4 July 2011

Office of the Chief Executive
Biosecurity Australia
GPO Box 858
CANBERRA ACT 2601
Australia

Dear ~~Dr~~ Grant Colin

As per the requirements of Biosecurity Australia Advice 2011/06 we are pleased to submit New Zealand's comments on your *Draft report for the non-regulated analysis of existing policy for apples from New Zealand*.

Our submission was prepared by the Ministry of Agriculture and Forestry with inputs from New Zealand scientists and Pipfruit New Zealand inc. It comments on most aspects of the Draft Report and asserts that the only phytosanitary requirement that can be justified technically is that the fruit come from commercial orchards through commercial packing houses.

We thank Biosecurity Australia for the opportunity to comment and look forward to the release of the final report on this issue, the formal Determination and subsequent safe trade in apple fruit from New Zealand. Please contact me direct if you have any questions regarding our comments, we shall be happy to provide whatever additional information might be required.

Best regards

Tim Knox
Director Import & Export Standards
Standards Branch
Ministry of Agriculture and Forestry

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Comments by New Zealand[1]

On Biosecurity Australia's

Draft report for the non-regulated analysis of existing policy for apples from New Zealand, May 2011

Inc. One attachment.

July 2011

[1] A joint submission by the Government of New Zealand, Pipfruit New Zealand Incorporated and New Zealand scientists.

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Comments by New Zealand on the - *Draft report for the non-regulated analysis of existing policy for apples from New Zealand,* May 2011

1. Introduction

1. This document comments on the *Draft Report for the Non-regulated Analysis of Existing Policy for Apples from New Zealand* (the Draft Report), prepared by Biosecurity Australia of the Australian Department of Agriculture, Fisheries and Forestry (DAFF) and published on 5 May 2011. These comments were prepared by the New Zealand Ministry of Agriculture and Forestry (MAF) with input from New Zealand scientists (bacteriologists, plant pathologists and entomologists), and Pipfruit New Zealand Inc. For ease of reference this document follows the structure and format of the Draft Report but omits sections where New Zealand has no comments to make.

2. New Zealand notes the Draft Report's interpretation of the outcomes of the WTO disputes settlement process on this issue.

3. New Zealand acknowledges that the Draft Report is part of Australia's process to bring its measures into compliance with its WTO obligations by 17 August 2011 in accordance with the findings of the WTO Appellate Body in *Australia – Apples*.

4. New Zealand looks forward to the completion of Australia's review process, to discussing the work plan (compliance programme in New Zealand's terminology) and the issuance of the first Import Permits for New Zealand apples based on conditions that are technically justified.

5. New Zealand notes the reference in the Draft Report[2] to the separate powers that Australian states have in regulating the interstate movement of plants and their products. New Zealand is concerned that this reference foreshadows the possibility that some states may seek to prohibit the entry of New Zealand apples despite the findings of the Appellate Body and Biosecurity Australia's anticipated final review of policy on the three pests of concern (i.e. the final version of the document being considered here). New Zealand expects DAFF to use its good offices to ensure that the states are aware of Australia's obligation to bring its measures for New Zealand apples into compliance with the WTO SPS Agreement by 17 August 2011.

6. New Zealand acknowledges this opportunity to examine the process, science and analysis presented in the Draft Report. New Zealand will comment on areas where it believes the process and the interpretation of the science are not-transparent and/or erroneous, and provide new information where that presented is outdated or incorrect.[3]

7. New Zealand notes that cooperation between the New Zealand and Australian apple and pear industries has been ongoing for some time through joint research projects and more recently the joint venture for the production of elite New Zealand

[2] See Page 3. under Domestic Arrangements.
[3] The absence of any comment on any part of the Draft Report should not be taken as an indication that New Zealand agrees with or accepts the truth of statements contained in such parts of the Draft Report.

pipfruit varieties in Australia. This cooperation provides a sound basis for moving forward to the benefit of both industries and consumers once New Zealand apples are able to be exported to Australia, for example, through marketing efforts to increase apple consumption per head in Australia.

2. Method for pest risk analysis

8. New Zealand acknowledges that "None of the three pests considered are present in any part of Australia".[4] Two of the pests have, however, been present at earlier times (fire blight in Melbourne Botanical Gardens and European canker in Tasmania) and are now considered to be eradicated.

