testing the pollen for Psa or requiring plants to be pollinated in a controlled environment).

⁷³ The 2007 scientific paper on the risks associated with generic ‘pollen’ did not constitute a Risk Analysis and was only intended “to assist the risk analysis process”. Comment tracked on draft circulated on 2 November 2006.

⁷⁴ See Serizawa , Ichikawa, Takikawa, Tsuyumu, Goto (1989) ‘Occurrence of Bacterial Canker of Kiwifruit in Japan: Description of Symptoms, Isolation of the Pathogen and Screening of Bactericides’ *Annals of the Phytopathological Society of Japan* 55(4), 427-436.

MAF should have consulted with industry prior to allowing the import of kiwifruit pollen

117. Interviews with industry have highlighted what many appear to consider a significant shortfall on the part of MAF: that MAF failed to consult with the industry prior to allowing imports of pollen to take place.
118. The assertion by some in the industry is that a consultation would not only have allowed them to register possible concerns about pollen at the time, but that awareness pollen imports may be taking place might have prompted them to raise concerns when the Italian Psa outbreak occurred years later.
119. We conclude that MAF was correct in not consulting industry on the provisions for pollen importation contained in the IHS, but they should have subsequently consulted industry when a decision was made to allow kiwifruit pollen imports to take place for the first time. While MAF staff genuinely considered the importation of pollen to be a negligible risk, as with the need to undertake a formal risk analysis, we consider there were enough features present to justify some level of industry consultation.

MAF was correct not to consult on the pollen-specific provision in the IHS

120. As noted above, in 2004 the Actinidia-specific schedule was added to the Nursery Stock IHS. Although there was a public consultation at the time on the new requirements for kiwifruit nursery stock, only the draft schedule was distributed for consultation – meaning that industry was not invited to comment on the rest of the IHS provisions, including the pollen importation requirements.
121. The provisions in the IHS were so broad (imports of pollen are allowed subject to any requirements contained in an import permit) that it would have been meaningless to consult industry on whether MAF was adequately managing risks through the IHS. The IHS provisions relating to pollen effectively deferred the assessment and management of risks until such time as MAF received an application to import. It is also relevant that the pollen import requirements had been in place since at least 1993 and had remained largely unchanged, meaning MAF had no good cause to consult with the industry on the IHS post 1993.

Consultation was unnecessary when the IHS was amended in 2004

122. MAF acted appropriately in 2004 in not consulting on the import requirements for pollen, even though it was consulting on the kiwifruit-specific changes to the Nursery Stock IHS.
123. In 2004 there was no proposal to amend the relevant IHS provision for pollen imports, which by then had been in place for at least 11 years. It would have been odd for MAF to have consulted on a continuation of the status quo, particularly when it had yet to receive an application to import and the relevant pollen provisions were not kiwifruit-specific.
124. MAF advises that when a specific schedule is being amended in either the nursery stock or seed-for-sowing IHS, it is normal procedure to only consult on the specific

schedule under consideration. It is relevant that there are 131 specific schedules for nursery stock, covering 19,206 species, including those under the 'basic conditions'. We do not consider it necessary for MAF to have distributed the entire IHS for consultation when only a small proportion (i.e. one schedule) was actually proposed to be amended. The IHS has always been publicly available, so MAF cannot be accused of trying to conceal the fact that pollen imports were legally permissible under the Nursery Stock IHS.

125. We also conclude that, if there had been a consultation in 2004 regarding pollen, the industry would not have raised concerns regarding Psa. Psa was a relatively unknown pest in 2004 and, as was demonstrated above, the industry was not over-concerned about the risks of Psa when submissions were made with respect to nursery stock consultation in 2004 – for what was a recognised pathway for the bacteria.
126. It is plausible however, that if the industry was aware that pollen imports were taking place, they may have raised concerns about the spread of Psa five years later – whether there should have been other mechanisms in place to inform the industry that pollen imports were being undertaken is discussed later in this report.

Consultation was unnecessary when the IHS was amended in 2009

127. On 1 October 2009 MAF amended paragraph 2.2.3 of the Nursery Stock IHS covering the importation of pollen. The amendment retained the current text (“A prior permit to import must be obtained from the Permit Officer”) and added the requirement: “Prior to issuing the permit to import MAFBNZ will assess, on a case by case basis, the requirements that must be met to import the pollen. All import requirements will be detailed on the permit to import.” MAF did not consult on this amendment.
128. We consider MAF acted appropriately in 2009 in not consulting when it amended the import requirement for pollen.
129. MAF is legally obliged to consult on IHS amendment, unless the amendment is urgent or “the chief technical officer considers that the amendment is minor”.⁷⁵ This amendment was clearly minor in nature. It did not change the scope of the goods that could be imported into New Zealand nor the terms under which they could be imported. MAF staff noted in the internal decision document produced at the time that the existing requirements were not clear and that this amendment simply clarified that MAF, on a case-by-case assessment, would make the import of pollen subject to conditions.⁷⁶

⁷⁵ Biosecurity Act 1993, section 22(6)

⁷⁶ ‘Recommendation for the Amendment of an Import Health Standard’, file reference 155.02.06, 1 October 2009

MAF should have recognised the need to consult industry when approving the import of kiwifruit pollen for the first time

130. MAF should have consulted the industry when it reached a provisional view in early 2007 that the first import for kiwifruit pollen should be approved. It was at this point MAF needed to have all relevant information about risk and to give stakeholders the opportunity to comment on whether the organisation had appropriately managed any risk to the kiwifruit industry.
131. Although MAF was under no legal obligation to consult at this point,⁷⁷ it had previously issued a public commitment to consult in a wide range of circumstances:⁷⁸
- “MAF Biosecurity will consult whenever its proposed actions are likely to have a significant effect on people or organisations outside MAF. This may include consultation on standards, risk analyses, pest management strategies, policy statements (excluding policies dealing only with internal administration) and legislation.
- Consultation should be on a document containing the proposed decision, but it may also take place when MAF Biosecurity is developing its policy stance on an issue.
- MAF Biosecurity has a role in informing interested parties on the issues under discussion, New Zealand biosecurity in general, and relevant government processes.”
132. While MAF staff genuinely considered the importation of kiwifruit pollen to be a negligible risk, as with the need to undertake a formal risk analysis, we consider there were enough features present to justify some level of industry consultation.
133. Consultation at this point would also have been prudent given MAF was about to allow the import of new biological material for the first time; that there was a recent scientific paper on the risks associated with pollen that had not yet been discussed with stakeholders; that MAF had identified some risks with the importation of pollen and had put in place mitigation strategies (such as requiring pollen to be sourced from hand-picked unopened flowers); and that MAF should have been aware that the implications of having inappropriate standards could be significant given that the pollen was intended for artificial pollination purposes (i.e. it would not be used in a controlled environment). In this case consultation might have prompted industry to raise some questions about the likely by-products from the milling process, and would also have provided valuable transparency for the industry as to possible new pathways for pests.

⁷⁷ The legal obligation on MAF to consult with stakeholders regarding import conditions applies to when MAF creates or amends an IHS, not when issuing an import permit.

⁷⁸ ‘MAF Biosecurity Authority Policy Statement on Consultation’, signed 29 February 2000. MAF re-stated on 31 October 2006 that it was committed to following this Policy Statement on Consultation (Memorandum of Understanding on biosecurity activities between Ministry of Agriculture and Forestry and Department of Conservation, Ministry of Fisheries, and Ministry of Health).

134. We cannot assess whether those approving the initial import permit considered there was absolutely no risk from pollen imports so therefore no need to consult (which is not plausible given they had identified some risks by virtue of requiring flower buds to be hand-harvested), whether there was an assumption that there had already been a consultation on the IHS (there had not), or whether the possibility of consulting with stakeholders would even register as a possible option for those MAF staff members who process permit applications – given it is not a legal requirement.
135. Whatever the reason, it is concerning that imports of pollen were able to take place without any public notification or consultation on the potential risks to the kiwifruit industry. This is not to suggest that MAF should have consulted on the specificities of the Kiwi Pollen application for an import permit, but rather that a case existed for MAF to publicly note that it had considered and reached a position on allowing kiwifruit pollen into the country and to seek feedback on how it was managing the risks it had identified. MAF’s consultation policy notes that consultation may be undertaken on “standards, risk analyses, pest management strategies”, which signals an intention to consult on all manner of decisions that might have serious implications for the industry.

The pollen import permits reflected MAF’s view that pollen posed only a minimal risk

136. Although there are areas of concern regarding the appropriateness of the import requirements for kiwifruit pollen, it is pertinent to note that import conditions imposed reflected MAF’s view that the risks associated with pollen imports were negligible.
137. Below we examine specific aspects of the permits that may or may not have been appropriate.

MAF acted appropriately in relying on the assurances provided by the NPPOs

138. A key tenet of world trade in plant material is that biosecurity agencies need to be able to rely on assurances provided by their overseas counterparts, as it would be completely impractical for each country to set up their own verification measures in the exporting country.⁷⁹
139. The countries certifying that the pollen was hand-collected from unopened flower buds would have their own processes to be satisfied the conditions were met. The harvesting of individual pollen consignments would certainly not have been witnessed by the NPPO,⁸⁰ who would instead satisfy themselves that the terms of

⁷⁹ Note, MAF may make specific arrangements with an exporting country through the Bilateral Quarantine Arrangement or an Official Assurance Programme. Whether specific arrangements are put in place depend on the risks identified with a particular pathway or the sheer volume of exports taking place (i.e. MAF inspection of cars being exported from Japan in Japan).

⁸⁰ Witnessing the individual harvesting of all plant material in the expectation that some of it might eventually be exported would simply be too onerous and resource intensive for NPPOs to carry out.

the phytosanitary measures had been met through other measures, such as regular inspections or requiring declarations from the exporter as to the means of harvest.

140. There is an inherent risk that a NPPO may not have rigorous processes for certifying the terms of the phytosanitary measures are met. However, these concerns, if they legitimately exist, can be managed through more stringent border inspections and testing of the imported products by MAF. It was entirely reasonable for MAF to rely on the certifications provided by those countries where pollen was being imported from (Chile and China).

Origin of the pollen

141. We are aware of some speculation that, although the MAF import permits specified the country of origin for the pollen consignments, it is possible that the imported pollen might have initially originated in a third country.⁸¹ The evidence available suggests that this would be an extremely unlikely scenario.
142. The pollen import permits all specified a “country of origin” for the consignments. The term “country of origin” is an official term and under the *International Standards for Phytosanitary Measures No. 1 to 32 (2009 edition)*, the term refers to the “Country where the plants from which the plant products are derived were grown.” When the Chilean and Chinese NPPOs issued Phytosanitary Certificates for the consignments of pollen leaving the country they had to be satisfied that the pollen was sourced from within that country.
143. For completeness we note that Kiwi Pollen claims to be able to provide total traceability for its pollen imports: the pollen imported from Chile was sourced from orchards they have a joint venture in, using equipment they exported from New Zealand and using the same processes Kiwi Pollen uses when harvesting pollen in New Zealand.

The wording of the import permits may have led to confusion as to what constituted ‘pollen’

144. The first two Kiwi Pollen import permits required the harvested flower buds to be milled offshore prior to the importation of the pollen. This was changed for later permits, with the import permits stating that the pollen “may” be milled offshore. On receipt of the first import application MAF specifically sought assurances from Kiwi Pollen that the flower buds would be milled offshore⁸² (presumably to reduce the prospect of infected flower buds being discarded once in New Zealand), so it is peculiar that MAF subsequently made this an optional requirement.
145. One may consider this to be purely academic since the only way for ‘pollen’ to be imported is to mill the flower buds offshore in order to separate the pollen grains from the rest of the flower. However, by specifying that offshore milling was

⁸¹ Including for example, Tony Wall, ‘Kiwifruit Disease: Govt may be at Fault’ *The Dominion Post*, 18 December 2011; and Kent Atkinson "Otago scientists tracing Psa's pathway across border" 4 April 2012 (<http://www.sciencemediacentre.co.nz/2012/04/04/otago-scientists-tracing-psas-pathway-across-border>)

⁸² Email from MAF staff member, 8 December 2006, 11.54am

optional MAF may have created some uncertainty as to whether other parts of the flower bud could be imported to New Zealand under a pollen import permit.

146. As will be examined later in this paper,⁸³ an import of anthers was made under a pollen import permit. Independent advice provided to us is that ‘anthers’ cannot be considered to be ‘pollen’ and that the consignment should not have been cleared for entry into New Zealand. The granting of border clearance to a consignment of anthers may have been due to an inability by border staff to recognise that ‘anthers’ were not ‘pollen’. Or it could instead have been due to the vague import permit, which appears to envisage a scenario where pollen could be imported into New Zealand, yet still be milled onshore.

The import requirements for kiwifruit were appropriate prior to 2009

147. The import requirements that were in place for kiwifruit up until 2009 were appropriate. The import requirements reflected a scientific consensus that the import of fruit would not be a vector for Psa.

The relevant Import Health Standard

148. Although New Zealand is a net exporter of kiwifruit, significant volumes of kiwifruit imports take place, particularly in the off-season for domestic production (December to February). From 2000 to 2011, imports of kiwifruit increased from approximately 200 tonnes p.a. to nearly 1,000 tonnes p.a. (compared with exports of approximately 350,000 tonnes p.a.).⁸⁴
149. The requirements governing imports of kiwifruit are set out within IHS 155.02: *Importation and Clearance of Fresh Fruit and Vegetables into New Zealand*. Imports of green kiwifruit are permitted from Italy and the United States of America (USA).
150. The IHS for imports of green kiwifruit from Italy was approved in 1999. Such imports are subject to conditions that include:⁸⁵
- (a) pre-export inspection by the Italian NPPO for visually detectable regulated pests;
 - (b) the goods must be accompanied by a Phytosanitary Certificate stating that:
 - (i) the consignment has been inspected and found free of visually detectable pests; and

⁸³ In paragraphs 322 - 325

⁸⁴ From 2000 to 2011, 6,900 tonnes of kiwifruit were imported into New Zealand.

⁸⁵ Import Health Standard, Commodity Sub-class: Fresh Fruit/Vegetables Kiwifruit, *Actinidia deliciosa* from Italy, issued 22 December 1999 (<http://www.biosecurity.govt.nz/files/ihs/kiwifruit-it.pdf>)

- (ii) have been subject to ‘cold disinfection’: with varying options between holding the fruit at 0°C or below for 10 days, through to 2.22°C or below for 16 days.
 - (c) the kiwifruit must be packed and shipped in a manner that prevents contamination from regulated pests (including not being opened in transit);
 - (d) MAF will inspect the consignment on arrival for visually detectable regulated pests; and
 - (e) no import permits are required.
151. Imports of green kiwifruit from the USA are subject to very similar requirements, except that rather than requiring cold disinfection, the kiwifruit must be sourced from California – a fruit fly pest free area.⁸⁶ Imports of kiwifruit from the USA have been permitted since 1981, when a Gazette notice was published pursuant to the Introduction and Quarantine of Plants Regulations 1973. This market access was rolled over into the 152.02 IHS, meaning USA access has been continuous for over 30 years.
152. Of relevance to this paper is that in the period to 2009 MAF did not identify Psa as a regulated pest for imports of kiwifruit from Italy and the USA.
153. MAF undertook a risk analysis for the IHS for Italian kiwifruit. This analysis specifically considered the risks of Psa transmission via imported fruit, as the pest was widely reported to be present in Italy. The analysis concluded that there was scientific consensus that there was no evidence at the time to indicate that mature fruit might be a pathway for the entry, establishment and spread of Psa.
154. This position is consistent with available scientific advice at the time that Psa was not considered to be transferred via the movement of fruit. The ‘cold disinfection’ treatment in place for kiwifruit imports from Italy was not designed to combat the threat of Psa, but rather to combat the risk of fruit fly – a major source of biosecurity concern.
155. MAF consulted with stakeholders regarding the relevant import requirements for kiwifruit imports.⁸⁷

⁸⁶ IHS 155.02: *Importation and Clearance of Fresh Fruit and Vegetables into New Zealand.*

⁸⁷ It has not proven possible to locate the relevant consultation documents, but we are satisfied these consultations took place. The former Chief Technical Officer has stated that a consultation on the Italian kiwifruit IHS “would most certainly have been undertaken”, while the transposition of the import requirements into an IHS for USA kiwifruit imports would have been considered by an industry group, as per the ‘Minutes Of the Meeting of the Agricultural Security Consultative Committee (Plants)’ (14 September 1995) (email to Sapere Research Group, 30 April 2012, 9:54am).

The import requirements for kiwifruit seeds were appropriate prior to 2009

156. The import requirements that were in place for kiwifruit seeds up until 2009 were appropriate. The import requirements reflected scientific consensus that the import of kiwifruit seeds would not be a vector for Psa.

The Import Health Standard

157. The importation of kiwifruit seeds, as with nursery stock, is an important means to allow domestic industry to source new varieties of kiwifruit from offshore.
158. The requirements governing imports of kiwifruit seeds are set out within IHS 155.02.05: *Importation of Seed for Sowing*.

The 2004 consultation

159. On 17 March 2004, MAF published a draft Actinidia schedule to the Seed for Sowing IHS. This was published on the same day as the proposed revisions to the Nursery Stock IHS as part of the wholesale review of the import requirements for kiwifruit plant material. MAF proposed that kiwifruit seeds be subject to the following requirements:
- (a) 'Basic conditions', including a requirement for the seeds to be clean, in new packages and clearly labelled.
 - (b) A Phytosanitary Certificate documenting that the consignment has been inspected by the NPPO and is free of visually detectable regulated pests (this requirement may be waived on a case-by-case basis and detailed on the import permit).
 - (c) An import permit is required.
 - (d) All kiwifruit seeds must be imported into a Level 3 PEQ, to be grown for at least six months with regular inspections and testing (i.e. plants rather than seeds would end up being released).
160. The only actionable pest that MAF identified with kiwifruit seeds was the Apple Stem Grooving Virus. This viewpoint was unchallenged by respondents to the consultation. Respondents also had the opportunity to comment on MAF's risk analysis for kiwifruit seeds, which was published as part of the consultation. This analysis documented available scientific evidence and concluded that Apple Stem Grooving Virus was the only pest that should be regulated for such imports.
161. The only significant comment from respondents⁸⁸ to this consultation was from HortResearch, who suggested that a Level 2 PEQ facility might be more appropriate

⁸⁸ As with the Nursery Stock consultation being undertaken at the same time, both Zespri and HortResearch made submissions on the Seed for Sowing consultation.

for growing the seedlings.⁸⁹ MAF responded that, “bearing in mind the importance of the industry”, the most secure PEQ facility available was necessary “because so little is known about the biology” of the Apple Stem Grooving Virus.⁹⁰ MAF was clearly adopting a precautionary approach in light of scientific uncertainty, overriding calls from potential importers for less stringent biosecurity protections. The draft IHS was subsequently confirmed on 1 June 2004.

162. MAF’s position was (and still is) that there was no scientific evidence that kiwifruit seeds might transmit Psa. MAF was certainly aware of the risks posed by Psa (having identified Psa as an actionable pest for nursery stock imports at the same time) and had already signalled a willingness to adopt a precautionary approach where needed with respect to the import of seeds.
163. MAF’s analysis of the risks of Psa-transmission via the importation of kiwifruit seeds was robust. While seeds were known vectors of bacteria,⁹¹ kiwifruit seed was considered an unlikely vector for different types of *Pseudomonas* spp. due to its small size and the extraction method.⁹² It is relevant to note that if seeds were indeed a vector for Psa, then fruit (which contains such seeds) would also be a biosecurity risk, and arguably a greater risk given that seeds were required to be grown in quarantine. MAF’s decision not to identify Psa as an actionable pest or to require Psa testing for plants grown in PEQ was reasonable in light of the evidence available at the time.

The import requirements for horticultural equipment were appropriate prior to 2009

164. The import requirements that were in place for horticultural equipment up until 2009 were appropriate. The import requirements were developed to mitigate the risk that used equipment entering the country might include contaminants and pests. There is a board cross-sectoral interest in ensuring the imports of such equipment are clearly screened, inspected and decontaminated if necessary and MAF’s approach appears to be robust.

⁸⁹ On 28 April 2010, a Zespri employee wrote to MAF echoing the view that Level 3 PEQ was unnecessary. Zespri claimed the quarantine requirements for kiwifruit seeds were too onerous and that it was costing Zespri \$1,600 per seedling released.

⁹⁰ MAF ‘Analysis of submissions on draft import health schedules for seed for sowing and nursery stock of *Actinidia*’ (Released for consultation on 17 March 2004)

⁹¹ Goode, Sasser, 1980 ‘Prevention – the key to controlling bacterial spot and bacterial speck of tomato’ *Plant Disease* 64(9): 831-834, and Hollaway, Bretag, Gooden, Hannah (1996) ‘Effect of soil water content and temperature on the transmission of *Pseudomonas syringae* pv. *pisi* from pea seed (*Pisum sativum*) to seedling’ *Australasian Plant Pathology* 25(1): 26-30.

⁹² Hu, Fang, Young, Xie (1998) ‘Identification of the pathogen caused bacterial blight of kiwifruit in China’ *Acta Phytopathologica Sinica* 28(2): 175-181.

The relevant Import Health Standards

165. The importation of used equipment and vehicles has long been recognised as a viable pathway for pests to enter New Zealand. The risks from this pathway are exacerbated for imports of horticultural equipment and vehicles, where there is a much clearer link between a pest-infected orchard overseas and the likelihood that the equipment will be used in a receptive domestic environment. The often complicated construction of equipment and machinery also provides the opportunity for pest concealment, complicating any pest-detection at the border.
166. The most relevant IHS for the purposes of this report is the *IHS for Forestry and Agricultural Equipment from any country*. This IHS was in force from 1998 to 2009 and imposed import requirements on a wide range of used equipment, including tractors, harvesters and the like, and also covered “equipment used in...processing...plants and plant products”.⁹³ The IHS required that prior to import all used equipment must be dismantled, cleaned and be assessed as free of contamination (with certified documentation to this effect), and also be subject to on-arrival inspection with any necessary decontamination and/or treatment (or a combination of inspection abroad and in New Zealand).
167. In 2007 MAF undertook a public consultation on its risk analysis of the import requirements for used vehicles and machinery. This was done in response to incursions of serious pests such as the Asian gypsy moth and the white spotted tussock moth and the ongoing threat posed by the large volume of imported vehicles entering the country.⁹⁴
168. This risk analysis prompted a consolidation in 2009 of a number of existing IHSs into the *IHS for Vehicles, Machinery & Tyres*. This IHS simply states that all vehicles/machinery/tyres imported into New Zealand must be clean, internally and externally and that MAF has broad powers to decontaminate/re-ship/destroy any imports that fail to meet this standard.⁹⁵
169. The import requirements for horticultural equipment were appropriate for managing the risk that Psa might enter the country through contaminated used equipment. The requirements ensured, as far as was reasonably practical, that any imported equipment would be free from contaminants. It is appropriate that the import requirements applied to generic machinery/equipment rather than being tailored on to meet any risk of Psa – the biosecurity risks posed by the import of used equipment are not limited to any one industry and MAF correctly focused on ensuring that no contaminated equipment was entering the country.