9. New Zealand notes that under the discussion of the process for assessing the probability of establishment and of spread, "expert judgement" is stated to have been used to assess these probabilities. However, no further detail is provided here or elsewhere in the Draft Report describing how this "expert judgement" was elicited. New Zealand notes the Panel finding in *Australia – Apples* that the use of expert judgement "must be documented and transparent".[5] It also notes the Appellate Body's agreement "that the IRA should have explained how it arrived at the expert judgements it made at intermediate steps".[6]

10. New Zealand also notes that the Draft Report uses an estimated volume of trade of up to 20% of the domestic fresh apple fruit market.[7] This is one third higher than the 15% used by the 2006 Import Risk Analysis but no explanation has been provided for this higher value.

11. The recent Australian Centre for International Economics (CIE) Report "*Adjusting to apple imports Part 2: Economic Impact Statement*" (CIE 2010) estimates the market share of **all** new apple imports (i.e. from New Zealand, China and the USA) will peak at around 22% by 2014. The CIE Report (CIE 2010) does not identify the share that each source of apples might attain.

12. Irrespective of this, in New Zealand's view, even the 2006 IRA estimate of 15% share of the market is too high. Neither the 20% nor the 15% estimates has taken into account that currently all Australian domestic demand for apples is supplied from local sources and that local supermarkets tend to provide support for Australian-grown produce. Further, most of the apple varieties currently favoured by Australian consumers are produced only in limited quantities in New Zealand.

13. New Zealand also notes that any attempt by New Zealand to capture a large market share in Australia would be counterproductive as it would lead to a large fall in prices, quickly making exports uneconomic. Finally, New Zealand argues that supply-side constraints in New Zealand would also limit the number of fresh apples that could be exported to Australia, because our exporters are committed to long-term contracts with Northern Hemisphere customers. That is, in order to induce New Zealand exporters to divert a substantial part of their exports to the Australian market, prices in that market would need to remain high. As a consequence the fall in

[4] Draft Report Page 5. under Stage 1: Initiation
[5] See WTO Panel Report, for example at paragraph 7.440.
[6] WTO Appellate Body Report at paragraph 248.
[7] Draft Report Page 10.

Australian market prices is unlikely to be as severe as predicted by the CIE Report (CIE 2010).

14. As explained in 2005 (MAF 2005) New Zealand asserts that 50 million apples per year or 5% of the Australian domestic fresh apple fruit market is the most likely value for the volume of New Zealand apples that may be exported to Australia.

3. New Zealand's commercial production practices for apples

15. New Zealand confirms that the "*NZ Pipfruit-IFP Manual*" contains some proprietary information that cannot be publically released. However, the chapters on the three pests of concern to the Draft Report (*viz*. fire blight, European canker and apple leafcurling midge) are not restricted. In fact these chapters were supplied to Biosecurity Australia in early 2006 with the express understanding that they could be publically released.

16. On Page 22 the Draft Report mentions the use of the antibiotic streptomycin to manage fire blight in New Zealand. In view of the controversy surrounding the use of antibiotics in agriculture New Zealand wishes to point out that streptomycin is the only antibiotic registered for use to manage fire blight in New Zealand orchards.

17. Streptomycin is applied only at blossom time and consequently there are no residues on exported fruit. Also as pointed out in the Draft Report and the recent Food Safety Australia New Zealand report on the issue (FSANZ 2011), its actual use is very limited (<5% of orchards in 2009-10). New Zealand requests that these points be made clear in the final version of this report.

18. Under section 3.4.1, Packing Houses, the Draft Report mentions the use of an Independent Verification Agency (IVA) to verify spray diaries. New Zealand points out that MAF has no involvement in this process as it is being done for commercial reasons to ensure the fruit meets consumer requirements for residues. While one of the independent agents carrying out this work (AsureQuality) is an IVA, in this role they are industry approved rather than MAF approved, consequently it is better to use the term "industry approved agent".

19. As regards maturity testing at the packhouse gate (point of receival[8]) New Zealand points out that the tests performed are done to determine not only maturity but also quality and storability. With regards to verifying the irreversible onset of the conversion of starch to sugar the only test for maturity needed is the starch pattern index test.

20. Please note: the period of time apples are exposed to the high pressure water washer is more likely to be 15 seconds rather than the 30 – 60 seconds described by

[8] Term created by the Draft Report Page 25 under 3.4.1, meaning the place at which the fruit enters, or is received, at the packhouse.

the Draft Report, but the outcome is the same; all contaminating materials are removed from the apples.

21. The words '"dropped" onto' in the sentence "After grading, all packing houses were observed to utilise a conveyor system that carried apples to the appropriate packing line where apples were "dropped" onto the appropriate packer's table" on page 26 imply rough handling in the packing line which is far from the case. New Zealand requests that they be replaced with 'delivered to'.

4. Pest risk assessments for quarantine pests

4.1. FIRE BLIGHT

22. *Page 31, third bullet point*: the figures presented, while being numerically correct, provide a misleading view of the status of fire blight in New Zealand. In the 1990's Japan required there to be zero detections of fire blight symptoms in the whole designated export area which included the whole orchard plus the 0.5km buffer zone around it, i.e. for each orchard a single fire blight symptom would exclude a very large area indeed.

23. What the numbers show is that, even to this severe standard, after three inspections in the 1994–95 growing season 43.2% of orchards in Hawke's Bay, 36.9% in Nelson, 51.2% in Blenheim and 75.5% in Canterbury were free of fire blight symptoms. In the 1995–96 season 45.9% of orchards in Nelson and 83.9% in Blenheim were free of fire blight symptoms, and in the 1996–97 season, 89.8% of orchards in Blenheim were free of fire blight symptoms. The decline in the number of regions inspected each year is a result of the low profitability of exports to Japan under the conditions at that time and the reason exports stopped in 1997.

24. Thus rather than saying that fire blight was widespread in New Zealand in the 1990s, it is more correct to say that a low incidence of fire blight symptoms could be detected in some regions of New Zealand in the 1990s.

25. **Probability of importation**: New Zealand challenges the assessment of a 'moderate' likelihood that *Erwinia amylovora* will arrive in Australia with trade in fresh apples for consumption from New Zealand. Table 2.1 of the Draft Report defines 'moderate' as "The event would occur with even probability"; or in other words every second apple is contaminated with at least one bacterium. New Zealand asserts that based on the evidence provided on pages 30 – 48 of the Draft Report this assessment is unsustainable and a likelihood of 'Extremely Low' is more probable. For example, on page 58 (second paragraph of the conclusion) the Draft Report concludes "*Erwinia amylovora* is likely to be present in a viable state in the calyx in low numbers, and in only a small proportion of imported apples." This is not an even probability.

26. Further, in summary, pages 30 – 48 of the Draft Report conclude:

1. The cultural control and other measures used in the industry integrated fruit production programme have reduced the level of orchard infection to very low levels.
2. Only a small proportion of orchards have sufficient fire blight symptoms in or near to warrant prophylactic sprays.

3. There is no evidence of infection of mature fruit under natural conditions, i.e. a negligible likelihood.
4. *E. amylovora* is a very poor epiphyte and does not multiply on the surface of fruit or leaves and is susceptible to UV radiation, moisture and antagonistic microorganisms.
5. The number of colony forming units (CFU) of *E. amylovora* on the surface of fresh apples (including in the calyx) is in continuous decline from the moment of fruit initiation.
6. In the unlikely event that fruit were exposed to *E. amylovora* bacteria from a late outbreak of fire blight these bacteria would only be on the skin of the fruit, they will not get into the calyx and will be in continuous decline from the moment they are deposited.
7. The number of CFU of *E. amylovora* on the calyx continues to decline after harvest, even during cold storage.
8. Mechanisms suspected to modify the above conclusions, e.g. the viable but non-culturable state, exopolysaccharides and biofilms, quorum sensing and sigma factor, have not been demonstrated to have any detectable impact on numbers of CFU (BA 2011).
9. The likelihood that viable epiphytic bacteria occur on the leaves and the surface of mature fruit at the time of apple picking is very low.
10. High pressure water washers in the packhouse remove most contaminating trash, dried up leaf and twig material, from the consignment of apples. Be that as it may, such trash is unlikely to contain populations of *E. amylovora* and has never been shown to be a pathway for the entry, establishment and spread of *E. amylovora*.
11. The likelihood of transfer of bacteria to clean fruit during picking and transport is extremely low. Any epiphytic bacteria that do contaminate the fruit surface will only survive for a very short period.
12. In cold storage experiments using apples with calyces infested with populations of *E. amylovora*, similar to those that would naturally occur on harvested fruit, the numbers of CFU decreased to undetectable levels after a relatively short period of time.

27. New Zealand asserts the above facts demonstrate that the likelihood that a New Zealand apple arriving in Australia is infested with at least one *E. amylovora* bacterium is at most ‘Extremely low’.

28. This conclusion is valid without orchard sprays to manage fire blight infections and without packing house disinfection of the fruit.