⁹³ *IHS for Forestry and Agricultural Equipment from any country* (152-07-04i), definition of ‘Forestry and Agricultural Equipment’

⁹⁴ MAF, ‘Import Risk Analysis: Vehicle and Machinery’, 7 February 2007

⁹⁵ *Import Health Standard for Vehicles, Machinery & Tyres*, October 2009. The IHS also requires imports to be accompanied by appropriate documentation about the nature of the consignment and specifies that certain types of machinery must be fumigated prior to receiving biosecurity clearance.

Summary: the import requirements prior to 2009 were of a mixed standard

170. Based on the available evidence and discussions with stakeholders we conclude that in the period prior to 2009:

- (a) MAF appropriately recognised the risk that Psa posed to the kiwifruit industry in the period to 2009.
- (b) The import requirements for **nursery stock** were appropriate in the period to 2009 and reflected a prudent approach by MAF to managing risk from Psa.
- (c) The import requirements for **kiwifruit pollen** were inadequate in the period to 2009:
 - (i) A 2007 scientific paper co-authored by MAF and Auckland University staff understated the risk of pollen-transmission of bacteria.
 - (ii) MAF staff approving import permits for pollen reasonably relied on this scientific paper in believing that pollen would not transmit Psa.
 - (iii) Irrespective of the scientific evidence for whether pollen could transmit Psa, MAF staff failed to appreciate that the process for milling pollen prior to import would mean the consignments of pollen would inevitably include other plant material (a recognised vector for Psa).
 - (iv) MAF should have undertaken a risk analysis for pollen imports, which might have identified the risks from accompanying plant debris and possible measures to mitigate such risks (such as testing consignments for Psa).
 - (v) MAF was correct not to consult industry on the pollen import requirements in the Nursery Stock IHS.
 - (vi) Although not legally required to do so, MAF should have consulted with industry prior to allowing the first consignment of kiwifruit pollen to enter the country.
- (d) The import requirements for **kiwifruit** were appropriate in the period to 2009.
- (e) The import requirements for **kiwifruit seeds** were appropriate in the period to 2009.
- (f) The import requirements for **horticultural equipment** were appropriate in the period to 2009.

Reviewing the import requirements in changing circumstances

171. This section examines the import requirements that were in place in 2009/2010 and assesses whether they appropriately reflected the information that was emerging regarding Psa. It focuses on the processes MAF had in place to collect intelligence on the risk profile of pests, to monitor scientific developments and to address concerns about possible pathways for Psa into New Zealand.
172. The period 2009/10 was chosen for analysis as it was during this period that a number of key developments occurred, including the observable spread of Psa in other countries and the emergence of concerns about the adequacy of New Zealand's biosecurity settings. It is also relevant that MAF's Tracing Report into the possible means by which Psa entered New Zealand concluded that it is most likely that Psa entered the country sometime from April 2009 onwards.

A damaging outbreak of Psa in Italy

173. Psa has been present in the Italian province of Latina since 1992 and only had a relatively limited economic impact on the industry for many years. This changed when a new outbreak of Psa was identified in 2007/08, which had a considerable impact on the vines and spread much more aggressively than Psa had traditionally done. The effect of this outbreak in subsequent years was particularly pronounced for gold kiwifruit.
174. There appears to be some uncertainty as to precisely when the Italian outbreak got underway. The European and Mediterranean Plant Protection Organization (EPPO) reports that in 2007/08 economic losses began to be observed in the Lazio region of Italy and began to spread to other regions in Italy.⁹⁶ A scientific paper first published online on 31 March 2009 states that the symptoms were observed in Latina in the summer of 2008.⁹⁷ This paper noted that this was the first instance that Psa had been identified as affecting gold kiwifruit in Italy and, as far as they were aware, the world. A scientific paper published in 2011 confirms that new symptoms were present in 2008 and states that the widespread outbreak was identified by February 2009.⁹⁸

⁹⁶ EPPO Alert List, *Pseudomonas syringae* pv. *actinidiae*, http://www.eppo.int/QUARANTINE/Alert_List/bacteria/P_syringae_pv_actinidiae.htm

⁹⁷ Patrizia Ferrante, Marco Scortichini 'Identification of *Pseudomonas syringae* pv. *actinidiae* as Causal Agent of Bacterial Canker of Yellow Kiwifruit (*Actinidia chinensis* Planchon) in Central Italy' *Journal of Phytopathology* (2009) Volume: 157, Issue: 11-12, Pages: 768-770

⁹⁸ Vanneste, J.L., Kay, C., Onorato, R., Yu, J., Cornish, D.A., Spinelli, F. and Max, S. (2011). 'Recent Advances in the Characterisation and Control of *Pseudomonas Syringae* pv. *actinidiae*, the Causal Agent of Bacterial Canker on Kiwifruit' *Acta Hort.* (ISHS) 913:443-455 http://www.actahort.org/books/913/913_59.htm

175. Regardless of the variance in dates, it is reasonable to conclude that by early 2009 the kiwifruit industry in Italy had been affected by Psa in a manner that had not been encountered previously.
176. On 1 November 2009 EPPO issued an alert to its member states regarding the Italian outbreak. It is relevant to note that while pests are added to the Alert List because they may represent a phytosanitary risk, EPPO states the mere issuance of an alert should not be interpreted by itself as a recommendation for introducing phytosanitary measures. Rather it is an early-warning system and may result in further detailed work being done on the associated pathways for that pest.
177. The 2009 EPPO alert noted that impact of the outbreak was particularly severe on gold kiwifruit orchards and that in some instances the destruction of orchards was required. The Alert described the pathway for Psa as “Plants for planting of *Actinidia* spp. (infected fruits cannot be totally excluded but seem very unlikely).”⁹⁹
178. Between March 2010 and June 2010 the Psa outbreak in Italy progressed far more aggressively, indicating that the disease was more active in cold and wet weather and had a rapid progression rate.¹⁰⁰ Surveys being conducted approximately every 20 days on Italian orchards showed that vines showing no symptoms at one inspection could be dead when inspected 20 days later.¹⁰¹
179. In July 2010, under the title ‘Pathogen of the Month’, the Australasian Plant Pathology website published a one page ‘profile’ on Psa. It noted the bacteria was present in Japan, Korea and Italy, stating “Its economical impact can be significant, as is the case with the current outbreak in Latina (Italy).” The profile discussed the symptoms of Psa, its life cycle and how best to control it but did not mention the risk of entry or possible means of transmission.
180. A further EPPO update on 1 August 2010 noted the continued spread of Psa through Italy and confirmed that the outbreak affecting Italy was a different strain of Psa to that previously confirmed in Italy, Japan and Korea.¹⁰² By September 2010 the new strain of Psa had also been found in Portugal and France.¹⁰³

Industry awareness of the Italian Psa outbreak did not translate into action in New Zealand

181. Zespri has licensed kiwifruit varieties into orchards in Italy and it is evident that at senior levels of the organisation there was a keen awareness of the spread of Psa

⁹⁹ EPPO Reporting Service, 1 November 2009, copy provided by MAF.

¹⁰⁰ Vanneste, J.L., Kay, C., Onorato, R., Yu, J., Cornish, D.A., Spinelli, F. and Max, S. (2011). ‘Recent Advances in the Characterisation and Control of *Pseudomonas Syringae* pv. *actinidiae*, the Causal Agent of Bacterial Canker on Kiwifruit’ *Acta Hort.* (ISHS) 913:443-455 http://www.actahort.org/books/913/913_59.htm

¹⁰¹ *ibid*

¹⁰² EPPO Reporting Service, 1 August 2010, copy provided by MAF.

¹⁰³ Vanneste, J.L., Kay, C., Onorato, R., Yu, J., Cornish, D.A., Spinelli, F. and Max, S. (2011). ‘Recent Advances in the Characterisation and Control of *Pseudomonas Syringae* pv. *actinidiae*, the Causal Agent of Bacterial Canker on Kiwifruit’ *Acta Hort.* (ISHS) 913:443-455 http://www.actahort.org/books/913/913_59.htm

through Italy. However, this familiarity with the effect of Psa in Italy does not appear to have translated into Zespri becoming actively engaged in any review of biosecurity settings or of the possible pathways by which the pest might enter New Zealand.

182. Interviews with executives at Zespri indicate that they were aware of the virulence of Psa in Italy for at least two years prior to it being discovered in New Zealand. Zespri notes that it put controls around its Italian orchards to try to limit the spread of the pest within Italy, including attempting to restrict the movement of people, equipment and plant material and putting in place cleaning requirements.¹⁰⁴
183. Zespri acknowledged that up until the Italian outbreak their overwhelming biosecurity concern was preventing the entry of the fruit fly into New Zealand. This changed in 2008 when Psa became a priority for them – and they also began providing advice to orchardists travelling to Italy to take precautions so as to not inadvertently bring the pest back into New Zealand. When asked by MAF in September 2010 to prioritise their pests as part of a post-border incursion co-operation,¹⁰⁵ Zespri ranked Psa as the number one threat to the kiwifruit industry.
184. Zespri was in a unique position: witnessing firsthand the devastation that Psa was having on the Italian kiwifruit industry while also having very strong commercial drivers to ensure that Psa did not enter New Zealand. However, there is little evidence to show that they were actively engaged in ensuring New Zealand's biosecurity regime was as effective as possible. Indeed on 2 November 2010, two MAF employees independently sent internal emails recounting that they had heard that Zespri was forming an industry sub-committee to produce an incursion plan for Psa as there was no planning currently in place.¹⁰⁶
185. Emails sent from Zespri to MAF regarding biosecurity matters prior to September 2010 did not raise concerns regarding the risk that Psa might pose to New Zealand:
 - A Zespri executive emailed MAF in March 2010 noting that concerns had been expressed about the presence of White Peach Scale on fruit imports from Italy (no mention was made of Psa).¹⁰⁷
 - In May 2010 an internal MAF email recounted a phone conference held with Zespri.¹⁰⁸ The email recounted Zespri concern that Plant & Food was undertaking “unexpected and unplanned research activities” to test kiwifruit plant material and imported fruit. According to the MAF email, Zespri were very concerned that, as Plant & Food had a statutory duty to report any organisms they might detect (section 44 of the Biosecurity Act 2003), their

¹⁰⁴ Interview with Zespri staff, 22 March 2012

¹⁰⁵ Note, this was a cross-industry exercise as part of the development of the GIA and not specifically related to concerns about Psa.

¹⁰⁶ Email from MAF staff member on 2 November 2010, 9:33am; and 2 November 2010, 11:20am

¹⁰⁷ Email from Zespri staff member to MAF staff member, 5 March 2010, 8:38am

¹⁰⁸ Email from MAF staff member to Peter Thomson (MAF), 3 May 2010, 1:07pm

research could result in overseas jurisdictions imposing subsequent trade measures on New Zealand exports.

186. When questioned about whether they should have taken greater responsibility for examining existing import requirements and bringing concerns about Psa to policy-makers Zespri executives noted that they were certainly aware of the risks posed by Psa, but had little reason to be very concerned about the risk of it entering New Zealand. They advise that Zespri staff were unaware that pollen imports were taking place so had no reason to be concerned about that particular pathway; were under the impression that any risks with nursery stock would be picked up in quarantine; and that the only concerns they had about Psa entering New Zealand through legitimate imports was through the importation of kiwifruit from Italy.
187. This narrow focus meant that Zespri only engaged with MAF on the risks of Psa transmission via fruit imports – and this only took place from mid-to-late 2010 in the lead-up to potential imports during the off-season (the discussions regarding Psa and fresh fruit are discussed further below).¹⁰⁹ Zespri advises that dialogue began with MAF in July 2010 on the risks of Psa transmission via fruit imports.
188. Zespri has irregular meetings with MAF staff, but prior to the detection of Psa in New Zealand there was limited structured engagement between the industry and MAF on biosecurity risks. Matters such as Psa are typically dealt with on an ad hoc basis when there are changes in circumstances that warrant discussions. There were no meetings between the industry and MAF staff to specifically examine whether biosecurity settings and border processes remained appropriate in light of the risks of Psa until October 2010 – and that was only initiated to discuss the industry’s concerns regarding fruit imports.
189. It is relevant to note that a MAF-industry ‘germplasm working group’ had an initial meeting on 1 March 2010, and GERMAC, a consultative forum between the plant germplasm import industry groups and MAF had an initial meeting on 1 August 2010. These forums were established specifically to formally discuss the management of risks associated with plant germplasm (nursery stock, pollen etc.), but it is not evident that these prompted concerns about Psa to be raised.

A summary of MAF’s initial reaction to the Italian outbreak

190. Regardless of the position one takes on the appropriateness of the relevant IHS at the time they were established, by early-2009 it would have been clear to those on the ground in Italy that there has been a significant development: Psa was affecting gold kiwifruit for the first time; it was now having a significant impact on infected orchards; and it was spreading rapidly through Italy.

¹⁰⁹ Zespri executives noted they did not fully appreciate the implications of the Italian outbreak in order to request a halt to fruit imports in the 2009 off-season.

191. MAF received copies of the EPPO alerts on Psa issued on 1 November 2009 and 1 August 2010. MAF has not indicated the extent to which these were considered or been able to produce any documents/emails that discussed these alerts. Given other documents available and our interviews with MAF staff, it is reasonable to conclude that, although the alerts may well have been examined and been the subject of internal discussions, they did not prompt a reconsideration of the appropriateness of import standards.
192. The earliest internal MAF documents that make reference to the Italian Psa outbreak were in April 2010 in reaction to a media enquiry about what steps MAF was taking to manage any risks to New Zealand from Psa. It is relevant to document the email chains here as they provide a useful insight into the level of familiarity amongst MAF staff of the Italian outbreak:

Email	Relevant Excerpts
<p>8 April 2010, 3.49pm: Email sent from NZPA journalist Kent Atkinson to MAF</p>	<p>“Bacterial canker of kiwifruit caused by <i>Pseudomonas syringae</i> pv. <i>actinidiae</i> has become a serious sproblem [sic] in Hort16A and Jin Tao in Italy during the past season with economic damaged estimated in the millions of euros – NZ grower OPAC yesterday announced it might have to write off its NewGold orchard.</p> <p>Please tell me what MAFBNZ is doing to evaluate the potential risk to New Zealand kiwifruit, both green and gold varieties, particularly in light of the incursion among New Zealand plantings in the Northern Hemisphere.”</p> <p>....</p> <p>“What extra attention does MABNZ (sic) consider should be given to phytosanitary precautions at the border in relation to people, machinery, tools and packaging being brought to NZ from Italian, Japanese and Korean kiwifruit orchards?”</p>
<p>The request was forwarded to a number of MAF staff members for internal comment</p>	
<p>8 April 2010, 4.31pm Internal email from Manager, Fresh Produce</p>	<p>“We require a risk assessment for this. I think Jo has done one for the species but not the strain. As we are importing kiwifruit we may need to focus on the transmission of this disease by fruit.”</p>
<p>8 April 2010, 10.55pm Internal email from Risk Analysis Team</p>	<p>“We have known about this pathovar since at least 2001, and had noted it was important.</p> <p>We issued the kiwifruit fresh produce standard for Italy in 1999, and there are no bacteria on the pest list. However fresh fruit is likely to be a low risk/no risk pathway.</p> <p>Nursery stock is the most likely pathway for entry but has had good controls for many years (level 3 quarantine etc) and this bacteria is on the pest list.</p> <p>However there are no risk analyses supporting any of these</p>

Email	Relevant Excerpts
	standards so

193. On 8 April 2010 an article written by the journalist in question appeared in the Sydney Morning Herald, making it very unlikely that MAF had an opportunity to respond to his same-day enquiry. The newspaper article stated, “A bacterial canker which threatens to financially wipe out a New Zealand-owned gold kiwifruit orchard in Italy may trigger an assessment of the potential risks the disease would pose to orchards in New Zealand.”¹¹⁰
194. The news article was picked up by ProMED-mail,¹¹¹ forwarded to MAF on 16 April 2010 and subsequently re-circulated internally. One staff member responded to the group circulation of the news article, commenting “A possible discussion item for EROC”. A reply to this query stated “Please note this canker is identified as a hazard on Nursery stock pathway and we require specific tests.” The suggestion that EROC should discuss Psa was not taken up. The news article was then added to MAF’s Biosecurity Risk Assessment Database (BRAD) entry for Psa, becoming the first ProMED-mail entry for the bacteria.¹¹²
195. In response to the original media enquiry a MAF staff member produced a two-page summary document of Psa.¹¹³ The summary noted that Psa was present in Japan, South Korea, Italy and China. The paper notes:
- “*P. syringae pv. actinidiae* has been reported affecting buds, leaves, twigs, leaders and trunks [collapse of fruits] (Balestra *et al.* 2009). Serizawa *et al.* (1989) studies the symptomology of the disease. They reported that the bacterium was consistently isolated from the affected tissues (trunks and leaders, canes, leaves, and flower buds). EPPO (2009) states that “infected fruits cannot be totally excluded but seem very unlikely”.
196. The paper then summarised the available literature/views on pathways:

¹¹⁰ Kent Atkinson, ‘Bacterial Canker Hits Kiwifruit in Italy’ Sydney Morning Herald (8 April 2010) <http://news.smh.com.au/breaking-news-business/bacterial-canker-hits-kiwifruit-in-italy-20100408-rsmp.html>

¹¹¹ The Program for Monitoring Emerging Diseases is a global reporting system for emerging diseases and outbreaks.

¹¹² MAF advise that ProMED-mail notifications were only added to BRAD entries from late 2009 or early 2010, so they cannot be sure whether there were ProMED-mail notifications before this date.

¹¹³ We can confidently conclude the summary on Psa was produced in response to the media enquiry. An internal email two months later (15 June 2010) forwarded the original media enquiry and stated “We have had another query from Plant and Food about this canker. I am currently drafting a reply and was wondering if there was any work completed on this in April.” The summary was attached to a response that stated “This is what I did for you in April.” MAF have not produced any internal documents relating to the Italian outbreak that pre-date the media query.

- “EPPO (2009) state trade of infected planting material can spread the disease over long distances
- As a wound-infecting pathogen, it can also be transmitted on orchard equipment such as pruning implements (CPCI 2010)
- Hu *et al.* (1998) considered it to be unlikely that the pathogen is transmitted via seed
- CPCI (2010) does not recommend seed treatments
- MAF Country Freedom report (1999) states “Transmission: Long distance transmission of the bacterium is through infected plant material (less likely on fresh fruit and unlikely on seed). Short distance transmission is through wind blown rain splash, pruning shears and other equipment, and possibly insects (J. M. Young, pers. Comm.)

Fruit transmission: According to CPCI (2010), the pathogen may exist as a resident on the surface of mature fruit, but it is improbable that cells would survive to infect seed or seedlings. EPPO (2009) states that ‘infected fruits cannot be totally excluded but seem very unlikely.’”

MAF’s reaction to the Italian outbreak was inadequate

197. MAF staff noted in interviews that although the Italian outbreak showed a change in the severity of Psa, there were no indications at the time that there had been changes in the means of transmission or in scientific knowledge about the pest. It was asserted that while the outbreak was a cause for concern, there was no ‘trigger’ that might have prompted MAF staff to revisit relevant import requirements.
198. MAF’s official policy of when to initiate a pest risk assessment includes doing so when “an established infestation or an outbreak of a new organism or disease is discovered within an exporting country or area” or when “an organism or disease is reported to be more damaging in an area other than in its area of origin.”¹¹⁴ This policy acknowledges that, even if pathways are assumed to be well managed, a domestic industry nevertheless faces a heightened risk if there is a change in the severity of a pest offshore. A finely balanced decision made years earlier about the content of an import requirement may well be made differently if the pest in question is now likely to have a significantly increased impact on domestic industry. It is for this reason that MAF undertakes pest risk assessments and why it is particularly concerning that this assessment was not formalised in this case.
199. We conclude that MAF should have identified that there had been a marked change in the profile of Psa: unlike its traditional spread, Psa was having a devastating impact on infected kiwifruit orchards, was primarily affecting gold kiwifruit for the first time, and was spreading rapidly throughout Italy. The Italian outbreak meant that the New Zealand kiwifruit industry was faced by a biosecurity threat of an order

¹¹⁴ Biosecurity New Zealand, ‘Risk Analysis Procedures’ Version 1, 12 April 2006, page 33

of magnitude greater than when the relevant import requirements were originally put in place. In light of this information we would expect MAF to have:

- (a) recognised the potential implications from the Italian Psa outbreak;
 - (b) undertaken a pest risk assessment of Psa; and
 - (c) if appropriate, revised the import requirements for certain risk goods.
200. A formal pest risk assessment of Psa never took place prior to the outbreak in New Zealand although, as will be examined below, specific concerns about individual risk goods were examined. By contrast, in May 2010, Biosecurity Australia initiated a review of all relevant import conditions in direct response to the spread of Psa in Italy.¹¹⁵
201. It is also notable that EROC, the committee specifically set up by MAF to undertake environmental scanning for emerging biosecurity risks, never discussed the Italian Psa outbreak or the potential threats posed to the kiwifruit industry.¹¹⁶ Minutes from those meetings show the Committee discussed a number of specific pests (such as *brucellosis* in Tonga, gypsy moth, pig diseases and others) but there was no evidence that Psa was ever discussed.
202. The head of the Risk Analysis Team has stated that the members of her team were certainly aware of the Italian Psa outbreak prior to the detection of Psa in New Zealand, although this did not translate into a formal risk assessment being undertaken. Psa was not flagged as an issue for close scrutiny by her team and she commented that “the assumption at the time was that pathways were already well managed”.¹¹⁷
203. The assumption that the pathways for Psa were as well managed in 2010 as when they were established may be one reason for the lack of documented concern about the Psa outbreak. A lack of documentation does not necessarily mean that MAF staff were unaware or unconcerned about the developments in Italy and there may well have been verbal discussions amongst staff about whether import requirements remained appropriate. But it is reasonable to expect that the emergence of a new virulent strain of Psa would trigger more than an informal verbal assessment of the appropriateness of import requirements. Indeed the first time MAF documented any concerns about the Psa outbreak in Italy was in response to a media enquiry in April 2010 about whether import requirements remained appropriate in light of the risks posed by Psa.