29. **Probability of distribution**: New Zealand challenges the assessment of an ‘extremely low’ likelihood that *E. amylovora* will be distributed in a viable state within Australia on fresh apples for consumption from New Zealand and subsequently transferred to a suitable host. New Zealand asserts that based on the evidence provided on pages 48 - 58 of the Draft Report this assessment is unsustainable and a likelihood of ‘Negligible’ is more probable.

30. In summary, pages 48 – 58 of the Draft Report conclude:

    1. The extremely low number of CFU on the calyx of a very small number of infested apple fruit arriving in Australia will continue to decline including: while in cold storage; while being transported; while on retail shelves; while being packed/repacked in rural packhouses (an unlikely scenario); and after being placed in compost or waste heaps or after being "thrown from a car window".
    2. Hosts of *E. amylovora* are found in many parts of Australia particularly in home gardens and apple and pear orchards, but host susceptibility is variable by species and over time. Blossom (the most susceptible infection site) will primarily only be available in spring, six months after the importation of the main volume of apples from New Zealand and few, if any, New Zealand apples will be available anywhere in the country at that time.
    3. By the time of disposal to the environment the majority of the small number of CFU in the calyx would not be viable and those remaining would be in an attenuated state due to the adverse conditions in the calyx.
    4. The tiny number of bacteria remaining in the calyx of a waste apple would continue to be exposed to adverse environmental conditions, including antagonistic microorganisms, which further decrease the number of viable bacteria.
    5. The multiplication of *E. amylovora* on apple waste has been demonstrated not to occur and there is no evidence to suggest that this can occur.
    6. In the absence of supporting evidence, the likelihood of development of bacterial ooze on discarded apple waste is considered to be negligible
    7. This is further supported by experiments conducted on apples discarded in an apple orchard that showed that bacterial populations were in a continuous state of decline and did not multiply on decaying apples. Fruit blight symptoms and bacterial ooze did not develop on the discarded infested apples (Taylor *et al.* 2003).
    8. With regards to Taylor *et al.* (2003) New Zealand wishes to clarify that: 1) the strain of *E. amylovora* used was not a genetically marked strain but a stable, spontaneously derived mutant that had rifampicin and nalidixic acid resistance; and 2) while the study did not use damaged apples the fruit did go through a decay process, hastened by bird attack, that attracted considerable insect activity.
    9. Survival in soil is not considered to be epidemiologically significant.
    10. The vanishingly small number of bacteria that may be present in the calyx of a tiny number of apples imported from New Zealand and disposed of near a susceptible host will be in an attenuated state and likely incapable of producing exopolysaccharides that could stick them to a potential vector.
    11. Rotting fruit is not a suitable source of nutrients to enable the multiplication of *E. amylovora* in fact such fruit is a hostile environment for *E. amylovora* because of the presence of antagonistic microorganisms, including, in Australia, a saprophytic *Erwinia* species closely related to *E. amylovora* (Sosnowski *et al.* 2009).

12. For the transfer scenario described in the Draft Report to work it is necessary to assume that potential vectors can be contaminated with *E. amylovora* from the CFUs in the discarded calyx something that has never been observed and which the Draft Report itself considers highly improbable.

13. *E. amylovora* was first described in 1882 and has been studied intensively by bacteriologists and others for 130 years. During that period while scientists have described primary and secondary mechanisms for infection no one has identified an infection pathway from discarded fruit to any susceptible host plant despite considerable speculation and many attempts.

14. Infection requires sufficient numbers of bacteria arriving on a host while it is susceptible and the climate is suitable (the disease triangle). Each of these is essential for infection yet we have seen that the first has a negligible likelihood of occurring and the others vary independently through the year. The likelihood that all three would coincide in Australia from bacteria on discarded New Zealand apples is so small it cannot be differentiated from zero.

31. New Zealand asserts the above facts demonstrate that the likelihood that *E. amylovora* will be distributed in a viable state within Australia on fresh apples for consumption from New Zealand and subsequently transferred to a suitable host <u>'Negligible'</u>

32. **Overall probability of entry**: the combination of the probability of importation (extremely low) with the probability of distribution (negligible) delivers an overall probability of entry of **NEGLIGIBLE**.[9]

33. New Zealand asserts that the above demonstrates that the likelihood that the suggested pathway of transferring fire blight from New Zealand to Australia on fresh apple fruit can be completed is so small it cannot be differentiated from zero, consequently further risk analysis is unnecessary <u>and phytosanitary measures are not technically justified.</u>

34. **Probability of establishment**: New Zealand acknowledges that if an infection of *E. amylovora* were to occur somewhere in Australia where the climate is suitable it is probable that this could lead to a longer term infection that will result in the completion of the pathogen lifecycle on host plants through an entire year. The strength of this probability is, however, dependant on several factors most notably the climate of the area in which the initial incursion took place and the availability of susceptible hosts in the vicinity.

35. New Zealand points out that in the incursion in the Melbourne Botanical Gardens fire blight symptoms were observed only on two plants, one *Cotoneaster* and one *Sorbus* (Rodoni *et al.* 1999). Both these species are highly susceptible to *E. amylovora* infection (BA 2006).

[9] The word 'negligible' is part of the language of the Draft Report and the Australian import risk analysis system but in this instance it does not do justice to the likelihood estimate that is so low it cannot be differentiated from zero.

36. Considering the evidence above concerning the likelihood of an infection occurring it is hard to imagine that the two plants were infected simultaneously. That being so it is probable that the infection began in one and moved to the other following the production of ooze over a period of months if not years.

37. It is therefore probable that the incursion in the Melbourne Botanical Gardens likely began at least the year before it was noticed. Considering the scale of the movements of people and plants into Australia over the past 200+ years, much of it unrestricted in the early years, it would be surprising if this was the only time that a pioneer fire blight infection has occurred, yet this is the only time one has been reported. This suggests that the climate of large parts of Australia is not amenable to the establishment of *E. amylovora* and even where a pioneer infection occurs it struggles to persist.

38. As mentioned above the likelihood of establishment is dependent on the climate of the area in which the initial incursion (a highly unlikely event via discarded apples) takes place and the availability of susceptible hosts in the vicinity. New Zealand therefore asserts that the likelihood of establishment is 'Moderate' rather than 'High'.

39. **Probability of spread**: It is salutary that the fire blight incursion in the Melbourne Botanical Gardens, where the climate is at least partially amenable to fire blight, likely occurred at least one year before it was noticed yet it only spread to one other plant in that time. This provides additional evidence that spread of fire blight is dependent on the climate of the area in which the initial incursion takes place and the availability of susceptible hosts in the vicinity.

40. New Zealand does not dispute that if an incursion occurred in a pear orchard in, for example, the Goldburn valley it is probable that it would spread from the initial tree into the rest of the orchard over a period of time. However, the evidence from the Melbourne Botanical Gardens incursion suggests that spread into other orchards or areas will be considerably slower and dependent on the climate of the area in which the pioneer incursion takes place and the availability of susceptible hosts in the vicinity.

41. New Zealand asserts that the scenario of a New Zealand apple (even the more common scenario of one free of *E. amylovora*) being discarded within an apple or pear orchard within Australia's premier apple and pear production area is highly speculative. It is fair to say the disposal of an apple heavily infested with *E. amylovora* in a Goldburn valley apple or pear orchard is an "event that would almost certainly not occur." The only plausible scenario for the introduction of fire blight into an Australian an apple or pear orchard is via nursery stock.

42. New Zealand agrees that apple growing regions of Australia have differing climatic conditions and are separated by long distances, including desert areas between some states. There is potential for spread within orchards and between adjacent orchards but spread between production areas would be slower and depend on movement of infected plants, not apple fruit.

43. This of course is unrestricted movement. It is hard to imagine such a situation ever occurring in Australia because as soon as the first symptoms were reported an eradication programme would be initiated and the movement of all nursery stock out of the infected area would be prohibited. Considering all the above New Zealand asserts that the likelihood of spread should be estimated as 'Moderate' rather than 'High'.

44. **Overall probability of entry establishment and spread (PEES):** New Zealand's estimate for PEES for *E. amylovora* is given in the table below.

Importation	Distribution	Entry	Establishment	Spread	PEES*
Extremely low	Negligible	Negligible	Moderate	Moderate	Negligible

*Probability of entry, establishment and spread.

45. This being so New Zealand re-asserts that the pathway is incomplete, that consequently further risk analysis is unnecessary and phytosanitary measures are not technically justified.

46. For completeness New Zealand will continue to provide comment on the risk analysis despite the above contention.

47. **Consequences**: New Zealand disputes the estimate that the consequences of the entry establishment and spread of *E. amylovora* in Australia are 'High'. This estimate is dependant on a single criterion of the overall consequences being "F" – significant at the national level.

48. Australia has one of the world's strongest national economies; this has been highlighted in recent years by its ability to withstand a number of internal and external events, including a major drought, a housing boom, the Asian financial and economic crises and the recent floods in Queensland. Australia's gross domestic product (GDP) in 2007 (in value terms) was around $1 trillion. (DFAT website 2008)[10].