¹¹⁵ Australian Government Department of Agriculture, Fisheries and Forestry, http://www.daff.gov.au/ba/reviews/final-plant/bacterial_canker_of_kiwifruit_pseudomonas_syringae_pv_actinidiae_in_new_zealand/review_of_bacterial_canker_for_kiwifruit

¹¹⁶ EROC met six times from when the EPPO alert was issued in November 2009 through to the detection of Psa in New Zealand in November 2010.

¹¹⁷ Interview with Biosecurity Risk Analysis Manager, 21 March 2010.

204. It also appears that there were several occasions when MAF staff recognised that a closer examination of the risks posed by Psa might be appropriate but no further action was taken (as per the emails reproduced above):
- In response to the journalist’s query as what evaluation had been done of the risks posed by Psa, a MAF staff member emailed internally that “we require a risk assessment for this”.¹¹⁸ The suggested risk assessment was either thought unnecessary or no-one took responsibility for ensuring this occurred.
 - A member of the Risk Analysis Team noted there was no risk analyses supporting any of the import standards and was clearly uncertain whether they remained appropriate in light of Psa.¹¹⁹ These concerns were never followed up.
 - A staff member suggested that Psa should be discussed at EROC.¹²⁰ This suggestion was not followed up.
205. A pest-risk assessment evaluates the likelihood and the biological, environmental, health, and economic consequences of the entry, establishment and exposure of a pest to New Zealand and is an input into considering the appropriateness of import requirements. If undertaken for Psa, this assessment would have likely entailed MAF:¹²¹
- (a) identifying all possible pathways for Psa (including those assumed to be negligible risk);
 - (b) assessing the likelihood of Psa entering New Zealand across all possible pathways (including revisiting the available scientific knowledge on the spread of the pest);
 - (c) assessing the likelihood of Psa exposure and establishment;
 - (d) assessing the consequences of Psa entering New Zealand (including considering the nature and effect on people, the environment, and the economy be considered); and
 - (e) estimating the likelihood, for each possible pathway, that Psa might enter New Zealand and result in adverse consequences.
206. Although MAF revisited what it knew about Psa in April 2010 (by producing the two page summary document on Psa) there is nothing to indicate at that time that Psa was recognised as posing a significant threat to the New Zealand kiwifruit industry. There was no comprehensive examination of all possible pathways for Psa, of the economic consequences should risks not be managed appropriately, of whether scientific evidence had evolved from when the import requirements were initially developed, or whether more rigorous import requirements or border controls were

¹¹⁸ Internal email from Manager, Fresh Produce, 8 April 2010, 4.31pm

¹¹⁹ Internal email from member of Risk Analysis Team, 8 April 2010, 10.55pm

¹²⁰ Internal email from MAF staff member, 16 April 2010, 12:05pm

¹²¹ Biosecurity New Zealand, ‘Risk Analysis Procedures’ Version 1, 12 April 2006, page 42

required.¹²² MAF instead continued to rely on existing import requirements and the task of managing any risk associated with Psa was left to those individuals with responsibility for the relevant import pathways.

207. Although we conclude that MAF's reaction to the Italian outbreak was inadequate, there is also limited evidence that Zespri actively engaged with MAF to identify Psa as a pressing concern. Given Zespri's firsthand experience of the pest in Italy, Zespri should have played a much more active role in ensuring the risks posed by Psa were adequately managed, or even simply at the forefront of the thoughts of MAF's Risk Managers. Instead Zespri appears to have made a number of optimistic assumptions about the protection afforded by New Zealand's biosecurity regime.
208. While there are concerns with the manner in which MAF reacted to the emergence of a virulent strain of Psa, we need to acknowledge the difficulty in trying to appreciate the considerations and competing priorities that might have been influencing individuals in MAF at that time. The relevant staff making decisions about emerging risks do not specialise in the kiwifruit industry and each have responsibilities ranging across a large number of sectors and risk goods.
209. Assessing emerging risks is a complex task and when MAF is not being urged by industry to urgently review import requirements, it may be somewhat understandable if a matter is not given the priority it may otherwise receive. Our assessment that MAF's response to the Italian outbreak was inadequate is a reflection of the failings with the biosecurity system rather than of any individuals within MAF.

Concerns were expressed about whether the import requirements remained appropriate

210. On 17 May 2010 a Senior Scientist at Plant & Food emailed the MAF Plant Imports Team:¹²³

“New Zealand are currently importing Italian kiwifruit from Latina, Italy, one of the centres of the epidemic. The packing house is in another district, but the kiwifruit are grown in the place where the epidemic is severe. Do you think the import risk assessment should be re-examined?”

211. On 25 June 2010 the MAF Manager of Fresh Produce Imports responded, noting that MAF had investigated the presence of Psa in Italy and the available science

¹²² For example, even if the pest-risk assessment deemed the import requirements to be appropriate, it might have identified the need for border controls to be tightened with respect to individuals entering New Zealand after visiting Italian kiwifruit orchards.

¹²³ Email from Plant & Food, 17 May 2010, 3:55pm. The email included a link to the EPPO alert on Psa and the NZPA article written by Kent Atkinson. This is the query from Plant & Food that subsequently prompted a MAF employee on 15 June 2010 to ask whether MAF had done any work in April 2010 in response to the media enquiry. The two page summary produced in April 2010 was then used as the basis for the MAF response to Plant & Food of 25 June 2010.

indicated the risk of Psa exposure through the importation of green kiwifruit for consumption was “very unlikely”.¹²⁴ The letter stated:

“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”

212. In an interview for this report a Senior Scientist at Plant & Food, noted that he was working in Italy researching the Psa outbreak. He stated that Plant & Food was “not satisfied” with MAF’s response to their concerns, which he interpreted as requiring substantial new information on the risks with pathways before they would alter the biosecurity status quo. The scientist claimed that by 2009 it was readily apparent to him that the Psa outbreak was on a much greater scale than any other outbreak and Plant & Food accordingly began looking in detail at how the bacteria was spreading through Italy and the implications for entry to New Zealand.
213. On 20 August 2010, Peter Landon-Lane, the Chief Executive Officer of Plant & Food, wrote a letter to his counterpart at MAF, Murray Sherwin, Director-General. The letter noted the earlier correspondence between Plant & Food and MAF and MAF’s position that it would require further published evidence on the transmission of Psa via imported fruit before it would consider additional phytosanitary measures. Mr Landon-Lane wrote:
- “Due to concern about the possible introduction of *Pseudomonas syringae* pv. *actinidiae* into New Zealand via imports of Green Kiwifruit from Italy, and the potential impact that this could have on New Zealand’s kiwifruit industry, we have initiated research to establish whether *Pseudomonas syringae* pv. *actinidiae* can survive treatment under the current protocol in place for imports into New Zealand of Green Kiwifruit from Italy.”
214. It was noted that Plant & Food expected to complete this research and have the results reviewed by the end of September.¹²⁵

¹²⁴ Letter from MAF Manager, Fresh Produce, to Plant & Food, 25 June 2010. The letter cited the EPPO alert of 2009 (which noted that although the possibility of transmission via fruit cannot be excluded it is considered “very unlikely”) and CPCI entry of 2010 (that concluded that although Psa may be present on the surface of mature fruit it is “improbable” that the cells would survive to infect seeds or seedlings)

¹²⁵ Note, MAF was aware that Plant & Food would be undertaking this research prior to the letter being sent to the Director-General. The Group Manager, Plant Imports and Exports, noted in an email exchange with Plant & Food regarding this research that “If information arrives that requires urgent action please contact...” (email from MAF staff member, 17 August 2010, 2:06pm).

Plant & Food research indicated possible vulnerabilities to Psa from imports of certain risk goods

215. Towards the end of September 2010 Plant & Food began to identify some preliminary findings from their research into whether viable Psa would survive the current treatment protocol in place for imports for fruit. Appendix 7 contains relevant excerpts from subsequent emails between MAF, Plant & Food, Zespri, Italian authorities, and Ministerial staff, which provide a very useful insight into perception of the risk of Psa at that time.
216. Although Plant & Food's research was initially only going to examine whether Psa could be transmitted through the importation of mature fruit, a Senior Scientist from Plant & Food was asked by Zespri on 29 September 2010 to "provide a definitive position on the risks of Psa on fruit, graft wood, pollen" and to treat the matter as a priority. The scientist responded that same day, sending the following to Zespri (which was forwarded to MAF the following day):¹²⁶

"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 [sic] 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."

217. By 30 September 2010 MAF was therefore in receipt of a scientific opinion stating a "definitive position" that pollen and nursery stock from areas infected with Psa should not be imported into New Zealand, with a "strong opinion" that fruit from infected areas also posed a biosecurity risk as the regime in place would not kill any Psa present. It is important to note that these initial findings are qualified by the

¹²⁶ Email from Senior Scientist (Plant & Food) to Zespri staff (29 September 2010, 1:58pm) (emphasis added).

statement that research had not been undertaken on whether the presence of Psa on these imported products might lead to transmission. Yet the clear tone of the Senior Scientists email is that pollen and nursery stock imports should not be permitted until more is known about the likelihood of transmission, while the treatment regime for fruit is inadequate.

Comment on the interaction between MAF and Plant & Food

218. The specific concerns raised by Plant & Food about the possible pathways for Psa into New Zealand, and MAF's reaction to them, are addressed in the sections of this paper that follow. However, there are issues arising from this research that first require reflection.

MAF was correct in requiring additional evidence prior to taking action with fruit imports

219. MAF quite rightly concluded in June 2010 that there was insufficient evidence regarding the risks of Psa transmission via fruit imports to justify any new phytosanitary measures. While the requirement to have published evidence overstated the degree of evidence needed to impose phytosanitary measures, at that point in time they were not in possession of any evidence that could be used to change the import requirements for fruit.

Plant & Food took the lead in examining the biosecurity threat posed by Psa

220. The exchange between MAF and Plant & Food on this issue provides an interesting insight into the working relationship between the two organisations. MAF's response in June 2010 to Plant & Food's concern about fruit imports, while appropriate, had an element of finality to it, with MAF advising "an additional review is an option if further literature becomes available."¹²⁷ MAF's position was effectively that, until such time as there was further evidence, it would not be considering the matter further. We note that MAF did request Plant & Food to inform them if any information emerged requiring urgent action and, as will be examined below, acted promptly on receipt of the preliminary findings from the Plant & Food Senior Scientist to address scientific uncertainty around fruit imports.
221. Plant & Food was clearly of the view that there was an evidence gap as to whether kiwifruit imports might be a vector for Psa and that MAF's approach was not precautionary enough in light of the potential impact of Psa on the industry. This is evidenced by the unusual step of the Chief Executive of Plant & Food writing to the Director-General of MAF.
222. The contrast between the perspectives of the two organisations is clear. MAF viewed the published literature on bacteria-transmission via fruit as insufficient to

¹²⁷ Letter from MAF Manager, Fresh Produce, to Plant & Food, 25 June 2010.

legally justify phytosanitary measures; whereas Plant & Food saw the same literature as not ruling out the possibility that fruit might transmit Psa and thereby necessitating urgent scientific research.

223. MAF advises that it is certainly not unusual for organisations to investigate areas of possible biosecurity concern and to then bring their concerns to MAF. It was noted that MAF's role is to apply the law on the basis of the evidence that is available and that MAF simply does not have the resources to fund or proactively research all possible pathways for all possible pests. MAF is therefore very dependent on accessing the research undertaken by others – as it did in this case from Plant & Food.
224. It is commendable that Plant & Food recognised the risk that the virulent strain of Psa posed to the kiwifruit industry in New Zealand and then proactively undertook research to ensure the biosecurity regime was based on accurate scientific information.

MAF's response to concerns about import requirements was lacking

225. The available information shows that Psa was on MAF's radar in the second half of 2010; however, this was largely as a reaction to the concerns expressed by other parties (including Plant & Food, Zespri and the relevant Minister). What followed was a reactive and fragmented assessment of the risks of Psa in response to specific concerns expressed about individual pathways. There is little evidence of MAF leadership across these responses, of co-ordinated analysis and engagement with industry, or of any concerted effort to assess the strategic threat Psa posed to the New Zealand industry.
226. While it might well have been too late for MAF to take action from mid-to-late 2010 in order to prevent the Psa outbreak in October 2010, how MAF reacted to developments over that period provides a very useful insight into the extent to which there were issues with the relevant import requirements, the processes by which MAF monitors changes in scientific knowledge and offshore markets, and the level of urgency that MAF attributed to the threat of Psa.

MAF's response to concerns with fruit imports was well managed and appropriate

227. Most of the effort in 2010 by both MAF and industry on identifying New Zealand's potential exposure to Psa focused on the risk posed by imported fruit from Italy.
228. MAF acted very promptly and entirely appropriately once it received preliminary scientific findings highlighting the potential for Psa to be associated with kiwifruit imports. MAF staff quickly recognised the potential significance of the findings, which called into question established scientific views on the risks with fruit imports. Staff promptly engaged with the researchers to seek further clarification, informed trading partners that research was being undertaken, sought legal advice on their ability to impose temporary trading measures, hosted an industry meeting where a

voluntary moratorium on imports of fruit from Italy was agreed, and established a workplan to resolve whether the issue of whether kiwifruit imports could transmit Psa.

A summary of MAF's reaction to concerns with fruit imports

229. As noted above, MAF received an email from Plant & Food on 30 September 2010 stating that, if Psa is present on the surface of fruit (which it suspects would occur), then the temperature controls put in place for kiwifruit imports would not kill any Psa present. Plant & Food concluded that imports of such fruit “do pose a biosecurity risk”, but acknowledged that they had not undertaken testing to examine whether infected fruit-for-consumption could lead to infection of vines.¹²⁸
230. It is reasonable to expect that the receipt of this scientific information would be treated as a priority by MAF, with processes being initiated to examine whether the existing phytosanitary measures remained appropriate. The emails that were prompted by these findings are summarised in Appendix 7.
231. The MAF Manager of Fresh Produce Imports responded to Plant & Food on the same day she was informed of the preliminary findings, noting that “we may need to make sure that there is a pathway for the Psa on the surface of the fruit to infect the host”.¹²⁹ The email noted that “as this could be very close to FB [fireblight] in apples” MAF would need some additional questions answered. These included how fruit might be contaminated by Psa, whether Psa populations could be sustained on an inert surface, what disinfection techniques are used in packing houses, what the effects are of changes in temperature on Psa viability, and whether there is a genuine transmission mechanism from discarded fruit to a susceptible host.
232. Interviews with MAF staff have made clear that they were very conscious of the argument that New Zealand was putting to the WTO regarding Australia's refusal to allow the import of New Zealand apples.¹³⁰ That argument was that Australia had failed to demonstrate that the import of mature symptomless apples from orchards infected with fireblight would lead to infections of apple orchards. The staff members noted that the mere ‘possibility’ of Psa being introduced via the import of fresh kiwifruit was not sufficient to impose new phytosanitary measures on fruit imports.
233. MAF formally wrote to the Italian authorities the day after being informed of Plant & Food's concerns.¹³¹ The letter advised that research was being undertaken on Psa; that the initial findings indicated that fruit may be a carrier of Psa; and that MAF would be in contact by the end of October to inform them of the conclusions of the research and the implications for the import of Italian kiwifruit.

¹²⁸ Email from Senior Scientist (Plant & Food) to Zespri staff (29 September 2010, 1:58pm)

¹²⁹ Email from Manager, Fresh Produce, 30 September 2010, 1:30pm

¹³⁰ On 9 August 2010 WTO Disputes Panel circulated their ruling and on 29 November 2010 the Appellate Body ruling was circulated – both of which upheld New Zealand's challenge to Australia's phytosanitary measures regarding the possible transmission of fireblight from mature apple imports.

¹³¹ Email from MAF staff member 1 October 2010, 1:12pm

234. By 7 October 2010 there had been an exchange of emails between MAF and Zespri. In response to a Zespri request that all imports of Italian kiwifruit be halted pending further assessment of the risks posed by Psa,¹³² MAF stated that they would not impose phytosanitary measures on Italian kiwifruit imports until they had received the final report from Plant & Food.¹³³
235. On 22 October 2010 MAF organised a workshop with Plant & Food, Zespri and the Fresh Produce Importers Association to discuss the situation with respect to imports of kiwifruit from Italy. The outcome of this meeting was an agreement to form a working group with representations from all organisations present. The group would focus on:¹³⁴
- (a) conducting a preliminary trial on the level of Psa on fruit;
 - (b) providing guidance on research on the transmission of Psa from fruit to a susceptible host (to be undertaken jointly by Plant & Food and MAF);
 - (c) developing a contingency plan to respond to the outcome of the research; and
 - (d) co-ordinating communication with external stakeholders and trading partners.
236. After being forwarded an email from the Minister's Private Secretary noting the outcome of the workshop, the Group Manager - Pest Management at MAF sent a group email to seven MAF staff stating:¹³⁵
- “This email is intended as a backstop - to make sure we have connected the dots (which knowing the people involved I anticipate we have):
- Kiwifruit industry sub-committee being formed to formulate a response plan to an incursion of PSA
 - GIA interest in joint response preparedness [sic] with industry
 - MAF-led research on potential risks associated with PSA to NZ kiwifruit industry”.
237. The working group never met as the Psa outbreak was reported to MAF on 5 November 2010.

MAF acted promptly in seeking information on Psa transmission via fruit

238. MAF's prompt reaction to the potential association between Psa and fruit indicated awareness of the significance of the finding and the implications for the New Zealand kiwifruit industry. On the same day it received the preliminary findings MAF contacted Plant & Food to ensure that the final research conclusions would

¹³² Email from Zespri staff member, 5 October 2010, 6:05pm

¹³³ Email from Manager, Fresh Produce, 7 October 2010, 3:47pm

¹³⁴ Email from Manager, Fresh Produce, to participants at the workshop, 1 November 2010, 11:04 am

¹³⁵ Email from Group Manager – Pest Management, 2 November 2010, 10:03am

examine all the issues MAF would need if it was to impose any new phytosanitary measures. The letter sent by MAF to their Italian counterparts the following day also indicated a willingness to impose new phytosanitary measures if the evidence supported such a step. Similarly, MAF quickly facilitated a meeting with industry stakeholders to agree a workplan for resolving the question of whether imported kiwifruit could transmit Psa.

MAF considered temporary import measures for kiwifruit imports

239. By 1 October 2010 there was awareness amongst MAF staff that the current treatment of kiwifruit would not kill any Psa bacteria that might be present, as well as genuine uncertainty as to whether fresh kiwifruit imports could transmit Psa.¹³⁶ As noted earlier, the SPS specifically empowers governments to impose temporary phytosanitary measure in cases where “relevant scientific evidence is insufficient” and further information needs to be obtained.¹³⁷
240. Given the level of uncertainty that MAF was presented with and the potential for Psa to devastate an economically significant industry, it is reassuring that MAF specifically considered whether a case could be made for taking temporary trade measures under the SPS. A MAF draft Decision Document dated 26 October 2010 examined the Plant & Food research regarding fruit and concluded that the findings were not were not sufficient to impose any temporary measures on kiwifruit imports from Italy.¹³⁸ In this case there was no new information on whether Psa would actually be present on mature fruit (the research examined what would happen if Psa was already present) and no new evidence as to how Psa cells might be transmitted from the fruit to a kiwifruit plant.

A voluntary ban on Italian kiwifruit imports was instituted to minimise the risk posed by Psa

241. MAF advises that it was very mindful at the time that if it were to ban imports of fruit from Psa-infected regions then there would be very severe economic repercussions for the domestic industry if Psa ever did enter New Zealand. While the Plant & Food research may not have provided clear evidence to show that fruit imports could transmit Psa there was a degree of uncertainty, which is why MAF and industry formed a working group to examine the matter further.
242. Both Zespri and MAF agree that the initial meeting of 22 October 2010 discussed the possibility of MAF imposing temporary trade measures on Italian kiwifruit. There was unanimous agreement from those present that it would be counterproductive to do so and that a more appropriate route would be for

¹³⁶ As evidenced by their letter warning Italian authorities about the possibility of phytosanitary measures being imposed within the month and their request to Plant & Food to ensure the research covered all key aspects needed to justify phytosanitary measures.

¹³⁷ Article 2.2(7) of the SPS

¹³⁸ Draft Decision Document ‘Plant and Food Report on Kiwifruit Canker (26 October 2010). The draft Decision Document was finalised due to the outbreak of Psa in New Zealand shortly afterwards.

importers to institute a voluntary ban on imports until such time as the scientific research was completed.

243. The 'Kiwiflier' produced on 2 November 2010 records Zespri's subsequent message to the industry: "Until the risk is scientifically assessed by MAF, we'll be insisting that no Italian kiwifruit enters New Zealand as we believe that is in the best interests of the New Zealand kiwifruit industry."¹³⁹

There may have been an erroneous impression at senior levels that MAF was systematically examining the threat of Psa

244. The email sent by the Group Manager - Pest Management to MAF staff on 2 November 2010 (referenced above at paragraph 236) was intended "to make sure we have connected the dots."¹⁴⁰ He summarised the activity he was aware of regarding Psa and noted his impression there was "MAF-led research on potential risks associated with PSA to NZ kiwifruit industry". This impression was incorrect. The research being undertaken was not examining the risks associated with Psa, but rather the much narrower issue of the risks of Psa entering New Zealand through imported fruit.
245. The Manager of Fresh Produce Imports responded, stating that a working group had also been formed to examine the risks associated with imports of kiwifruit.¹⁴¹ However, no one corrected the initial statement or identified that MAF's assessment of the risks of Psa in light of the Italian outbreak was actually limited to the one pathway: fruit. There may therefore have been an impression at senior levels that MAF had a project underway to examine the extent to which Psa posed a potential biosecurity risk across all possible pathways.

MAF's response to concerns with pollen imports was sub-standard

246. Irrespective of our earlier finding that the import requirements for kiwifruit pollen imports were inadequate, we conclude that MAF did not respond appropriately to a number of triggers in 2010 that should have prompted a halt to pollen imports.
247. MAF's response to a finding that live Psa had been detected on pollen was sub-standard. It was the culmination of a series of events that had meant that MAF was not monitoring the extent to which pollen might be a vector for Psa. The receipt of information that Psa had been detected on pollen from Psa-infected orchards should have been sufficient to immediately revoke all import permits for pollen and to initiate procedures to track the consignments that had already entered the country.
248. Information was available that, if collated, would have been sufficient to halt kiwifruit pollen imports into New Zealand from May 2010, at least five months prior

¹³⁹ 'Kiwiflier' excerpt sent by Zespri to MAF staff, the Minister's Private Secretary and Ministerial Advisor, 2 November 2010, 8:54am

¹⁴⁰ Email from Group Manager – Pest Management, 2 November 2010, 10:03am. Reproduced in Appendix 7

¹⁴¹ Email from Manager, Fresh Produce, 2 November 2010, 11:20am

to the outbreak of Psa. Although there is no evidence of MAF taking deliberate action to halt pollen imports, it is relevant to note that only one import of pollen occurred past this date and the Tracing Report notes the entire consignment was accounted for following the Psa-outbreak. Nevertheless, an opportunity was missed in 2010 to trace whether previous imports of pollen had exposed the industry to risks of Psa.

A summary of MAF's reaction to concerns with pollen imports

249. As noted above, on 30 September 2010 MAF received an email from a Plant & Food Senior Scientist stating: "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 [sic] New Zealand for pollination purposes."

250. On 11 October 2010 a MAF staff member had a phone call with another Plant & Food employee to discuss separate concerns Plant & Food had about whether the testing regime would detect Psa on plants being released from quarantine (these concerns are examined later in this paper). When relaying these concerns to senior MAF staff she also noted:¹⁴²

"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 Initial information from Plant & Food suggests that *Pseudomonas syringae* pv *actinidiae* may be pollen transmitted. If this is the case we may need to review the import requirements for Actinidia pollen."

251. Apart from the above email that restated the Plant & Food finding and noted the possibility of reviewing pollen import requirements, there is no documented evidence that the Plant & Food conclusions were considered further by MAF or that any action was taken to revisit pollen import requirements.

The detection of live Psa on pollen required an immediate response

252. MAF has been unable to produce any internal emails or documentation to demonstrate that it recognised the scientific uncertainty around pollen at any stage prior to the outbreak of Psa in New Zealand. We cannot rule out that there were verbal discussions amongst MAF staff about how to respond to the finding that live pollen had been detected on pollen.

253. The 2007 scientific paper that was the original basis for allowing the import of kiwifruit pollen stated that "there are no pollen-transmitted bacteria".¹⁴³ This view was expanded on when MAF staff that approved the first import permit for pollen were advised, "As you will see there are no pests or diseases known to be associated with pollen of Actinidia spp."¹⁴⁴ Plant & Food's finding that live Psa had been

¹⁴² Email from MAF staff member, 11 October 2010, 12:02pm

¹⁴³ S D Card, M N Pearson, G R G Clover. (2007) 'Plant pathogens transmitted by pollen', *Australasian Plant Pathology* 36, 455-461

¹⁴⁴ Email from MAF staff member, 6 December 2006, 6:07pm

detected on pollen was a significant new development and contradicted the previous scientific advice that there were no pests associated with kiwifruit pollen.

254. While the Plant & Food Senior Scientist qualified his finding that Psa could be detected on pollen by noting he had not yet had the opportunity to examine whether pollen could transmit the bacteria, the association between pollen and Psa should have triggered an immediate response – the cancellation of all pollen import permits and a response plan to identify where imported consignments of kiwifruit pollen had been used in New Zealand. Indeed following the New Zealand outbreak of Psa the mere association between pollen and Psa was deemed by MAF to be sufficient evidence to cancel all import permits for kiwifruit pollen.¹⁴⁵ Yet for whatever reason, this step was not taken in October 2010.
255. One of the authors of the 2007 scientific paper on the risks associated with pollen acknowledged in an interview that if he had appreciated that kiwifruit pollen could harbour Psa he would have changed his opinion that there were no pests known to be associated with kiwifruit pollen.¹⁴⁶ He noted that the presence of Psa meant Psa-transmission via pollen could not be ruled out. He also commented that, just as important as knowing that Psa-transmission via pollen could not be ruled out, was the fact that the imported pollen was intended for widespread artificial pollination (meaning that the risks were not confined) and the devastating impact Psa was having offshore from 2008 onwards.

MAF did not revisit whether pollen could be a vector for Psa

256. Interviews with MAF staff have indicated that, following the publication of the 2007 research paper, pollen was not on their radar as a potential pathway for bacterial pests. The comment was made that from 2007 until the outbreak of Psa in New Zealand pollen was considered to be a very unlikely pathway for Psa.¹⁴⁷
257. MAF staff commented that they typically operate in an environment of scientific uncertainty and that it was relatively unusual to have a scientific paper (the 2007 paper examining pollen) specifically concluding there was no risk with a particular pathway. The MAF Manager, Plant Imports & Exports noted in an interview that having an academic paper that discounted the possibility of pollen-transmission of bacteria made decisions to approve import permits for pollen “relatively easy”.¹⁴⁸ Indeed the comment that approving pollen imports was “business as usual” is borne out when one considers that, of the nine instances where MAF has copies of the import permit applications for pollen, three applications were approved on the same

¹⁴⁵ An internal MAF draft Decision Document dated 25 August 2011 notes that the existence of scientific uncertainty about the risks posed by pollen is sufficient to halt imports: “A precautionary approach is recommended for commercially prepared pollen, assuming there is sufficient uncertainty to suggest this could be a pathway for the entry of new haplotypes of Psa in Chile and China entering and establishing in New Zealand”.

¹⁴⁶ Interview with MAF staff member, 9 March 2012

¹⁴⁷ Interview with MAF staff member, 21 March 2012

¹⁴⁸ Interview with Manager, Plant Imports & Exports, 21 March 2012

day as the application was made and a further four were approved by the following day.

258. The lack of concern about whether pollen could be a pathway for Psa also meant that no-one at MAF was monitoring developments regarding pollen. The Manager of the Risk Analysis Team at MAF that is responsible for monitoring developments in scientific knowledge and offshore markets advised that no-one in her team was aware that pollen imports were even taking place.¹⁴⁹ Available emails make clear that the Risk Analysis Team was consulted in 2007 regarding both the scientific paper on pollen and the issuance of the first kiwifruit pollen import permit¹⁵⁰ – so it is concerning that by the time of the Psa outbreak in 2009/10 that, for whatever reason, the Risk Analysis Team no longer had a complete picture of all pathways.

MAF failed to identify that Australia required Psa-testing of pollen

259. By 2010 Australia was only permitting imports of kiwifruit pollen of New Zealand origin and, despite Psa not having been detected in New Zealand, all such imports had to be tested and certified as being free from Psa.¹⁵¹ Imports of pollen to Australia were subsequently halted following the detection of Psa in New Zealand and are now only permitted from areas that are certified as being free from the pest.
260. There are three aspects of Australia's import requirements for pollen that raise concerns about MAF's handling of pollen imports and the extent to which it was monitoring developments offshore:
- (a) The Australian biosecurity agency (the Australian Quarantine and Inspection Service) either recognised the potential for pollen to transmit Psa or adopted a precautionary approach by favouring import requirements that would limit the risk of Psa entering the country. This approach contrasts with the position of MAF.
 - (b) There is no evidence that MAF recognised that Australia had changed its import requirements for pollen. Kiwi Pollen, advised that they had been exporting New Zealand pollen to Australia for ten years and that the requirement to test New Zealand exports for Psa was adopted following the outbreak of Psa in Italy.¹⁵² MAF advise they were not informed of this change to import requirements by Australia as it was implemented through a change in individual import permits rather than the generic import requirements for pollen.

¹⁴⁹ Interview with Biosecurity Risk Analysis Manager, 21 March 2012. This is supported by the fact that an email from the Risk Analysis Team member on 8 April 2010, 10.55pm (reproduced above at paragraph 192) summarised the biosecurity measures in place across possible pathways but failed to mention pollen imports as a theoretical pathway.

¹⁵⁰ See paragraph 114

¹⁵¹ See http://www.daff.gov.au/_data/assets/pdf_file/0004/2047810/Final_PSA_PRA_281011.pdf, section 1.2.3.

¹⁵² Interview with Kiwi Pollen, 22 March 2012

- (c) As the testing of pollen for Psa had to be certified on the Phytosanitary Certificate that accompanied the exports to Australia, MAF was the organisation that was actually responsible for certifying that the relevant New Zealand pollen consignments had been tested for Psa. There is no evidence that this detailed awareness of Australia's import conditions was fed back to the Standards Team at MAF.

Plant & Food was unaware pollen imports might be taking place so did not immediately inform MAF that Psa could be detected on pollen

261. Although MAF was informed on 30 September 2010 that Plant & Food had detected live Psa on pollen samples, this finding had actually been made over four months previously.
262. The Plant & Food Senior Scientist responded to Zespri within two hours of being asked for his scientific opinion on the risks of Psa on pollen (his conclusions were forwarded to MAF the following day, 30 September 2010). He stated in an interview that he was able to provide this advice so quickly because he had been aware since May 2010 that viable Psa could be detected on pollen sourced from infected orchards.¹⁵³ He stated that he informed Plant & Food colleagues and Zespri contacts of this finding at the time, but he did not consider contacting MAF as it did not cross his mind that kiwifruit pollen imports into New Zealand might be taking place. He claims the first time he was aware that commercial pollen imports to New Zealand were taking place was when it was mentioned at the MAF workshop on 22 October 2010 held to discuss the risks of Psa from fruit imports.
263. Although Plant & Food had been importing pollen from March 2010, it was for research purposes only. The Plant & Food pollen import permits required their imported pollen to be kept in a controlled environment and incinerated after analysis – factors that mean it was quite reasonable for Plant & Food to conclude that any pollen entering the country might also be handled in a similar manner, as opposed to widespread commercial use.
264. A situation therefore existed by May 2010 where three separate groups across MAF and Plant & Food independently knew one of the following facts:
- (a) that live Psa could be detected in pollen from infected orchards (Plant & Food);¹⁵⁴
 - (b) that Psa was in present in China (and other countries) (MAF Risk Analysis);¹⁵⁵ and

¹⁵³ The finding by the Plant & Food Senior Scientist with respect to live Psa being detected on pollen was made with respect to vacuum-collected pollen from infected orchards in Italy. He did not examine whether Psa cells would survive the milling process or whether the pollen could transmit Psa to kiwifruit plants.

¹⁵⁴ Interview with Senior Scientist, Plant & Food, 30 March 2012

¹⁵⁵ As noted in the two-page summary on Psa produced in response to the media query in April 2010 on the risks of Psa (summarised above in paragraphs 195 and 196)

- (c) that pollen imports from China (and other countries) were taking place for the purpose of artificially pollinating orchards (MAF Plant Imports).¹⁵⁶
265. While knowledge of any one of these three pieces of information may not be alarming in and of itself, putting all three pieces together would be expected to give rise to immediate concern. If there had been a coherent view of this information at any stage from May 2010 onwards then it is probable that pollen imports would have been halted and processes put in train to identify where any imported pollen had been used. This obviously did not occur and on 18 June 2010 a 1kg consignment of pollen from China was given biosecurity clearance¹⁵⁷ (the MAF Tracing Report notes that following the outbreak of Psa in New Zealand this entire consignment was subsequently surrendered to MAF and that the pollen, which tested positive for Psa, was never used in New Zealand).¹⁵⁸
266. It is also relevant to note that the finding that live Psa could be detected in pollen was published in a scientific paper that was presented as the keynote speech for the pathology session at the 7th International Symposium on Kiwifruit in Italy on 15 September 2010.¹⁵⁹ An abstract of the paper presented at the symposium was forwarded to MAF by the Italian Authority on 14 October 2010, although the abstract did not note the link between pollen and Psa.¹⁶⁰

Concerns regarding pollen were sent to the most appropriate staff members at MAF, but all failed to act on it

267. Within a day of Plant & Food emailing their preliminary findings regarding pollen to MAF at least four senior MAF staff members with a broad range of responsibilities had received a copy of the conclusions.¹⁶¹ Included within this list of recipients was the Manager whose teams were responsible for Nursery Stock IHS (under which pollen was imported) and approving the applications by import permits for pollen, as well as the author of the 2007 scientific paper that had stated that there were no pests known to be associated with kiwifruit pollen.
268. The recipients of this scientific evidence were the most relevant staff members at MAF to receive and process this information and take appropriate action. None of

¹⁵⁶ Under Permit 2009036858 Kiwi Pollen was allowed to import pollen from China from 30 April 2009 to 30 April 2010. This was replaced by Permit 2010040083, which allowed Kiwi Pollen to import pollen from China from 9 June 2010 to 9 June 2011 (subsequently revoked).

¹⁵⁷ BACC c2010/161762. This was the only consignment of pollen from China that entered the country from May 2010 onwards.

¹⁵⁸ MAF Tracing Report, page 17.

¹⁵⁹ J.L. Vanneste, C. Kay, R. Onorato, J. Yu, D.A. Cornish, F. Spinelli, S. Max, 'Recent Advances in the Characterisation and Control of *Pseudomonas syringae* pv. *actinidiae*, the Causal Agent of Bacterial Canker on Kiwifruit'

¹⁶⁰ Email from Antoniacci Loredana (Region Emilia-Romagna) to Manager, Fresh Produce, 14 October 2010, 10:16pm

¹⁶¹ Including the Manager, Plant Imports & Exports; the Team Manager, Fresh Produce; the Director, Investigation & Diagnostic Centres & Response; and the Manager, Plant Health & Environment Laboratory (and co-author of the 2007 scientific paper on the pest-transmission of pollen)

the MAF recipients appeared to recognise the significance of the finding regarding pollen, with no internal documentation/emails being produced.

269. As was examined above, the Plant & Food findings generated considerable activity with respect to fruit imports. It is our view that by this point in time MAF was of the view that the greatest risk of Psa entering New Zealand through legitimate imports was through kiwifruit: pollen was not on the radar while nursery stock quarantine conditions were considered largely appropriate for preventing the entry of Psa through that pathway.
270. The Manager of Fresh Produce Imports was a recipient of the email and immediately responded to the findings by quite naturally focusing on the subject matter for which she was responsible: kiwifruit imports¹⁶² (and as noted above, the response regarding fruit was very well handled). It may be that others assumed her subsequent actions meant that she was taking the lead in making sure that the Plant & Food findings were being addressed. In this case it appears that the finding with respect to pollen was not prioritised.

Zespri also failed to recognise the significance of the concerns with pollen

271. Zespri received Plant & Food's findings regarding the risks of Psa entering New Zealand via pollen, nursery stock and fruit, but only requested that MAF act to restrict imports of kiwifruit.¹⁶³
272. Zespri executives have asserted that the reason the industry never raised concerns about pollen imports was because no-one knew such imports were taking place. Zespri claimed that if they were aware of pollen imports they would have acted immediately to have them "shut down" - as the pathway to domestic orchards was too clear and the relative financial benefits of allowing such imports was dwarfed by any possible risk to the New Zealand kiwifruit industry.
273. It is reasonable to conclude that there was no widespread industry knowledge that pollen imports were taking place based on the fact that there was never any public consultation on the relevant IHS, there was no notification that import permits had been approved, and that industry executives would not have known about the individual consignments arriving in the country. There may well have been some degree of local grower knowledge, but there is no evidence this awareness permeated to a senior level in the industry.
274. We note however, that on 29 September 2010 the Zespri Global Supply Manager emailed Plant & Food asking "Could you please make it a priority to come back to us by the end of the week with a definitive position on the risks of Psa on fruit; graft wood; *pollen*. (emphasis added)"¹⁶⁴ The Zespri staff member who sent that email

¹⁶² On receipt of the findings regarding pollen, nursery stock, and kiwifruit, the Manager, Fresh Produce Imports immediately responded requesting the researchers examine six key questions with respect to the risk of Psa transmission via fruit (email of 30 September 2010, 1:30pm)

¹⁶³ Email Zespri staff member, 5 October 2010, 6:05pm

¹⁶⁴ Email from Zespri staff member to Plant & Food, 29 September 2010, 12:41pm

noted in an interview that he was certainly not aware that pollen imports were taking place and had not even considered the possibility that such imports might be taking place.¹⁶⁵ The enquiry to Plant & Food was described as a “reasonably generic question about the risk of Psa coming into New Zealand” and reflected nothing more than his awareness that research had been done in Italy looking at whether Psa movement could occur across budwood, fruit, and pollen.

275. Regardless of whether Zespri was aware pollen imports were taking place, Zespri should have done more once informed of the “definitive position” of a Plant & Food scientist that pollen posed a biosecurity risk and should not be imported. At a minimum it would be reasonable to expect Zespri to make enquiries with MAF as to whether all possible pathways for Psa were covered and, if it believed that imports of pollen were not taking place, to simply double-check that there had been no pollen imports. Zespri have commented that, by forwarding the scientist’s conclusions to MAF, they felt they were bringing the matter to MAF’s attention – and note that at this point MAF still did not alert them that imports of pollen were taking place.

MAF’s response to concerns with nursery stock imports was not sufficiently proactive

276. The import requirements for nursery stock did not differentiate between imports of plant material from areas free of Psa and imports from areas (or even orchards) known to be infected with Psa. Complete reliance was instead placed on being able to detect any Psa-infected plants during the minimum six month period they were in PEQ.
277. As was noted in the preceding chapter, such an approach was perfectly reasonable during the period 2004-2009, when Psa was considered a low-risk pest. However, the appropriateness of this approach should have been revisited in 2009/10. Had MAF initiated a review of its import procedures in light of the Italian Psa outbreak it might have learned that there were serious deficiencies with the testing regime in place to detect Psa. MAF reacted promptly when it was made aware of these concerns in October 2010, but it missed an opportunity to rectify this problem many months previously.
278. Although MAF took immediate steps to improve the reliability of Psa testing for those plants that were still in quarantine; in a major omission, no-one identified the need to track-down the plants that had previously been given clearance under tests that would not have reliably detected any Psa present.

¹⁶⁵ Interview with Zespri staff member, 12 April 2012

MAF was conscious that nursery stock could be a vector for Psa

279. On 17 August 2010 the Acting Director Investigation & Diagnostic Centres sent an email to two colleagues working in PEQ, with the subject “Kiwi fruit disease”. The email read:¹⁶⁶

“this came out at ELT [Executive Leadership Team] it was in the Minister’s radar. The disease is spreading from Italia, Chile and other countries. I think this issue came up a few months ago but can't remember details. If you have any info can you please send it to me. Apparently it is only in K gold”

280. On 23 August 2010, an internal response was sent from the Plant Health & Environment Laboratory in Auckland,¹⁶⁷ that included a copy of the EPPO 2009 alert on Psa and the July 2010 ‘Pathogen of the Month’ one-page profile from the Australasian Plant Pathology website. It was noted that disease incidence in Italy had ranged from 50-80% and that economic losses were estimated at 2 million euros.¹⁶⁸ The MAF staff member noted “It is assumed that spread of this pathogen is via the planting of infected propagation material....PHEL has good molecular diagnostic protocols in place that will identify Psa and enable differentiation from other non-regulated Pseudomonads.”

281. There are several points to note from this interaction:

- By August 2010 there were at least some discussions being held at senior levels of MAF regarding the risk of Psa, albeit it appears ELT was discussing Psa in reaction to comments made by the Minister rather because its monitoring processes had flagged Psa as a serious concern.
- Awareness of the risks posed by Psa and the potential pathways was certainly not very high, given that discussion at ELT appears to have been an informal discussion and the Head of Investigation and Diagnostic Centres recalled Psa being an issue several months prior but could no longer recall the relevant details.
- While it is reassuring that the senior meeting resulted in someone subsequently examining the extent to which Psa was an issue for their area of responsibility (i.e. nursery stock imports), this was a one-off enquiry rather than part of a systematic assessment of the risks through all pathways.

282. As noted above, on 30 September 2010 MAF received an email from Plant & Food stating: “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.” This notification from Plant & Food did not prompt any emails or action from MAF.

¹⁶⁶ Email from Dr Veronica Herrera, 17 August 2010, 6.02pm

¹⁶⁷ Email from MAF staff member, 23 August 2010, 11:28am

¹⁶⁸ Note, the estimate of 2 million dollar losses in Italy came from the 2009 EPPO alert and would be nearly a year out of date. As indicated, the most dramatic expansion and material losses from the Italian outbreak occurred from March to June 2010.

283. MAF had already identified imports of nursery stock as the most probable vector for the transmission of Psa¹⁶⁹ and the import requirements for nursery stock were developed on the basis that quarantine requirements had to be sufficiently robust to detect plants carrying Psa. As such, the conclusion that nursery stock can be infected with Psa yet show little or no visible symptoms would not have surprised MAF staff.
284. We conclude that the Plant & Food finding with respect to nursery stock was not new information and that MAF acted quite appropriately in not taking further action.
285. It is also relevant to note that Zespri did not urge MAF to change the import requirements for nursery stock in light of the Plant & Food comments. Zespri staff have commented that they had no concerns at the time about the importation of nursery stock from Psa-infected orchards - Zespri had been a party to testing imported nursery stock and was satisfied with what it considered to be rigorous testing requirements.

The testing regime to detect Psa on plants in quarantine would not reliably detect Psa

286. As outlined above at paragraphs 78-82, MAF amended the import requirements for nursery stock in 2006 after concluding that one of the two testers to test quarantined plants for Psa was unreliable. This left one molecular test to be used in PEQ to detect Psa (PCR, using PAV 1/P 22 primers) as well as ongoing visual observations for symptoms. At that point in time use of these methods were considered to represent international best-practice for detecting Psa in nursery stock.
287. On 4 October 2010, a MAF Biosecurity Inspector emailed a MAF staff member in the Plant Imports and Exports Group about a consignment of nursery stock in a Plant & Food Level 3 PEQ facility:¹⁷⁰
- “All testing is complete and has been negative however, the outbreak of pseudomonas in Italy where this consignment has been sourced could put the spotlight on the potential release of this consignment.
- Recent literature has shown that without symptoms of Pseudomonas, it is unlikely that PCR will detect presence of pseudomonas.”
288. That the testing regime was unlikely to detect Psa on symptomless plants is very concerning, given that Psa has been known to lie dormant in plants for up to three

¹⁶⁹ Email from Risk Analysis Team, 8 April 2010, 10.55pm stated “Nursery stock is the most likely pathway for entry but has had good controls for many years (level 3 quarantine etc) and this bacteria is on the pest list.” The two page summary produced by MAF on Psa also noted “EPPO (2009) state trade of infected planting material can spread the disease over long distances”. The Actindia schedule to the Nursery Stock IHS had also been designed to address the risks of Psa-infected plants entering the country.

¹⁷⁰ Email from MAF Biosecurity Inspector to MAF staff member, 4 October 2010, 2:58pm

years¹⁷¹ and that plants were only required to be held in quarantine for a minimum of six months. The Inspector noted that Plant & Food staff were concerned about the reliability of the testing and were proposing to change the environmental conditions in PEQ to stimulate symptoms of any Psa that might be present – in light of their knowledge from Italy that Psa was most virulent under cool conditions, with rain and high humidity.¹⁷²

289. Following an email from MAF requesting further information about the concerns with testing for Psa, Plant & Food notified MAF that they were initiating an internal review of all MAF-registered Plant & Food quarantine facilities that were undertaking Psa testing of imported products.¹⁷³ Plant & Food advised that:¹⁷⁴

“[t]he purpose of this is to ensure that internally we are operating well above the required regulatory levels for PSA work, and to safeguard both our staff and the security of the New Zealand kiwifruit industry...I am sure you will agree that both MAF and PFR wish to proceed with upmost [sic] caution given the potential significance of this disease.”

290. The email exchanges between MAF and Plant & Food staff on this topic are attached in Appendix 8.

MAF ensured consignments did not receive clearance from quarantine until concerns regarding Psa-testing were resolved

291. Once MAF became aware that the testing for Psa in quarantine facilities would not reliably detect Psa it prudently withheld biosecurity clearance for the consignments in quarantine until these concerns could be addressed. A ‘Decision Document’, dated 4 November 2010, concluded that nursery stock currently held in PEQ should not be given clearance on the basis that there was sufficient uncertainty about the phytosanitary status of the consignment and that granting clearance would be unwise.¹⁷⁵

¹⁷¹ Koh, Nou, ‘DNA markers for identification of *Pseudomonas syringae* *pv.* *actinidiae*’ (2002) *Molecules and Cells* 13:309-314

¹⁷² The literature referred to as calling into question the reliability of the testing was Cupples, D.A., Louws, F.J., and Ainsworth, T., 2006. ‘Development and evaluation of PRCR-base diagnostic assays for the bacterial speck and bacterial spot pathogens of tomato’ *Plant Dis.* 90: 451-458. Rees-George, J., Vanneste, J. L., Cornish, D., A., Pushparajah, I. P. S., Yu, J., Templeton, M. D. and Everett, K. R. (2010) ‘Detection of *Pseudomonas syringae* *pv.* *actinidiae* using polymerase chain reaction (PCR) primers based on the 16S-23S-rDNA intertranscribed spacer region and comparison with PCR primers based on other gene regions’ *Plant Pathology*, also concluded that the PCR primers specified in the IHS are not sensitive enough to be the sole test for screening for Psa.

¹⁷³ Email from Plant & Food staff member to MAF staff member, 20 October 2010: 12:34pm

¹⁷⁴ *ibid*

¹⁷⁵ MAF Decision Document ‘*Actinidia* nursery stock in PEQ – biosecurity risk posed by *Pseudomonas syringae* *pv.* *actinidiae* outbreak in Italy’, 4 November 2010.

292. The document noted the significant biosecurity threat posed by Psa to the kiwifruit industry and that a review needed to be undertaken of the Actinidia schedule in the IHS.
293. On 4 February 2011 (after the detection of Psa in New Zealand) a second Decision Document was produced recommending that the two consignments still in PEQ be released. This release was subject to testing being undertaken with testers of improved sensibility (a modified conventional PCR-based assay: Psa F1/R2), samples for testing being collected at two separate time points, and the plants being held under optimal conditions for Psa symptom expression. Both consignments were subsequently released.
294. We consider MAF acted appropriately in halting the release of the two nursery stock consignments from quarantine until such time as it could get greater assurance that the testing regime had been made sufficiently robust. Although it took one month from when MAF was informed about concerns with the testing regime until it decided that the consignments should not be released, this is not an issue in the case of release from PEQ – where the goods could not have been released without MAF’s consent.

MAF failed to initiate procedures to track down previous imports of nursery stock

295. While MAF acted promptly to halt the release of plants from quarantine until testing for Psa was improved, no-one at MAF appears to have considered the potential ramifications from the release of earlier nursery stock imports that were given biosecurity clearance under a flawed testing regime.
296. The Decision Document of 4 November 2010 documents MAF’s view that the testing regime in place to detect Psa on nursery stock imports was sufficiently unreliable, and the threat of Psa to the kiwifruit industry was so significant, that consignments currently being held in quarantine should not be released. One would expect that as soon as MAF initiated procedures to prevent nursery stock being released from quarantine it would also consider tracing where earlier imports ended up and whether they were showing any symptoms of Psa. The first case of Psa in New Zealand was reported to MAF the day after the Decision Document was approved, which may have curtailed any plans to begin tracing the movements of those plants that had already been released. However, in the many emails and drafts of the Decision Document that circulated in the month that followed the initial concerns about the testing regime, no one considered the implications for previously cleared imports.
297. It is relevant to note that MAF’s Tracing Report states that, following the Psa outbreak in New Zealand, the six consignments of nursery stock that had been given biosecurity clearance were identified and none of them showed symptoms of Psa.¹⁷⁶ While this may indicate that nursery stock imports were not infected with Psa, this was certainly not known at the time.

¹⁷⁶ MAF Tracing Report, page 19

298. The failure to trace past imports was not due to a lack of concern about Psa or a belief that nursery stock was not a viable pathway; that MAF acted cautiously in refusing to grant biosecurity clearance testifies to the fact that staff were well aware of the potential risks posed by Psa-infected plants. We can only conclude that the potential threat posed by previously released plant material simply did not cross anyone's mind.

MAF had not identified issues with the Psa testing regime for nursery stock

299. As is apparent from the emails contained in Appendix 8 the first time staff in the MAF standards teams were aware of concerns about the reliability of the Psa testing regime for nursery stock was in October 2010. However, these concerns about the adequacy of PCR primers for detecting Psa were documented many months previously: in a scientific article that was authored by Plant & Food scientists and published online in February 2010 and subsequently published in the journal 'Plant Pathology' in June 2010¹⁷⁷ - articles which explicitly acknowledged the contribution of MAF staff.

300. There was obviously a poor communication between MAF staff on this issue, although it is pertinent to note that no plants were released from quarantine during the period between when the scientific paper was published and when MAF staff acted to address the concerns with the testing regime.

301. Even if one ignores the internal communication problems, it is concerning that MAF staff were unable to identify the inadequacies of the testing regime. For example, one would expect MAF staff working on import standards to have come across the findings through any of the following:

- monitoring what appears to be an internationally-renowned journal (Plant Pathology) on plants and matters of biosecurity interest (particularly a role for the MAF Risk Analysis Team);
- setting up monitoring alerts regarding research on kiwifruit and Psa;
- having a close working relationship between the MAF standards teams and the Plant & Food executive team to ensure staff are familiar with research of interest; or
- at any stage in 2010 initiating a pest-risk assessment of Psa and an analysis of the adequacy of the existing import requirements.

There was an over-reliance on quarantine arrangements to keep Psa out of New Zealand

302. The import requirements did not prohibit imports of plant material from regions, or even orchards, which were infected with Psa. Complete reliance was instead placed on being able to detect any Psa-infected plant while they were still in quarantine. In

¹⁷⁷ Rees-George, J., Vanneste, J. L., Cornish, D., A., Pushparajah, I. P. S., Yu, J., Templeton, M. D. And Everett, K. R. (2010) 'Detection of *Pseudomonas syringae* pv. *actinidiae* using polymerase chain reaction (PCR primers based on the 16S-23S-rDNA intertranscribed spacer region and comparison with PCR primers based on other gene regions.' *Plant Pathology*

light of the economic consequences of any possible entry by Psa into New Zealand and the concerns that were expressed about the effectiveness of the testing regime for nursery stock we conclude that from 2009 onwards there was an over-reliance on quarantine arrangements to detect and keep out Psa-infected plant material.

303. While it may be easier to make such an assessment with the benefit of hindsight, the following internal MAF emails show that concerns were beginning to be expressed by MAF staff just prior to the Psa outbreak in New Zealand:

Email	Relevant Excerpts
1 November 2010, 11:26am Email from MAF staff member	“I have done a quick scan on the internet of Pseudomonas syringae pv actinidae and from what I can see I would consider that we need to implement some urgent amendments to the IHS. If it got here it would significantly impact the NZ kiwifruit industry, which is huge for NZ....”
1 November 2010, 12:09pm Follow-up email from the same MAF staff member	“I think it is worth taking a precautionous [sic] approach with this one, if it got into NZ it would really devastate our kiwifruit industry which is worth millions. MAF would also be crucified. I think we need to look at additional measures and whether we should even be importing budwood from countries where this bacteria is widespread such as Italy.”
2 November 2010, 2:41pm Separate email from MAF scientist	“Psa is a relatively new emerging pathogen and there are significant information gaps in the literature with regards to the biology and detection of Psa associated with latent infections. Given this uncertainty, we do not consider that testing alone would provide the appropriate level of protection with the increased risk of sourcing budwood from a disease outbreak area. It may be prudent that the PEQ period is extended to that of other high value commodities for example, citrus and vitis.”

304. As noted earlier in this paper, the import requirements set by MAF were appropriate in 2004. However, in light of the economic implications of the Italian outbreak MAF should have promptly revisited whether the PEQ requirements remained appropriate. There are a number of concerns with the PEQ requirements:

(a) **MAF did not consider halting imports of plant material from areas known to be infected with Psa**

Given the serious risks that Psa posed to the New Zealand in 2009/10, it is not clear whether there was a sufficient case to permit the importation of plant material from Psa-infected areas. Even in the absence of concerns about the efficacy of the Psa testers one would expect MAF and the industry to at least be asking very serious questions about whether the import of plant material from Psa-infected regions should have been halted, or at the very least been treated differently in PEQ (e.g. held for a longer period).

(b) **The length of time plants were in PEQ was too brief to guarantee the presence of any Psa symptoms**

Kiwifruit nursery stock was required to be kept in quarantine for at least six months, but it is not clear whether this was sufficient for symptoms of any Psa that might be present to develop and be detected.¹⁷⁸ The comment from a MAF scientist that “It may be prudent that the PEQ period is extended to that of other high value commodities for example, citrus and vitis”¹⁷⁹ calls into question whether MAF should have tailored the PEQ period when the economic threat that Psa posed to the industry became more apparent in 2010.

MAF advise that “For Actinidia there is a relatively short list of regulated organisms, and the 6 months minimum PEQ period was considered sufficient to complete all testing and growing season inspection.”¹⁸⁰

(c) **The lack of specified environmental conditions for when testing for Psa should take place**

Plant & Food took it upon themselves to change the environmental conditions in which they kept nursery stock imports to increase the growth and symptoms of any Psa that might be present in the plant material. This change in PEQ was not an import requirement nor a suggestion from MAF. MAF advise that “Specifying the appropriate time of year to test for particular organism types is a new addition for import requirements”,¹⁸¹ albeit by 2009 a specific time of the year for testing is included in *Fragaria* and *Rubus* schedules and that MAF has begun imposing such specifications through import permits where the IHS does not provide such level of detail.

305. It is possible that the concerns with PEQ outlined above might have been detected earlier had MAF responded to the Italian Psa outbreak by initiating a pest risk assessment or a review of all known pathways for the pest.

Summary: import requirements were not adequately reviewed

306. Based on the available evidence and discussions with stakeholders we conclude that:

- (a) From 2009 onwards the outbreak of Psa in Italy was an observable event and marked a significant development in the risk posed by Psa to the New Zealand kiwifruit industry.

¹⁷⁸ As evidenced by the concerns expressed by Plant & Food

¹⁷⁹ Email from MAF scientist, 2 November 2010, 2:41pm. Citrus nursery stock have a PEQ period of at least 16 months.

¹⁸⁰ Response to Sapere Research Group’s additional information request, emailed 29 March, 1:10pm

¹⁸¹ *ibid*

- (b) The reaction in New Zealand to the outbreak of a virulent strain of Psa in Italy was inadequate:
- (i) There is no evidence MAF recognised that Psa now represented a biosecurity threat of an order of magnitude greater than when the import requirements were put in place. Psa was never identified by MAF's Emerging Risks and Opportunities Committee as an emerging risk of concern.
 - (ii) In light of noticeable changes in the risk profile of Psa and in line with their internal guidelines, MAF should have undertaken a pest risk assessment of Psa (as Australia did). This should have included examining all possible pathways for the pest, considering the economic consequences should Psa enter New Zealand, revisiting existing import requirements, and tailoring border processes accordingly.
 - (iii) Zespri, in light of its first-hand knowledge of the impact Psa was having on Italian orchards and its commercial interests in New Zealand, must accept responsibility for not actively examining the existing import requirements and bringing any concerns about Psa to policy-makers.
- (c) When MAF did review the appropriateness of import requirements in light of the risks posed by Psa, it did so only in response to concerns from external organisations. This led to a reactive and fragmented assessment of the risks of Psa across individual pathways. There is no evidence of MAF leadership across these responses, of co-ordinated analysis and engagement with industry, or of any concerted effort to assess the strategic threat Psa posed to the New Zealand industry.
- (d) MAF's response to concerns about Italian **kiwifruit** imports was appropriate.
- (e) MAF's response to concerns about **kiwifruit pollen** imports was sub-standard:
- (i) Up until the outbreak of Psa in New Zealand, pollen was not on MAF's radar as a possible vector for Psa. MAF's Risk Analysis Team, which is tasked with monitoring emerging risks, was unaware in 2010 that imports of pollen were taking place.
 - (ii) MAF was informed on 30 September 2010 and again on 11 October 2010 that Psa could be detected on pollen samples from infected orchards in Italy but did not take action.
 - (iii) The finding that live Psa could be detected on kiwifruit pollen samples undermined MAF's position that 'there are no pests or diseases known to be associated with pollen of Actinidia'. Receipt of this information should have been sufficient to halt all pollen imports and to trigger a response plan to track imported consignments of pollen.
 - (iv) Plant & Food was aware in May 2010 that live Psa could be detected on kiwifruit pollen from infected orchards, but did not inform MAF as it was unaware commercial pollen imports might be taking place.

- (v) A situation existed from May 2010 where three separate groups across MAF and Plant & Food independently knew one of the following facts: (i) that Psa could be detected in pollen from infected orchards; (ii) that Psa was present in China; and (iii) that pollen imports from China were taking place for the purpose of artificial pollination of New Zealand orchards. This information was never collated and in June 2010 a further consignment of pollen from China was given biosecurity clearance (MAF has concluded this consignment, which subsequently tested positive for Psa, was never used).
- (vi) MAF staff were unaware that the Australian Quarantine and Inspection Service reacted to the Italian Psa outbreak by requiring all pollen imports to be tested for Psa. No such testing was put in place in New Zealand.
- (f) MAF's response to concerns about **nursery stock** imports was not sufficiently proactive:
 - (i) Too much reliance was placed on the ability to detect Psa on plants imported from Psa-infected regions. Given the severe and irreversible damage that would occur if the quarantine regime should prove fallible, MAF (and the industry) should have been questioning in 2009/10 whether imports of plant material from Psa-infected regions should be halted.
 - (ii) The MAF Plant Imports & Exports Group acted promptly in October 2010 when it learned that the tests being used on kiwifruit plants in quarantine would not reliably detect Psa. MAF agreed with Plant & Food's suggestion to alter environmental conditions in order to maximise the chances of observing any Psa symptoms that might be present and plants that were in quarantine were not released until the additional testing was carried out.
 - (iii) MAF staff failed to consider the possibility of tracing and re-testing those plants that had previously been released from quarantine under the unreliable testing regime.
 - (iv) Had MAF undertaken a formal pest risk assessment for Psa following the Italian outbreak, staff in the Plant Imports and Exports Group might have learned of the inadequacies with quarantine testing much earlier, as the findings were originally published in February 2010 (note, no plants were released from quarantine between February 2010 and the outbreak of Psa in New Zealand).

The efficacy of the border processes

307. This section examines the relevant border processes across the five risk goods that are the subject of this paper. The appropriateness of the import requirements that were in place prior to the outbreak of Psa in New Zealand have already been canvassed in the preceding sections. This section instead examines whether the border processes appropriately and effectively implemented these requirements.
308. While there may have been no systematic failing, there were three specific areas of concern that may have unnecessarily increased the risk of a biosecurity breach:
- (a) a decision to release a consignment of nursery stock from quarantine without undertaking testing for Psa;
 - (b) border staff wrongly allowed a consignment of ‘anthers’ from China to enter the country (imported under a permit for pollen); and
 - (c) border staff wrongly allowed consignments of gold kiwifruit from Italy to enter the country (imported under an IHS for green kiwifruit).
309. Although not giving rise to the same level of biosecurity concern, we also note the inability by front-line staff to verify whether all the imported pollen had been certified as meeting the phytosanitary requirements.

The border processes for the import of nursery stock were largely appropriate

310. As noted earlier, the import requirements for budwood and tissue culture are contained within the Nursery Stock IHS. The Actinidia schedule in the Nursery Stock IHS then specified additional obligations on kiwifruit nursery stock (while noting that only dormant cuttings and tissue culture of this species can be imported):
- (a) an import permit is required;
 - (b) a phytosanitary certificate is required, with the NPPO of the exporting country only to issue a certificate if they were satisfied that the relevant nursery stock had been:
 - (i) inspected and free from visually detectable regulated pests;
 - (ii) treated for regulated insects/mites as described in MAF’s approved treatment paper within 7 days of shipping (cuttings only); and
 - (iii) held in a manner to ensure that infestation/reinfestation does not occur following certification.
 - (c) if satisfied that the pre-shipment activities have been undertaken, the exporting country NPPO must confirm this by recording the treatments;
 - (d) tissue cultures cannot contain charcoal; and

- (e) all imports must go into a level 3 post-entry quarantine (PEQ) facility, where they will be grown for a minimum of six months, with regular inspections, testing and treatment for regulated pests as specified in the document 'Inspection, Testing and Treatment Requirements for Actinidia'.
311. In addition imports of both budwood and tissue cultures must meet other 'basic conditions' as set out in sections 2.2.1.5 and 2.2.2.3 of the Nursery Stock IHS: including appropriate labelling, use of inert/synthetic material for packaging, treatment for insects/mites etc.
312. Appendix 4 contains the details of imports of kiwifruit nursery stock into New Zealand from 2000 - 2011. This shows that imports of kiwifruit nursery stock occurred on 14 occasions, with plants being released from quarantine on 6 occasions prior to the detection of Psa in New Zealand.¹⁸² In total 53 kiwifruit plants and 644 tissue cultures were released from quarantine from 2000 until the outbreak of Psa in New Zealand.

Release of plant material without testing for Psa

313. On 8 February 2001, an import by Zespri of 120 budwood cuttings arrived in New Zealand.¹⁸³ While in PEQ some of the plants tested positive for the Apple Stem Grooving Virus, Tobamovirus, and the Flxivirus. The detection of these pests was what prompted the 2004 review of the Nursery Stock IHS (and the subsequent inclusion of Psa as a regulated pest, albeit not in response to this particular consignment). By 24 July 2008, 11 plants had been given biosecurity clearance and were released from PEQ.
314. Of relevance to this review is that, despite Psa being a regulated pest since 2004 and mandatory Psa testing being a condition before any nursery stock imports could be given clearance, these plants were never tested for Psa prior to their release.
315. MAF has stated that the reason the 'Yang Shen Mou' plant material was not tested for Psa in 2008 was because the terms of the 2001 import permit under which they were imported did not recognise Psa as an actionable pest. MAF's has advised that:¹⁸⁴

"Psa testing did not occur for this consignment as the plant material was imported under an earlier version of the import health standard & valid import permit."

"The permit to import includes a clause (bottom of Appendix 1 for Permit Number 2001011336):

¹⁸² As examined above at paragraphs 286-301, a further two consignments imported in 2010 were held in PEQ until concerns about the effectiveness of the testing regime. These were subsequently released in 2011.

¹⁸³ Consignment C2004/58742 imported under permit number 2001011336

¹⁸⁴ Index of documents provided for the Independent Review of Importation of Plant Material and Nursery Stock, folder 3

‘11. If an import health standard is approved by a Chief Technical Officer prior to the **expiry date indicated on this Permit to Import**, the conditions on the import health standard, if different, would override the conditions on the Permit to import.’ (emphasis in original)

The expiry date of the permit to import was 24 February 2002. Specific measures for Psa were not included in the IHS until 2004. On that basis, the goods could be given biosecurity clearance under this permit to import without specific testing for Psa.”

316. It is very concerning that at a time when MAF was testing all kiwifruit nursery stock in PEQ for Psa prior to release it did not also test these plants. While these plants had been in PEQ for 7 years by the time of their release without showing any symptoms of Psa, the approach described by MAF appears to rely on a legal technicality for not doing the testing. In order to effectively meet its responsibilities MAF should always apply the testing regime in place at the time of the release of the plants rather than at the time of the import – indeed section 27(a) of the Biosecurity Act 2002 specifically states that clearance of such goods should not be given unless “the goods comply with the requirements specified in an import health standard in force for the goods.”
317. MAF was asked to comment on whether they considered their ability to undertake testing for biosecurity purposes had been fettered by the conditions set in an import permit. MAF responded that the Biosecurity Act 2003 granted MAF “the authority to conduct any testing deemed necessary for plants in post entry quarantine.”¹⁸⁵ It was noted that if there had been a change in scientific knowledge or if symptoms had been observed then MAF would have considered additional testing. As it was, MAF advised that the plants showed no Psa-like symptoms in the 7 years in PEQ and that it was only after the consignment was released that there was greater awareness of the severe disease symptoms being observed in Italy.
318. It is also relevant to note that Zespri (as the importer) was strongly urging MAF to release those plants in the consignment that had tested negative for the viruses of concern. Zespri advised MAF that “the plant material has the highest potential commercial value for Zespri and the New Zealand kiwifruit industry.”¹⁸⁶

The border processes for the import of pollen were unsatisfactory

319. Kiwi Pollen’s imports of pollen were subject to a requirement in the Nursery Stock IHS that a visual inspection for pests at the border must not detect any infested units in a randomly drawn sample of 600 units. The import permits also set out following special conditions:

¹⁸⁵ Additional information supplied by MAF to Sapere Research Group on 29 March 2012, 1:10pm

¹⁸⁶ Letter from Zespri staff member to MAF staff member, undated

“Special Conditions:

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:*

“The male flower buds were hand collected and unopened.”

320. As noted earlier, the Plant & Food pollen imports were imported under an import permit for laboratory samples (as opposed to nursery stocks), so were subject to conditions that the pollen must not leave the transitional facility into which it was taken, that a record must be kept of the status of all imported pollen, and that any pollen remaining after analysis must be destroyed (there was also no requirement for the imports to be accompanied by a Phytosanitary Certificate).
321. Appendix 5 contains the details of the pollen imports into New Zealand. This shows that Kiwi Pollen imported 7 pollen consignments for propagation purposes and Plant & Food imported 6 pollen consignments for laboratory testing (2 of which were imported after the New Zealand Psa outbreak).

Biosecurity clearance was wrongly given to an import of ‘anthers’

322. The MAF Tracing report states that on 30 June 2009 biosecurity clearance was given to a consignment of ‘anthers’ from China, noting that “only a very small amount of material was imported approx 15gm of pollen”.¹⁸⁷ This pollen was reported to have been subsequently discarded.
323. An anther is “the part of a stamen that produces and contains pollen and is usually borne on a stalk”.¹⁸⁸ We have received independent scientific advice that ‘anthers’ are not ‘pollen’.¹⁸⁹ Therefore we conclude that the import of anthers did not meet the terms of the import permit and should not have been given biosecurity clearance. There was no valid IHS in place for the anthers at that time and they were not permitted into New Zealand.
324. The risks of allowing a consignment of anthers into the country could potentially be significant. The anthers would have been sourced from inside a closed flower bud, but MAF was not in a position to assess whether anthers posed a biological risk. Although at the time MAF had concluded that pollen could not transmit Psa, it was well aware that plant material was the most likely vector for Psa and was also aware

¹⁸⁷ MAF Tracing Report, approved 5 December 2011, page 17. MAF have advised that the findings that the consignment contained ‘anthers’ and that the volume of pollen was 15gm were both a result of an interview with Kiwi Pollen. This information is not captured on the primary documentation examined through this report (the Clearance Certificate issued at the time simply notes that ‘1 unit’ of ‘Nursery Stock’ was cleared).

¹⁸⁸ Miriam-Webster definition of ‘anther’.

¹⁸⁹ Interview with Senior Scientist (Plant & Food), 30 March 2012. It was noted this was a view on the scientific definition of ‘anthers’ and ‘pollen’ and not whether anthers could have been imported under the terms of the import permit.

that Psa could be detected on flower buds.¹⁹⁰ As was noted in paragraphs 144 - 146, it is possible this import resulted from a poorly worded import permit or was the result of the border staff being unable to determine that anthers were not technically pollen.

325. While the tracing report states that there was only “15 grams of anthers”¹⁹¹ in this consignment (which was reported as being subsequently discarded), both the pollen invoice¹⁹² and the Chinese Phytosanitary Certificate¹⁹³ state that the consignment weighed 4.5kg. That this may have been a relatively large import of anthers is a cause for serious concern. Assuming the anthers were subsequently milled in New Zealand, it is not known what happened to the not-insignificant volume of plant ‘cast-offs’ that would have been leftover from the milling process and have required disposal.

An inability to verify volumes of pollen imports

326. Our analysis of the pollen consignments identified a shortcoming in the ability of MAF to verify that a given volume of pollen entering the country had received phytosanitary certification. An NPPO will issue a Phytosanitary Certificate for the volume of actual pollen being shipped (i.e. before it is packaged); however MAF does not verify that the weight of the imported product matches the volume of certified pollen. Border staff do not unpack the consignments and weigh the pollen. Rather, the complete consignments are weighed, including packaging, prior to border clearance being given.
327. As pollen imports are shipped frozen the packaging will include ice and will be relatively heavy compared to the actual pollen. The documentation for the four Chilean consignments highlights the inability of MAF to correctly ascertain the volumes of pollen being imported based on documentation alone:
- (a) A consignment weighing 12.965kg that was given border clearance on 20 January 2009 (consignment c2008/352699) had 2.5kg of pollen certified as meeting phytosanitary standards prior to export.
 - (b) A consignment weighing 50.6kg that was given border clearance on 28 March 2009 (consignment c2009/67312) had 26kg of pollen certified as meeting phytosanitary standards prior to export.
 - (c) A consignment weighing 221.2kg that was given border clearance on 1 December 2009 (consignment c2009/296408) had 99kg of pollen certified as meeting phytosanitary standards prior to export.

¹⁹⁰ The two page summary of Psa produced by MAF in April 2010 (summarised above at paragraphs 195 - 196) specifically notes that Psa had been consistently isolated from kiwifruit flower buds.

¹⁹¹ MAF Tracing Report, page 16

¹⁹² Dated 5 June 2009

¹⁹³ Phytosanitary Certificate 470000209086862536 states that on 8 June 2009 the Chinese NPPO inspected a 4.5kg consignment being sent from Hangzhou Yuehao Agricultural Technology Consulting Co., Ltd. in Hangzhou to Kiwi Pollen in Te Puke. Signed 8 June 2009, Schenzen, China

- (d) A consignment weighing 54.4kg that was given border clearance on 3 May 2010 (consignment c2009/296408) had 21kg of pollen certified as meeting phytosanitary standards prior to export.
328. In these cases MAF would not have been unable to detect whether greater volumes of pollen entered the country than had met the phytosanitary requirements. Given that one shipment weighed 120kg in excess of the pollen that received phytosanitary clearance, one can legitimately question at what point border staff will decide to unpack the consignments and weigh the imported goods. We are certainly not alleging anything untoward occurred with these consignments, but simply note a potential flaw in the way the border process handles such imports.

The use of a retrospective Phytosanitary Certificate was appropriate

329. We note that Consignment c2008/352699 entered New Zealand on 14 December 2008 and that the Phytosanitary Certificate was not issued for that consignment by the Chilean NPPO until 9 January 2009: 26 days later.
330. When asked how an NPPO could retrospectively certify that a consignment met phytosanitary requirements MAF responded:¹⁹⁴
- “Generally NPPOs will not retrospectively issue Phytosanitary certificates. However where a PC is required that contains an additional declaration that can be verified by the NPPO retrospectively (as was the case with this pollen import), a PC may be issued. The decision to issue a phytosanitary certificate retrospectively is at the discretion of the relevant NPPO.”
331. We concur that the special conditions relating to pollen imports can be certified by an NPPO after the consignment has been shipped (i.e. they may have any number of arrangements to satisfy themselves that the pollen was hand-collected from unopened flower buds). MAF also advises that any pre-export inspections that took place prior to the consignment being shipped would have been recorded and that when requested to issue a Phytosanitary Certificate the NPPO would be able to easily verify whether an inspection had taken place. The issuance of a retrospective Phytosanitary Certificate in this case does not give cause for concern.
332. The other potential issue regarding the dates of Phytosanitary Certificates worth recording in this report is with respect to a consignment of pollen from China that entered the country on 6 June 2010 (consignment c2010/161762) accompanied by a Phytosanitary Certificate dated 28 May 2010. Kiwi Pollen’s previous import permit for China had expired so the consignment was held at the border until the permit was renewed. MAF advise that it is “a common occurrence” for Phytosanitary

¹⁹⁴ Additional information supplied by MAF to Sapere Research Group on 29 March 2012, 1:10pm

Certificates to pre-date import permits and that such cases can be managed at the border.¹⁹⁵ We do not have any concerns about MAF's handling in this case.

There was a minor irregularity with a Plant & Food consignment

333. Import permit 2010039663 specified that Plant & Food could import 36 sealed plastic bags of pollen (5g each). Yet the Biosecurity Authority / Clearance Certificate issued on 3 May 2010 states that a consignment of 39 bags of pollen was cleared for transfer to the Transitional Facility.¹⁹⁶
334. MAF's decision to approve the clearance of this consignment is a breach of the terms of the import permit. It is not clear whether MAF failed to note that the import permit had not been complied with, or made a conscious decision to release the goods in the belief that it was not a significant breach of the permit.
335. We note that the ramifications of this decision would be negligible, albeit it is not a satisfactory state of affairs for the specific terms of an import permit to be so obviously contravened. As Plant & Food was importing laboratory samples into a controlled environment it did not need to have an accompanying Phytosanitary Certificate or to ensure the samples were free of pests. Therefore if MAF decided to withhold biosecurity clearance, the three extra samples would simply be held at the border until Plant & Food could get a new import permit issued – and as has been noted, such applications were typically turned around by MAF within 1-2 days.

There was a minor irregularity with the Chinese Phytosanitary Certificates

336. We note that a condition of the Kiwi Pollen import permits was that the Phytosanitary Certificates that accompanied the imports were to declare: "The male flower buds were hand collected and unopened." Both the Phytosanitary Certificates that accompanied the two imports from China instead stated: "Pollen has been produced from hand collected and unopened male flower buds only".
337. We consider this to a minor variation and do not consider it undermined the import requirements for pollen in any way. MAF acted pragmatically in releasing the two consignments.

The border processes for kiwifruit were ineffective

338. Green kiwifruit could be imported from Italy and the USA under the IHS in place prior to the Psa outbreak. Under the terms of the IHS, consignments were required to be inspected for visually detectable pests both offshore (and certified as such on the relevant Phytosanitary Certificate) and at the border. The consignments from

¹⁹⁵ *ibid*

¹⁹⁶ Biosecurity Authority / Clearance Certificate B2020/101056, issued on 3 May 2010

Italy were also required to be held for a period of time at very low temperatures to reduce the likelihood that fruit flies might accompany the consignment. There is no evidence to suggest these requirements were not complied with.

339. As per the MAF Tracing report, 7,000 tonnes of kiwifruit were imported into New Zealand from 2000 until the outbreak of Psa:

Origin of kiwifruit imports	Weight (tonnes)	Number of consignments
Italy	6,700	285
USA	300	23

340. One issue that has arisen is that consignments of gold kiwifruit were imported from Italy – in breach of the requirement that only green kiwifruit imports could be imported into New Zealand.
341. A gold kiwifruit with symptoms of what appeared to be dead white peach scale was discovered in a Tauranga New World supermarket by a Plant & Food scientist on 20 March 2010.¹⁹⁷ As white peach scale was not a known New Zealand pest, the scientist made subsequent enquiries that identified that the gold kiwifruit was most likely an Italian import.
342. Three consignments of gold kiwifruit, totalling 68 tonnes, have been confirmed as being imported from Italy.¹⁹⁸ The Phytosanitary Certificates accompanying those consignments specifically stated that the kiwifruit were ‘gold’.
343. MAF’s investigation also identified the possibility that further imports of Italian gold kiwifruit might have taken place – due to a possible confusion between the descriptions of green kiwifruit (*Actinidia deliciosa*) and gold kiwifruit (*Actinidia chinensis*). Six Phytosanitary Certificates issued by the Italian NPPO in 2009 described the imported consignments as “*Actinidia deliciosa* = *chinensis* (kiwifruit)”. It is not possible to confirm whether gold or green kiwifruit imports took place under these ambiguous Phytosanitary Certificates.¹⁹⁹ The kiwifruit in these consignments totalled 147 tonnes.²⁰⁰
344. MAF acted promptly when it was informed that gold kiwifruit imports were likely to have been taking place. It contacted the Italian NPPO to inform them that gold kiwifruit imports were not permitted and stated that it would no longer be accepting

¹⁹⁷ Email from Plant & Food staff member to MAF staff member, 23 March 2010, 9:56am

¹⁹⁸ Given border clearance under C2009/300132, C2009/310386, and C2009/318951

¹⁹⁹ Although the term *Actinidia chinensis* is now used to denote gold kiwifruit, it was originally the species name for all kiwifruit. Therefore the Italian NPPO may in fact have been issuing these Phytosanitary Certificates for green kiwifruit.

²⁰⁰ Given border clearance under C2009/306222, C2009/312165, C2009/318931, C2009/322931, and C2009/322956

consignments accompanied with the same vague description of the type of kiwifruit. A 'flash report' was also issued for Biosecurity New Zealand officers to advise them of the situation and to provide advice on how to differentiate between green and gold kiwifruit.²⁰¹

345. Although kiwifruit were not considered a possible vector for Psa at that time, it is concerning that border staff were unable to detect that the terms of the IHS had not been complied with, even when the accompanying Phytosanitary Certificate explicitly stated that gold kiwifruit were being imported. Advice provided to MAF by Plant & Food in 2010 was that "The *A. Chinensis* [gold] varieties have substantially different pest and disease susceptibility than the original Green (*Actinidia deliciosa*) kiwifruit and need to be assessed separately."²⁰² This oversight is even more troubling given the presence of dead white peach scale on a piece of imported fruit, which had not been detected by inspections in both Italy and New Zealand.

The border processes for kiwifruit seeds were appropriate

346. Under the terms of the IHS imported kiwifruit seeds were required to be free from visually detectable pests and were to be grown in a Level 3 PEQ facility for at least six months, with regular inspections and testing for Apple Stem Grooving Virus prior to release.
347. From 2000 to 2010, 11 consignments of kiwifruit seeds entered the country, all of which were transferred to a Plant & Food PEQ facility (ten consignments were from China, with one consignment from Nepal). From June 2009 to October 2010, 324 plants grown from five of these consignments of imported kiwifruit seeds were released from PEQ. The details of these imports are outlined in Appendix 6.
348. As noted above, Psa was not a regulated pest for kiwifruit seeds, so the plants were released from quarantine without testing for the pest. The plants would have been inspected on at least four occasions for any symptoms of pests and would have been tested for the only identified regulated pest, the Apple Stem Grooving Virus.
349. There is no evidence to suggest the border process for implementing the import requirements for kiwifruit seeds was anything other than robust.

The border processes for horticultural equipment were appropriate

350. It is not practical within the scope of this review to examine whether the import requirements were correctly applied for every import of used horticultural equipment

²⁰¹ Flash report 'Gold vs Green Kiwifruit' (15 April 2010), reference 4302/NE

²⁰² Email from Plant & Food staff member to MAF staff member, 23 March 2010, 9:56am

that might have subsequently been used on a kiwifruit orchard. There are simply too many possible pieces of equipment that may or may not have ended up on a kiwifruit orchard, and it is also impossible to determine whether a single inspection may have overlooked a possible contaminant.

351. Instead, we can express confidence regarding the level of scrutiny that is applied to imports of used equipment more generally. It would be extremely difficult for large pieces of equipment (trailers, sprayers, tractors) to be imported into the country without being identified for inspection at the border. While there is always the possibility that an inspection might fail to detect a contaminant, our interviews and walk-through of the border processes highlighted a degree of professionalism that would mean any such event would likely be a rare occurrence.
352. We note MAF's Tracing Report has attempted to identify individual pieces of kiwifruit-specific equipment that may have been imported.²⁰³ In particular a tractor-mounted pollen application unit and a number of hand-held pollen dusters might have been used in Italy prior to import to New Zealand. Whether or not specific items may have posed a biosecurity risk is best left to a forensic study such as the Tracing Report.
353. As with all other risk goods, one can also not rule out that horticultural equipment entered the country and was not declared to authorities at the border – for example, a small item such as used pruning shears could quite possibly remain undetected if they were packed in the suitcase of an orchardist returning from a trip to Italy. Considerable investment is made into maintaining border security, but it is of course not possible to prevent the unauthorised entry of goods.
354. The border processes for handling imports of horticultural equipment appear robust and appropriately targeted. We have not identified any aspects of these processes that would give rise to concern.

Summary: there were several material shortfalls with the border processes

355. Based on the available evidence and discussions with stakeholders we conclude that:

- (a) There were no systematic failings at the border in the implementation of the import requirements for the five risk goods. There were however several significant errors of judgment that unnecessarily increased the risk of a biosecurity breach.
- (b) The border processes for **nursery stock** imports were largely appropriate, with the notable exception of the decision to release 11 plants from quarantine in 2008 without testing them for Psa.

²⁰³ MAF Tracing Report, pages 25-26

- (c) The border processes for **pollen** imports were unsatisfactory:
 - (i) Border staff should not have given biosecurity clearance to a consignment of ‘anthers’ that were imported under a ‘pollen’ import permit from China.
 - (ii) Border staff would not have been able to verify the volumes of imported pollen and therefore could not be sure that all the imported pollen had received the appropriate phytosanitary certification (there is no indication that the pollen did not receive certification).
- (d) The border process for **kiwifruit** imports failed to detect that imports of gold kiwifruit from Italy were occurring without a valid IHS in place.
- (e) There were no issues identified with the border processes with the import of **kiwifruit seeds**.
- (f) There were no issues identified with the border processes with the import of **horticultural equipment**.

Findings and recommendations

356. We set out in this chapter the detailed findings from the previous chapters as well as a number of recommendations for MPI. Our findings mirror the structure of the report and are grouped into three areas:
- (a) The adequacy of import requirements prior to 2009;
 - (b) The adequacy of import requirements in 2009/2010 (in light of changing circumstances); and
 - (c) The efficacy of the border processes.

Detailed findings

The adequacy of import requirements prior to 2009

357. Based on the available evidence and discussions with stakeholders we conclude that:
- (a) MAF appropriately recognised the risk that Psa posed to the kiwifruit industry in the period to 2009.
 - (b) The import requirements for **nursery stock** were appropriate in the period to 2009 and reflected a prudent approach by MAF to managing risk from Psa.
 - (c) The import requirements for **kiwifruit pollen** were inadequate in the period to 2009:
 - (i) A 2007 scientific paper co-authored by MAF and Auckland University staff understated the risk of pollen-transmission of bacteria.
 - (ii) MAF staff approving import permits for pollen reasonably relied on this scientific paper in believing that pollen would not transmit Psa.
 - (iii) Irrespective of the scientific evidence for whether pollen could transmit Psa, MAF staff failed to appreciate that the process for milling pollen prior to import would mean the consignments of pollen would inevitably include other plant material (a recognised vector for Psa).
 - (iv) MAF should have undertaken a risk analysis for pollen imports, which might have identified the risks from accompanying plant debris and possible measures to mitigate such risks (such as testing consignments for Psa).
 - (v) MAF was correct not to consult industry on the pollen import requirements in the Nursery Stock IHS.
 - (vi) Although not legally required to do so, MAF should have consulted with industry prior to allowing the first consignment of kiwifruit pollen to enter the country.

- (d) The import requirements for **kiwifruit** were appropriate in the period to 2009.
- (e) The import requirements for **kiwifruit seeds** were appropriate in the period to 2009.
- (f) The import requirements for **horticultural equipment** were appropriate in the period to 2009.

The adequacy of import requirements in 2009/2010

358. Based on the available evidence and discussions with stakeholders we conclude that:

- (a) From 2009 onwards the outbreak of Psa in Italy was an observable event and marked a significant development in the risk posed by Psa to the New Zealand kiwifruit industry.
- (b) The reaction in New Zealand to the outbreak of a virulent strain of Psa in Italy was inadequate:
 - (i) There is no evidence MAF recognised that Psa now represented a biosecurity threat of an order of magnitude greater than when the import requirements were put in place. Psa was never identified by MAF's Emerging Risks and Opportunities Committee as an emerging risk of concern.
 - (ii) In light of noticeable changes in the risk profile of Psa and in line with their internal guidelines, MAF should have undertaken a pest risk assessment of Psa (as Australia did). This should have included examining all possible pathways for the pest, considering the economic consequences should Psa enter New Zealand, revisiting existing import requirements, and tailoring border processes accordingly.
 - (iii) Zespri, in light of its first-hand knowledge of the impact Psa was having on Italian orchards and its commercial interests in New Zealand, must accept responsibility for not actively examining the existing import requirements and bringing any concerns about Psa to policy-makers.
- (c) When MAF did review the appropriateness of import requirements in light of the risks posed by Psa, it did so only in response to concerns from external organisations. This led to a reactive and fragmented assessment of the risks of Psa across individual pathways. There is no evidence of MAF leadership across these responses, of co-ordinated analysis and engagement with industry, or of any concerted effort to assess the strategic threat Psa posed to the New Zealand industry.
- (d) MAF's response to concerns about Italian **kiwifruit** imports was appropriate.
- (e) MAF's response to concerns about **kiwifruit pollen** imports was sub-standard:
 - (i) Up until the outbreak of Psa in New Zealand, pollen was not on MAF's radar as a possible vector for Psa. MAF's Risk Analysis Team, which is tasked with monitoring emerging risks, was unaware in 2010 that imports of pollen were taking place.

- (ii) MAF was informed on 30 September 2010 and again on 11 October 2010 that Psa could be detected on pollen samples from infected orchards in Italy but did not take action.
 - (iii) The finding that live Psa could be detected on kiwifruit pollen samples undermined MAF's position that 'there are no pests or diseases known to be associated with pollen of Actinidia'. Receipt of this information should have been sufficient to halt all pollen imports and to trigger a response plan to track imported consignments of pollen.
 - (iv) Plant & Food was aware in May 2010 that live Psa could be detected on kiwifruit pollen from infected orchards, but did not inform MAF as it was unaware commercial pollen imports might be taking place.
 - (v) A situation existed from May 2010 where three separate groups across MAF and Plant & Food independently knew one of the following facts: (i) that Psa could be detected in pollen from infected orchards; (ii) that Psa was present in China; and (iii) that pollen imports from China were taking place for the purpose of artificial pollination of New Zealand orchards. This information was never collated and in June 2010 a further consignment of pollen from China was given biosecurity clearance (MAF has concluded this consignment, which subsequently tested positive for Psa, was never used).
 - (vi) MAF staff were unaware that the Australian Quarantine and Inspection Service reacted to the Italian Psa outbreak by requiring all pollen imports to be tested for Psa. No such testing was put in place in New Zealand.
- (f) MAF's response to concerns about **nursery stock** imports was not sufficiently proactive:
- (i) Too much reliance was placed on the ability to detect Psa on plants imported from Psa-infected regions. Given the severe and irreversible damage that would occur if the quarantine regime should prove fallible, MAF (and the industry) should have been questioning in 2009/10 whether imports of plant material from Psa-infected regions should be halted.
 - (ii) The MAF Plant Imports & Exports Group acted promptly in October 2010 when it learned that the tests being used on kiwifruit plants in quarantine would not reliably detect Psa. MAF agreed with Plant & Food's suggestion to alter environmental conditions in order to maximise the chances of observing any Psa symptoms that might be present and plants that were in quarantine were not released until the additional testing was carried out.
 - (iii) MAF staff failed to consider the possibility of tracing and re-testing those plants that had previously been released from quarantine under the unreliable testing regime.
 - (iv) Had MAF undertaken a formal pest risk assessment for Psa following the Italian outbreak, staff in the Plant Imports and Exports Group might have

learned of the inadequacies with quarantine testing much earlier, as the findings were originally published in February 2010 (note, no plants were released from quarantine between February 2010 and the outbreak of Psa in New Zealand).

The efficacy of border processes

359. Based on the available evidence and discussions with stakeholders we conclude that:
- (a) There were no systematic failings at the border in the implementation of the import requirements for the five risk goods. There were however several significant errors of judgment that unnecessarily increased the risk of a biosecurity breach.
 - (b) The border processes for **nursery stock** imports were largely appropriate, with the notable exception of the decision to release 11 plants from quarantine in 2008 without testing them for Psa.
 - (c) The border processes for **pollen** imports were unsatisfactory:
 - (i) Border staff should not have given biosecurity clearance to a consignment of ‘anthers’ that were imported under a ‘pollen’ import permit from China.
 - (ii) Border staff would not have been able to verify the volumes of imported pollen and therefore could not be sure that all the imported pollen had received the appropriate phytosanitary certification (there is no indication that the pollen did not receive certification).
 - (d) The border process for **kiwifruit** imports failed to detect that imports of gold kiwifruit from Italy were occurring without a valid IHS in place.
 - (e) There were no issues identified with the border processes with the import of **kiwifruit seeds**.
 - (f) There were no issues identified with the border processes with the import of **horticultural equipment**.

Recommendations

360. Many of the issues identified by this paper are situation-specific, such as the granting of border clearance to goods that were not allowed into New Zealand. However, other shortcomings are reflective of systematic issues with how MAF collected and analysed information and engaged with stakeholders. The following recommendations are intended to address these broader concerns.
361. The recommendations arising from this review include:
- (a) MPI needs to look at the relative costs/benefits of **reprioritising its resources** towards managing the risks for economically significant industries.

The consequences of not adequately managing a known risk or not responding appropriately to an emerging risk are heightened for New Zealand’s key

agricultural and horticultural sectors. There may well be net benefits in re-prioritising MPI's resources away from smaller, less strategic industries in order to ensure the risks to higher-value sectors are appropriately managed. While this may well be a controversial development, it may prove to be a more appropriate means of making the best use of MPI's limited resources.

- (b) MPI needs to renew efforts to **centralise the identification and management of emerging risks**, which at present is largely left to the individuals with responsibility for managing particular import pathways.

It is apparent that the horizontal environment scanning undertaken by MAF's Emerging Risk and Opportunities Committee and by the Risk Analysis Team did not elevate consideration of the risks posed by a virulent strain of Psa. MPI needs to revisit the extent to which these activities are appropriately resourced and connected with the teams responsible for managing individual pathways.

MPI should consider allocating key domestic industries to senior staff members and tasking them with responsibility for ensuring the risks to that sector are being appropriately managed across all possible pathways. So instead of the risks to the kiwifruit industry having to be identified and individually managed by those responsible for imports of nursery stock, pollen, fresh fruit imports, seeds-for-sowing, and horticultural equipment, there would be a single point of contact and responsibility for ensuring a systems-wide approach to identifying and acting on emerging risk for the kiwifruit industry.

- (c) MPI needs to **improve the transparency** of when organic matter is being imported into New Zealand for the first time.

Prior to the import of any new organic matter MAF should consult stakeholders on the proposed import requirements; or if the import requirements have previously been specified in an existing Import Health Standard, MAF should issue a notification when the first permit has been issued for a particular type of good.

- (d) MPI should take specific steps to **ensure that the border processes in place for imports of risk goods remain robust**.

Risk goods should only be released from quarantine once the inspection/testing/treatment regime contained within the most recently published Import Health Standard is carried out. The list of regulated pests and testing methods contained within that standard should always supplant any entry conditions that may originally have been in place when the risk goods entered the country.

There are indications that border staff have been unable to detect the difference between closely related risk goods (with 'anthers' assumed to be pollen and gold kiwifruit assumed to be green kiwifruit). While responsibility must also lie with the importers, MPI needs to ensure there is sufficient rigour applied to making sure imported goods are assessed against the relevant import health standard and that border staff have access to appropriate resources and expertise to allow for effective verification of the goods to take place.

- (e) MPI needs to **improve its connectedness** with industry and research organisations.

MPI staff responsible for setting import requirements need a level of awareness of what external research projects are being undertaken that might have implications for New Zealand's biosecurity settings. In the first instance there would be value in regular information exchanges between the MPI Risk Analysis Team and Plant & Food Research to identify all research that is being undertaken and is in the pipeline that may have implications for import requirements. Establishing a more constructive relationship between the two organisations would also assist Plant & Food Research to recognise MPI's priorities and areas where further research would be valuable.

The successful identification of emerging risks is assisted by having effective working relationships with key industry contacts. Both MPI and industry groups need to reflect on whether more can be done to ensure that those staff that are making decisions about the risk profile of an industry are fully informed of the views of the industry on pests of concern.

- (f) MPI should **consider establishing a research fund** that can be used to commission any targeted research needed to better understand a specific area of biosecurity uncertainty.

This review highlighted MPI's dependence on timely access to research being undertaken by external organisations – in this case it was undertaken by Plant & Food Research, but one can expect that industry groups will also often take the lead in researching biosecurity risks. In the case of emerging risks, there may well be instances where MAF would benefit from prompt and targeted research to ensure its standards remain appropriate. Consideration should be given to ability of MPI to commission research to address areas of biosecurity uncertainty in cases where no other organisation has taken the lead.

Appendix 1 – Terms of Reference

BACKGROUND

1. The bacterial disease Psa (*Pseudomonas syringae* pv. *Actinidiae*) was first found in a Te Puke kiwifruit orchard in November 2010. The virulent form of the bacterium which infects kiwifruit vines is known as Psa-V. It is now widespread in the Bay of Plenty and has been confirmed in the Pukekohe area.
2. The impact of Psa-V has been particularly significant on gold kiwifruit vines and less so on green vines. In the Te Puke area many gold kiwifruit orchards have already been cut out and remaining ones are likely to be progressively removed as the disease spreads.
3. The impact of Psa-V on kiwifruit growers and the wider kiwifruit industry continues to grow. The overall impact on individual growers and the regional kiwifruit industry has been dramatic. This will get progressively worse until control tools are developed or new resistant varieties of kiwifruit can be released.
4. MAF and the Industry currently have a partnership for Psa management and control.
5. MAF has recently conducted its own Psa pathway tracing review.
6. In addition, MAF has been undertaking scientific research funded by the industry response management agency, Kiwifruit Vine Holdings (KVH), and coordinated by Zespri.
7. At this stage, there is still considerable uncertainty about the specific pathway by which Psa-V entered New Zealand and was able to reach and infect kiwifruit orchards.
8. Kiwifruit Vine Health Inc (KVH) requested a pollen inquiry.
9. The Director-General of MAF has been requested by the Minister for Primary Industries to undertake this independent review of the Import Health Standards and border clearance processes for kiwifruit pollen, plant material, fruit, nursery stock and horticultural equipment.
10. The independent reviewer, David Moore of Sapere, will report to the Director-General of MAF.

OBJECTIVES

Objectives are as follows:

- To describe the process used to develop and issue the relevant import health standards
- To establish whether the process for developing and issuing the import health standards and associated risk analysis for pollen, plant material, fruit, nursery stock and horticultural equipment and the importation and border clearance processes for pollen, plant material, fruit, nursery stock and horticultural

equipment adequately reflected the available scientific data related to the risks associated with imports of these goods.

- To establish whether the industry was consulted on the proposed import health standards.
- To set out any learning points or possible areas of improvement.
- To set out any other reflections on development of risk analysis, import health standards that might arise from this review.

IN SCOPE

11. The development and update process for the risk analysis and import health standards relating to kiwifruit pollen, plant material, fruit, nursery stock and horticultural equipment.
12. The processes for gathering information and scientific data relating to the risks of importing kiwifruit pollen, plant material, fruit, nursery stock and horticultural equipment.
13. The information and risk analysis that informed the content of the relevant Import Health Standards.
14. The process, information and scientific data used when determining the prioritisation of updates to the relevant Import Health Standards.
15. The biosecurity processes by which kiwifruit pollen, plant material, fruit, nursery stock and horticulture equipment have been imported and given biosecurity clearance including the prioritisation criteria.

OUTSIDE SCOPE

16. The initial investigation into reports of kiwifruit infection (later identified as Psa), the initial response to Psa and the ongoing management or funding of the Psa response.
17. The conduct of MAF's Psa pathway tracing report.
18. The conduct of MAF's pollen testing, on contract to KVH.

OVERALL APPROACH

19. MAF will provide support to the independent reviewer, including compiling the initial pack of information for the independent reviewer, and will maintain a copy of all material provided to the independent reviewer.
20. The independent reviewer will be provided with a copy of supporting documentation and information relating to:
 - the Import Health Standard development process,
 - the risk analysis and data gathering processes and content which supported the relevant Import Health Standards, their development, maintenance and prioritisation,
 - internal or external consultation relating to the risks related to Kiwifruit pollen, fruit, nursery stock and horticultural equipment imports prior to the identification of Psa-V in New Zealand.

21. The independent reviewer may, if necessary, seek relevant information from whomever it sees fit in meeting the Terms of Reference. The independent reviewer will ensure that all information gathered to inform this review is provided to the MAF secretariat.
22. The independent reviewer will consult with KVH and Zespri.
23. The independent reviewer may carry out their review by whatever means to promote the efficient completion of the independent review's function.
24. Remuneration for the independent reviewer and other terms and conditions, such as reimbursement of expenses, will be set out in the letter of appointment.

REPORTING PROCESS

25. The report will be provided in writing to the Director-General setting out its findings no later than 30 April 2012.
26. The independent reviewer may also advise the Director-General on any other matters that come to their attention during the review.
27. During the period of the review the independent reviewer will not enter into dialogue or communicate with anyone within MAF other than the Director-General unless it is at the determination of the independent reviewer.
28. During the period of the review the independent reviewer will not share or communicate information with any party external to MAF without the prior agreement of the Director-General.

Appendix 2 – Schedule of interviews

37 individuals from across the following organisations were interviewed as part of this review:

- MAF
- Plant & Food Research
- Kiwifruit Vine Health
- Zespri
- New Zealand Kiwifruit Growers Incorporated
- Kiwi Pollen
- KSL Services Ltd.
- EastPack
- Seeka Kiwifruit Industries Ltd.
- West Orchards

Appendix 3 – Legal obligations when setting import requirements

The following obligations are central to any exercise of power with respect to establishing, amending, or revoking import requirements for ‘risk goods’

Biosecurity Act 1993

Section 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.

WTO Agreement on The Application Of Sanitary and Phytosanitary Measures (SPS)

Article 2: Basic Rights and Obligations

1. Members have the right to take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health, provided that such measures are not inconsistent with the provisions of this Agreement.
2. Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence, except as provided for in paragraph 7 of Article 5.
3. Members shall ensure that their sanitary and phytosanitary measures do not arbitrarily or unjustifiably discriminate between Members where identical or similar conditions prevail, including between their own territory and that of other Members. Sanitary and phytosanitary measures shall not be applied in a manner which would constitute a disguised restriction on international trade.

4. Sanitary or phytosanitary measures which conform to the relevant provisions of this Agreement shall be presumed to be in accordance with the obligations of the Members under the provisions of GATT 1994 which relate to the use of sanitary or phytosanitary measures, in particular the provisions of Article XX(b) .

...

Article 5: Assessment of Risk and Determination of the Appropriate Level of Sanitary or Phytosanitary Protection

1. Members shall ensure that their sanitary or phytosanitary measures are based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations.
2. In the assessment of risks, Members shall take into account available scientific evidence; relevant processes and production methods; relevant inspection, sampling and testing methods; prevalence of specific diseases or pests; existence of pest- or disease-free areas; relevant ecological and environmental conditions; and quarantine or other treatment.
3. In assessing the risk to animal or plant life or health and determining the measure to be applied for achieving the appropriate level of sanitary or phytosanitary protection from such risk, Members shall take into account as relevant economic factors: the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks.
4. Members should, when determining the appropriate level of sanitary or phytosanitary protection, take into account the objective of minimizing negative trade effects.
5. With the objective of achieving consistency in the application of the concept of appropriate level of sanitary or phytosanitary protection against risks to human life or health, or to animal and plant life or health, each Member shall avoid arbitrary or unjustifiable distinctions in the levels it considers to be appropriate in different situations, if such distinctions result in discrimination or a disguised restriction on international trade. Members shall cooperate in the Committee, in accordance with paragraphs 1, 2 and 3 of Article 12, to develop guidelines to further the practical implementation of this provision. In developing the guidelines, the Committee shall take into account all relevant factors, including the exceptional character of human health risks to which people voluntarily expose themselves.
6. Without prejudice to paragraph 2 of Article 3, when establishing or maintaining sanitary or phytosanitary measures to achieve the appropriate level of sanitary or phytosanitary protection, Members shall ensure that such measures are not more

trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection, taking into account technical and economic feasibility.²⁰⁴

7. In cases where relevant scientific evidence is insufficient, a Member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary or phytosanitary measures applied by other Members. In such circumstances, Members shall seek to obtain the additional information necessary for a more objective assessment of risk and review the sanitary or phytosanitary measure accordingly within a reasonable period of time.
8. When a Member has reason to believe that a specific sanitary or phytosanitary measure introduced or maintained by another Member is constraining, or has the potential to constrain, its exports and the measure is not based on the relevant international standards, guidelines or recommendations, or such standards, guidelines or recommendations do not exist, an explanation of the reasons for such sanitary or phytosanitary measure may be requested and shall be provided by the Member maintaining the measure. To be inserted

²⁰⁴ For purposes of paragraph 6 of Article 5, a measure is not more trade-restrictive than required unless there is another measure, reasonably available taking into account technical and economic feasibility, that achieves the appropriate level of sanitary or phytosanitary protection and is significantly less restrictive to trade.

Appendix 4 – Imports of nursery stock from 2000-2011

Permit Number	Importer	Date of Import	Country of Export	Nature of Consignment	Outcome
2000009879	HortResearch (Plant & Food Research)	Permit never used			
2000009881	HortResearch (Plant & Food Research)	4/11/2000	Australia	C2000/38004 1 carton of <i>Actinidia chinensis</i> budwood	Plants failed to establish and all material was destroyed on 6/6/2002
2001011336	Zespri International Ltd	8/2/2001	China	C2004/58742 120 budwood cuttings of <i>Actinidia chinensis</i>	Tested positive for Apple stem grooving virus. Biosecurity clearance was given for 11 plants on 24/7/2008
2001012971 (issued as a plant products permit)	HortResearch (Plant & Food Research)	28/9/2001	China	C2001/44361 8 budwood cuttings of <i>Actinidia chinensis</i> and 5 budwood cuttings of <i>Actinidia deliciosa</i>	All grafted materials died. All material destroyed on 25/1/2002.
No record of a permit being	Zespri International	3/3/2002	China	C2002/8673	Directed for destruction without being sent to a PEQ facility. All

Permit Number	Importer	Date of Import	Country of Export	Nature of Consignment	Outcome
issued for this consignment	Ltd			12 Budwood cuttings of <i>Actinidia deliciosa</i>	material destroyed on 12/4/2002.
2005026640	HortResearch (Plant & Food Research)	Permit never used			
2006028756	Turners and Growers Limited (Inglis Horticulture was original importer)	7/9/2006	Italy	C2006/214481 12 budwood cuttings of <i>Actinidia deliciosa</i>	9 plants were tested & found free from <i>Pseudomonas syringae pv. Actinidiae</i> using PCR (PAV 1/P 22 primers). Biosecurity clearance was given for 8 plants on 21/12/2007.
2007031379	Kerifresh Ltd	Permit never used			
2007031619	Kerifresh Ltd	20/8/2007	Australia	C2007/215763 8 budwood cuttings of <i>Actinidia chinensis</i>	All material in PEQ destroyed on 12/9/2007 due to poor quality of budwood.
2007032274	Kerifresh Ltd	3/10/2007	Australia	C2007/285730 30 budwood cuttings of <i>Actinidia chinensis</i>	11 plants were tested & found free from <i>Pseudomonas syringae pv. Actinidiae</i> using PCR (PAV 1/P 22 primers). Biosecurity clearance was given to 11 plants on 8/7/2008.

Permit Number	Importer	Date of Import	Country of Export	Nature of Consignment	Outcome
2007032425	Turners and Growers Ltd	Permit never used			
2008033432	Turners and Growers Ltd	Permit never used			
2008033596	Turners and Growers Limited	17/3/2008	Italy	C2008/88846 2,500 tissue cultures of <i>Actinidia deliciosa</i>	8 plants were tested & found free from <i>Pseudomonas syringae pv. Actinidiae</i> using PCR (PAV 1/P 22 primers). Biosecurity clearance was given for 8 plants and 644 tissue cultures (derived from the 8 mother plants that tested free from infection) on 18/6/2009.
2008033616	Turners and Growers Limited	11/4/2008	Greece	C2008/114941 1 budwood cutting of <i>Actinidia deliciosa</i>	All material destroyed in PEQ on 12/5/2008 due to poor quality of budwood
2008033955	ENZA Ltd	Permit never used			
2008034003	Turners and Growers Limited	24/4/2008	Greece	C2008/128599 20 budwood cuttings of <i>Actinidia deliciosa</i>	11 plants were tested & found free from <i>Pseudomonas syringae pv. Actinidiae</i> using PCR (PAV 1/P 22 primers). Biosecurity clearance was given for 11 plants on 13/2/2009.

Permit Number	Importer	Date of Import	Country of Export	Nature of Consignment	Outcome
2008034978	Turners and Growers Limited	4/9/2008	China	C2008/252900 50 budwood cuttings of <i>Actinidia chinensis</i>	11 plants were tested & found free from <i>Pseudomonas syringae pv. Actinidiae</i> using PCR (PAV 1/P 22 primers). Biosecurity clearance was given for 4 plants on 6/8/2009.
2009037912	Consorzio KiwiGold	2/11/2009	Italy	C2009/267488 30 tissue cultures of <i>Actinidia chinensis</i>	All material in PEQ destroyed on 23/12/2009.
2010039010	Consorzio KiwiGold	25/1/2010	Italy	C2010/20873 30 budwood cuttings of <i>Actinidia chinensis</i>	Following a review of PEQ requirements, 18 plants were tested & found free from Psa using PCR (PAV1/P22 primers & F1/R2 primers). Biosecurity clearance given for 18 plants on 4/5/2011
2010039075	Plant & Food Research	13/2/2010	Italy	C2010/42670 2 'lots' imported as budwood from Italy	Following a review of PEQ requirements, both species were tested at least twice & found free from Psa using PCR (both PAV1/P22 primers & F1/R2 primers). Biosecurity clearance given for 1 plant of each species on 11/2/2011.

Appendix 5 – Imports of pollen from 2000-2010

Permit Number	Application submitted	Application approved	New / Renewed Permit	Exported from	Special Conditions	Consignment number
Kiwi Pollen pollen import permits						
2007031028	29 March 2007	16 April 2007	New	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
2007033015	7 December 2007	7 December 2007	New	Exporter name: Chile Valid for 12 months, multiple consignments	As above	Permit not used
2008034955	15 August 2008	15 August 2008	New	Exporter name: Kiwi Pollen Country of origin: Thailand Valid for 12 months, single entry	Pollen is to be inspected for visible signs of contamination.	c2008/261720 1 unit of NZ-origin pollen ex Thailand returned for germination and quality testing

Permit Number	Application submitted	Application approved	New / Renewed Permit	Exported from	Special Conditions	Consignment number
2008035594	3 November 2008	3 November 2008	New	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 2.5kg of pollen
						c2009/67312 Arrived 28/3/2009 26kg of pollen
2009036858	29 April 2009	30 April 2009	Renewal (replaces 2008035594) ²⁰⁵	Exporter name: Bexley Inc Country of origin: China Valid for 12 months, multiple consignments	As above	c2009/140782 Arrived 24/6/2009 4.5kg of anthers

²⁰⁵ This permit for the import of Chinese pollen was recorded as a renewal of a permit for Chilean pollen. MAF advise that this was due to the way the approving officer chose to approve the permit in their database system and it would not have any impact on whether the permit should have been approved. Each permit (regardless of whether a new permit or a renewal) is subsequently peer reviewed before going to a third person for delegated approval.

Permit Number	Application submitted	Application approved	New / Renewed Permit	Exported from	Special Conditions	Consignment number
2009036865	29 April 2009	30 April 2009	New	Exporter name: Apicola Martinez SRL Country of origin: Chile Valid for 12 months, multiple consignments	As above	Permit not used
2009038537	3 November 2009	9 November 2009 ²⁰⁶	New	Exporter name: Apicola Martinez SRL Country of origin: Chile Valid for 12 months, multiple consignments	As above	c2009/296408 Arrived 28/11/2009 99kg of pollen
						c2010/113285 Arrived 30/4/2010 21kg of pollen
2010040083	8 June 2010	9 June 2010	Renewal (replaces)	Exporter name: Bexley Inc	As above	c2010/161762

²⁰⁶ This import permit wrongly recorded that the permit was approved on 9 October 2009, which was confirmed by MAF as mistake. The error was not reflected on the database used at the border for clearing imported goods.

Permit Number	Application submitted	Application approved	New / Renewed Permit	Exported from	Special Conditions	Consignment number
			2009036858)	Country of origin: China Valid for 12 months, multiple consignments (revoked on 12 November 2010)		Arrived 6/6/2010 1kg of pollen

Plant & Food pollen imports permits

2010039375	Unknown	5 March 2010	New	Exporter name: 'various' from Italy, Japan, Korea, China Valid for 12 months, multiple consignments of 1gm pollen samples	<ol style="list-style-type: none"> 1. Must be labelled 2. Must be consigned in secure packaging 3. Must be stored and used at transitional facility in accordance with their procedures 4. Not to be removed without consent of inspector 5. Material remaining after analysis must be incinerated/autoclaved 6. Importer must keep record of all 	c2010/126141 3 vials of Kiwifruit pollen samples arrived from Italy on 13/5/2010
						c2010/22934 1 bag of Kiwifruit pollen from Italy arrived on 23/8/2010

Permit Number	Application submitted	Application approved	New / Renewed Permit	Exported from	Special Conditions	Consignment number
					<p>samples and their current status</p> <p>7. If conditions cannot be met material may be reshipped or destroyed</p>	<p>c2010/272317</p> <p>4 vials of Kiwifruit pollen samples arrived from Italy on 19/9/2010</p>
2010039663	15 April 2010	15 April 2010	New	<p>Exporter name: 'various' from Italy</p> <p>Valid for 12 months, 36 consignments of 5gm pollen samples</p>	Same as above	<p>c2010/114074</p> <p>39 bags of pollen samples from Italy arrived on 1/6/2010</p>
2011042606	Unknown	12 May 2011	Renewal (replaces permit 2010039375)	<p>Exporter name: 'various' from Italy, Japan, Korea, China</p> <p>Valid for 12 months, multiple consignments of 1gm pollen samples</p>	Same as above	<p>C2011/156137</p> <p>1 package of kiwifruit pollen from Italy arrived 13/6/2011</p> <hr/> <p>C2011/218657</p> <p>3 units of kiwifruit pollen (2 packets & 1 vial) from Italy arrived 23/7/2011</p>

Appendix 6 – Imports of kiwifruit seeds from 2000-2010

The following table describes the five consignments of imported kiwifruit seeds from which plants were subsequently grown in quarantine and given biosecurity clearance.

Consignment number	Origin of the seeds	Importer	Date of Biosecurity Clearance	Number of plants released
C2001/42182	China	Plant & Food	June 2009	44 plants
C2006/207115	China	Plant & Food	August 2009	37 plants
C2001/40510	China	Plant & Food	August 2009	132 plants
			Feb 2010	36 plants
			June 2010	15 plants
			August 2010	24 plants
C2006/207140	Nepal	Plant & Food	June 2010	6 plants
C2009/240270	China	Plant & Food	October 2010	30 plants

Appendix 7 – MAF emails on the risks of Psa with fruit imports

The following table documents some of the key emails from 28 September 2010 – 2 November 2010, as concerns began to increase about the risk of Psa entering New Zealand.

The emails are written in light of the decision by Plant & Food in August 2010 to undertake research on the risk of Psa being transmitted through Italian fruit imports.

Email	Relevant Excerpts
28 September 2010, 8:54am Email from Zespri staff member to Plant & Food Senior Scientist	Request made by Zespri for an update on the Plant & Food research. “When can we expect some feedback to report back to MAF on the risk to the NZ industry?”
28 September 2010, 9:52am Email from Plant & Food Senior Scientist to Zespri staff	“About the risk of getting Psa in New Zealand by importing kiwifruit from infected regions, we are making good progress. When fruit are inoculated with Psa, time at 0°C as recommended by MAF is not enough to kill it. In fact it seems that the cold kills the other bacteria which colonised the fruit surface, leaving the place free for Psa to colonise if the conditions would at a later stage get favourable for bacterial multiplication. I am currently in Australia, when I will be back in New Zealand at the end of next week I will send some data which support the point I made above.”
28 September 2010, 9:27pm Email from Zespri staff member to Plant & Food Senior Scientist	“This really alarms me as I read it that fruit is now a possible vector for the transportation of Psa.”
29 September 2010, 12:41pm Email from Zespri staff member to Plant & Food Senior Scientist	“We urgently need more definitive answers on this. MAF are waiting, the NZ industry are seeking confirmation and the import season is about to kick off so fruit will be arriving in NZ. Could you please make it a priority to come back to us by the end of the week with a definitive position on the risks of Psa on <ul style="list-style-type: none"> • fruit • graft wood • pollen As you can appreciate it this is urgent.”

Email	Relevant Excerpts
<p>29 September 2010, 1:58pm</p> <p>Email from Plant & Food Senior Scientist to Zespri staff member</p>	<p>“Follow [sic] are my answers to your questions:</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Hope this helps”</p>
<p>30 September 2010, 8:56am</p> <p>Email from Plant & Food staff member to MAF staff members</p>	<p>The previous email exchange between Zespri and Plant & Food was forwarded to MAF staff.</p> <p>“As previously mentioned [named staff member] is conducting some work to evaluate possible pathways for spread of the disease. He has come to some preliminary conclusions, but unfortunately at this stage he has not had a chance to write a report (this will be drafted in the next week). However, I wanted to alert you to his preliminary findings.”</p>
<p>30 September 2010, 1:30pm</p> <p>Email from MAF staff member to Plant & Food staff member</p>	<p>“Thank you very much for the update. Just wanted to let you know that I will be in Italy next week for a forestry workshop and will be visiting a kiwifruit orchard and a pack house in relation to the interceptions we had last year. However I will not discuss the finding of the report as we may need to make sure that there is a pathway for the Psa on the surface of the fruit to infect the host.</p> <p>We would appreciate if you could send us the draft report so that we could make some comments. While I am away I will be checking my emails. As this could be very close to FB in apples we have following questions and if [named staff member] could answer those it would be great</p> <ul style="list-style-type: none"> • When/how does contamination of the fruit surface occur. • What are its characteristics as an epiphyte, i.e. can it sustain populations on an inert surface. • What disinfection techniques are used currently or are easily

Email	Relevant Excerpts
	<p>available in packing houses, e.g. strong UV light, antibacterial dips.</p> <ul style="list-style-type: none"> • What are the effects of changes in temperature on viability (it seems 0oC has no effect!!) • Is there a genuine transmission mechanism for Psa from the surface of a discarded fruit to a susceptible host. • What is the host range of Psa, what happens to CFU counts as the discarded fruit rots. <p>Thanks”</p>
<p>1 October 2010, 1:12pm</p> <p>Email from MAF staff member to Sr. Maurizio Desantis (Ministerio delle politiche agricole alimentari e forestali, Italy)</p>	<p>Letter sent from MAF to Italian counterpart:</p> <p>“Please be advised that research is currently being conducted in New Zealand, by independent scientists, on the bacterial pathogen <i>Pseudomonas syringae pv. actinidiae</i> known to affect kiwifruits in Italy. The research aims to determine the transmissibility of the pathogen and the risks this may pose to New Zealand via the imported fruit pathway from Italy.</p> <p>MAFBNZ has been advised that the report on the research is expected to be finalised in the next two weeks and early indications show that the fruit could be a carrier of the pathogen. Please be aware that the conclusions of this research may impact on the phytosanitary importing requirements for this commodity from Italy to New Zealand.</p> <p>MAFBNZ will contact you with the finalised conclusions of the research and any revisions to New Zealand’s importing requirements for kiwifruit from Italy by the end of October 2010.”</p>
<p>5 October 2010, 6:05pm</p> <p>Email from Zespri staff member to MAF staff member</p>	<p>I trust your flights to Rome have gone without incident. After our discussion last week, we have received further information from [named staff member] (Plant & Food Research).</p> <ul style="list-style-type: none"> • <i>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.</i> • <i>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.</i> • <i>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 0°C). Therefore fruit do pose a biosecurity risk. (emphasis in original)</i> <p>As you can imagine, this greatly concerns us and our industry. We would respectfully suggest that the border should be closed to Italian imports of all Kiwifruit (knowing that <i>A. chinensis</i> is currently blocked due to the absence of a PRA) pending a full and</p>

Email	Relevant Excerpts
	<p>complete risk analysis around Psa and until such time as this has occurred and the level of risk is well understood, such a closure remains in place.</p> <p>We are mindful that the Italian authorities are making decisions at present regarding restricting exports of at risk fruit (allowing only certified Psa-free fruit to be exported to countries with Psa on their pest lists). We believe that this is, at a minimum, the stance that we should expect for NZ.</p> <p>I would like to discuss this with you as soon as you are able – feel free to call me on my mobile (+64 21 xxx xxx) at your earliest convenience – there are some who wish to elevate this politically, and I would like us to sort this out before such advances are made.”</p>
<p>7 October 2010, 3:47pm</p> <p>Email from MAF staff member to Zespri staff member</p>	<p>“For some reason I received your email only today. [Named staff member], the acting Group manager plant import and export will be taking the necessary actions in realtion [sic] to Psa on fruit. However we need to have the report so that we could inform the Italy [sic] if new measures are required. so far we have informed the importers on possible chnages [sic] to the import requirements [sic]. As soon as we get the report we will be working on it”</p>
<p>14 October 2010, 10:16pm</p> <p>Email from official from Emilia-Romagna region in Italy to MAF staff member</p>	<p>The Italian official forward to MAF the agenda for the 7th International Kiwifruit Symposium, held on 12/13 September as well as an abstract of a scientific paper presented there. That paper concluded that symptomless kiwifruit collected in areas where Psa is known to be present “do not necessarily harbour Psa” either as a contaminant on the surface or within the fruit.²⁰⁷</p>
<p>18 October 2010, 1:58am</p> <p>Email from Zespri staff member to MAF staff member</p>	<p>“Any chance an update on the current position of MAF in response to our requests for border closure for Italian Kiwifruit Imports? I understand that Plant & Food Research have sent a report. We are also aware, indirectly, of some notifications from Italian authorities to Italian producers but nothing formal from MAFBNZ. Look forward to an update (as early as possible as we would like to advise our Board of the current position on Wednesday this week).”</p>
<p>18 October 2010, 3:14pm</p> <p>Email from MAF staff member to Zespri staff member</p>	<p>“We are planning to have a meeting on this Thursday or Friday to discuss MAF intentions in relation to importing kiwifruit from Italy based on recent information on Pseudomonas syringae pv. actinidiae. The meeting will be with Importers, Plant and food and we would like to have a representative from Zespri as well. As you are in Japan can you please let me know who would be best to represent Zespri.”</p>

²⁰⁷ Email from Antoniaci Loredana to MAF staff member, 14 October, 10:16pm

Email	Relevant Excerpts
<p>On Friday 22 October 2010 a meeting was held between MAF, Plant & Food, Zespri and the Fresh Produce Importers Association to discuss the situation with respect to imports of kiwifruit from Italy.</p> <p>1 November 2010, 11:04 am</p> <p>Email from MAF staff member to participants at the workshop</p>	<p>“Thank you for your contribution to the round table discussion on importation of kiwifruit from Italy based on current information on <i>Pseudomonas syringae</i> pv. <i>Actinidia</i> on 22 October. We have agreed to several action items and MAFBNZ would like to form a working group to attend to them. The working group will be led by the Border standards Group [named staff member]. The representatives from other MAFBNZ groups are</p> <p>International Policy: [named staff member] IDC: [named staff members] Risk Analysis: [named staff member] Post Border: [named staff member]</p> <p>Industry: Zespri: [named staff members] Fresh produce Importers: [named staff member]</p> <p>Research Organisations: Plant & Food: [named staff members]</p> <p>The working group will be focusing on following action items</p> <ol style="list-style-type: none"> 1. Conduct a preliminary trial on level of PSA on fruit in a PC2 lab at MAF in collaboration with Plant & Food. This trial will use the laboratory samples imported under an import permit-[named staff members] 2. Provide guidance on research related to presence of Psa on fruit and its transmission to a susceptible host. This will be conducted collaboratively with Plant & Food and MAFBNZ. 3. Develop a contingency plan to resolve the outcome of the research on presence and absence of Psa on fruit and issues related to importation of kiwifruit from Italy 4. Coordinate communication with external stakeholders and trading partners”
<p>2 November 2010, 8:54am</p> <p>Email from Zespri staff member to MAF staff, the Minister for Biosecurity’s Private Secretary and Ministerial Advisor</p>	<p>This email forwarded a copy of ‘Kiwiflier’, the monthly kiwifruit grower newsletter, drawing attention to an articles titled ‘Zespri Working with MAF to Minimise PSA Risk’:</p> <p>“Following the serious impacts facing Italian kiwifruit growers due to the bacterial canker, <i>Pseudomonas syringae</i> pv. <i>actinidiae</i> (PSA), ZESPRI is working closely with New Zealand Kiwifruit Growers Incorporated and the New Zealand Ministry of Agriculture and Forestry (MAF) to minimise the risk of Psa ever reach New Zealand shores”</p> <p>The article noted that MAF was conducting their own research into the risks posted by the import of kiwifruit from Italy and that Zespri was encouraging a voluntary ban on such imports until the risk is scientifically assessed by MAF.</p>

Email	Relevant Excerpts
<p>2 November 2010, 9:33am</p> <p>Email from MAF staff member to the Private Secretary and Ministerial Advisor for the Minister of Biosecurity</p>	<p>A MAF staff member emailed the Minister’s office to provide some background information to the Zespri email noting co-operation on the risks of Psa.</p> <p>The email noted that New Zealand imports close to 1,000 tonnes of kiwifruit each year (with 99% coming from Italy), while New Zealand exports are approximately 350,000 tonnes.</p> <p>The email also noted:</p> <p>“Speaking to a contact at Zespri last week, I was made aware that the Zespri Board requested an industry sub-committee be formed to formulate a response plan to an incursion as there was no planning in place. It was suggested that once formed the inclusion of MAF would be considered.</p> <p>Meanwhile MAFBNZ is doing its own work on understanding PSA as mentioned in the weekly report. To cut the story short, I have provided [named staff member] from BNZ the contact details of the person I spoke to so that the two committees can align their work and not duplicate functions - although on the face of it they are doing different components of a biosecurity strategy.”</p>
<p>2 November 2010, 10:03am</p> <p>Internal email from Group Manager, Pest Management</p>	<p>After being forwarded the above email chain (including the Zespri article) from the Private Secretary for Biosecurity and Animal Welfare, the Group Manager, sent the following to the Private Secretary and relevant staff at the Ministry:</p> <p>“This email is intended as a backstop - to make sure we have connected the dots (which knowing the people involved I anticipate we have):</p> <ul style="list-style-type: none"> • Kiwifruit industry sub-committee being formed to formulate a response plan to an incursion of PSA • GIA interest in joint response preparedness [sic] with industry • MAF-led research on potential risks associated with PSA to NZ kiwifruit industry”
<p>2 November 2010, 11:20am</p> <p>Internal email responding to previous email</p>	<p>In response to above email the Manager, Fresh Produce, stated that a working group had been formed to manage the risks of Psa potentially associated with imported kiwifruit from Italy.</p> <p>This email also noted “[named Zespri staff member] informed me that he is actively working on sub-committee being formed to formulate a response plan to an incursion of PsA and he is a member of border working group too.”</p>

Email	Relevant Excerpts
<p>2 November 2010, 9:41am</p> <p>Email from MAF staff member to official from Emilia-Romagna region, Italy.</p>	<p>In response to a question from an official from the Emilia-Romagna region asking for an update on the Pest Risk Assessment New Zealand was undertaking and the implications for kiwifruit exports the MAF staff member replied stating:</p> <p>“We have not conducted a PRA on PsA yet. There have been some preliminary investigations independently conducted by one of our research organisations [named staff member] on survival of <i>Pseudomonas syringae</i> pv. <i>Actinidia</i>. Since the results of that research are inconclusive we are planning to conduct more research on survival and transmission of PsA. As such it is important for us to know the research on PsA currently conducted by Italy and we will be contacting Italian NPPO to get more information. If you have any info you could share with us on current research on PsA please do let us know.</p> <p>We did not make any changes to the current import import [sic] Health standard (IHS) yet but if there are research results or new information which suggest that fruit could be a pathway we will be amending the IHS.”</p>

Appendix 8 – MAF emails on testing nursery stock imports for Psa

On 13 February 2010, 2 consignments of nursery stock were imported into New Zealand by Plant & Food (under permit 2010039075) and held in a Level 3 Post Entry Quarantine Facility at Plant & Food in Palmerston North.

The emails below concern the decisions whether to clear this consignment from PEQ and one other consignment (30 budwood cuttings of Actinidia imported by Consorzio KiwiGold and held in a Level 3 PEQ facility at ArborGen, Whakatane).

Email	Relevant Excerpts
<p>4 October 2010, 2:58pm</p> <p>Email from MAF Biosecurity Inspector to MAF Adviser - Nursery Stock Imports</p>	<p>“I have a consignment of Actinidia from Italy in PEQ L3 here in PNth. The final inspection is due for this consignment at the end of Oct. All testing is complete and has been negative however, the outbreak of pseudomonas in Italy where this consignment has been sourced could put the spotlight on the potential release of this consignment.</p> <p>Recent literature has shown that without symptoms of Pseudomonas, it is unlikely that PCR will detect presence of pseudomonas. Thus below is the temperature regime Plant & Food have chosen to put the plants through in hope of seeing symptoms if Pseudomonas is present....</p> <p>...[G]iven the situation in Italy is there any likelihood of additional testing etc from your end at this time?”</p> <p>The email noted that the plants were looking healthy during a visual inspection and forwarded a suggested plan by Plant & Food to change the environmental conditions in an effort to accelerate the development of any Psa growth that might be present.</p>
<p>11 October 2010, 12:02pm</p> <p>Internal MAF email from Adviser - Nursery Stock Imports to Manager - Plant and Plant Product Imports</p>	<p>The email was subsequently forwarded to other MAF staff:</p> <p>“The nursery stock was sourced from the area of outbreak in Italy. P&F are concerned that the plants would test negative for the bacteria if the plants were not showing symptoms prior to testing. They have implemented a temperature regime in an attempt to get the plants to an appropriate temperature to exhibit symptoms...</p> <p>We need to decide if the previous PCR testing in combination with the temperature regime (i.e. growing season inspection at appropriate temperature) will be sufficient for detection of Pseudomonas syringae pv actinidiae. It is proposed that the plants are only tested again for Pseudomonas syringae pv actinidiae if symptoms are observed during the next inspection (which will be the last prior to biosecurity clearance.”</p> <p>With respect to the nursery stock at the ArborGen facility, “we need to decide if we should require any measures in addition to PCR testing – i.e. a temperature regime prior to testing for</p>

Email	Relevant Excerpts
	<p>Pseudomonas syringae pv actinidiae.”</p> <p>“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.</p> <p>Initial information from Plant & Food suggests that Pseudomonas syringae pv actinidiae may be pollen transmitted. If this is the case we may need to review the import requirements for Actinidia pollen.”</p>
<p>11 October 2010, 2:06pm</p> <p>Email from Adviser - Nursery Stock to Plant & Food staff member</p>	<p>“As discussed, can you please provide information on the following questions from [named staff member]:</p> <ol style="list-style-type: none"> (1) How the temperature-time regime was determined; (2) “Recent literature has shown that without symptoms of Pseudomonas, it is unlikely that PCR will detect presence of pseudomonas”. Does [sic] you have the paper? (3) Is there any specific information with regards to disease history on the orchard where the actual budwood was sourced from?”
<p>20 October 2010, 11:26am</p> <p>Email from Plant & Food staff member to Adviser - Nursery Stock</p>	<p>The email noted the temperature regime was prepared by Plant & Food staff based on evidence that the spread of Psa is most commonly observed under cool conditions and with rain and high humidity.</p> <p>With reference to the ability of PCR to detect Psa, a Plant & Food staff member noted:</p> <p>“This statement reflects the following quote...</p> <p>‘Unless the sensitivity of the assay can be improved through better DNA extraction or sampling methods, PCR may not be an effective means of screening symptomless tomato seedlings harbouring low number of the target pathogen.’ ...which comes from one of the references in the MAF-IDC Actinidia PEQ Testing manual.” – Cupples, D.A., Louws, F.J., and Ainsworth, T., 2006. ‘Development and evaluation of PRCR-base diagnostic assays for the bacterial speck and bacterial spot pathogens of tomato’ Plant Dis. 90: 451-458.</p> <p>The email also noted that while Psa had been observed in a neighbouring region from where the nursery stock was sourced no disease symptoms were observed at the collection location.</p>

Email	Relevant Excerpts
<p>20 October 2010: 12:34pm</p> <p>Email from Plant & Food Compliance Co-ordinator to MAF staff</p>	<p>“[Plant & Food named staff member] has requested that an independent internal review processes be implemented for all PFR [Plant & Food Research] MAF registered containment facilities holding (or testing for) <i>Pseudomonas syringae</i> pv <i>actinidae</i>. The purpose of this is to ensure that internally we are operating well above the required regulatory levels for PSA work, and to safeguard both our staff and the security of the New Zealand kiwifruit industry....</p> <p>....I am sure you will agree that both MAF and PFR wish to proceed with upmost [sic] caution given the potential significance of this disease.”</p>

As noted in the report, this email exchange subsequently led to a decision by the MAF Chief Technical Officer on 4 November 2010 that the plants should remain in PEQ until a review of the requirements for Psa had been completed. This review was completed in February 2011 and after further testing plants from both consignments were given clearance.