49. Many of the papers relied upon by the Draft Report to provide estimates of financial losses following establishment of *E. amylovora* in Australia use as a basis for their discussion a paper by Roberts (1991). This paper suggests that the impacts in the worst affected areas will be above 20 per cent and 50 per cent in apples and pears respectively, annually. During the WTO Dispute settlement proceedings in 2010 Dr. Paulin (Paulin 2010) pointed out that these estimates are at odds with the New Zealand and worldwide experience.

50. The doubtful validity of the Roberts (1991) paper throws into doubt all the estimates developed by most of the papers referred to in the Draft Report. Be that as it may the most recent paper referred to by the Draft Report asserts that the financial consequences of *E. amylovora* in Australia could be in the range of $33 to $95 million per year depending on the model used to estimate consequences and the confidence assigned to those estimates (Cooke et al. 2009).

51. Despite these disputed assumptions Wittwer (2004) indicates that real GDP of the Goulburn Valley will decline by at most 0.75 and 1.5% relative to what it would have been in the absence of fire blight; with real consumption declining between 0.4% and a little over 0.7% relative the situation without fire blight.

52. Thus the impact of a fire blight outbreak even in the heart of Australia's apple and pear industry is likely to be "minor". **Note:** these losses were calculated for the district likely to be most severely affected by a fire blight incursion should one ever

[10] http://www.dfat.gov.au/facts/global_economy.html accessed 18 May 2011.

occur there. Given that much Australia's pipfruit is concentrated in this one area (18% of Australian apple production and 86% of Australian pear production) the impact on other areas is unlikely to be discernable.

53. Even with these worst case scenarios of full establishment after a failed eradication campaign, while the consequences for the apple and pear industry will be important they cannot be considered significant nationally. In New Zealand the last fire blight outbreak in 1998 was significant only in Hawkes Bay and losses of approximately 10% were reported there (Vannesete 2000).

54. New Zealand asserts that at most the consequences at the national level will be of minor significance and therefore the estimate of overall consequences should be at most 'Moderate'.

55. **Unrestricted risk estimate**: Based on the above discussion. New Zealand asserts the estimate of unrestricted risk should be as given in the table below.

Unrestricted risk estimate for *Erwinia amylovora*	
Overall probability of entry, establishment and spread	Negligible
Consequences	Moderate
Unrestricted risk	**Negligible**

56. New Zealand asserts that fresh apple fruit are not a pathway for the entry, establishment and spread of *Erwinia amylovora* and therefore no risk management measures are technically justified.

4.2. APPLE LEAFCURLING MIDGE

57. *Probability of importation*: New Zealand challenges the Draft Report's estimate of likelihood of importation of *Dasineura mali* as 'Moderate'. According to Table 2.1 of the Draft Report a 'Moderate' likelihood is an event that would occur with an even probability, i.e. every second apple. The facts as presented in the Draft Report do not support such a conclusion because:

- Rogers *et al*. (2006) state that *D. mali* activity and significance as a pest declined following the introduction of the industry integrated fruit production (IFP) programme to the apple sector through the mid to late 1990's.
- *D. mali* primarily pupates in the ground, but occasionally mature larvae may spin cocoons and pupate on fruit (Tomkins 1998; HortResearch 1999).
- Contamination of fruit by pupae is considered incidental, occurring when mature larvae exiting leaf rolls get caught around the stem or calyx of fruit when attempting to drop to the ground.
- By harvest time (February onwards), generations 1-2 and most of generation 3 will have emerged (but the empty cocoons from earlier generations will be left

at the pupation site, including the small number that spin a cocoon on fruit). The last generation before winter will not have had time to emerge by harvest.

- This fourth generation, which could be present as well developed larvae and pupae, has a parasitism rate of 58 per cent (Shaw *et al.* 2005). The rare fifth generation mentioned by Shaw *et al.* (2005) has a parasitism rate of 80 per cent.
- All prior generations will have emerged so many cocoons on apples will be empty and of those that are occupied many are parasitised.
- Data from 2001–2004 from endpoint inspections for the US market indicated average fruit contamination levels ranging from 0.10 per cent to 0.38 per cent, with an average across all years of 0.16 per cent (Pipfruit NZ 2005).
- The presence of cocoons on fruit is not a reliable indicator that live *D. mali* are present. *D. mali* pupae may have already completed development and emerged, resulting in empty cocoons, or pupae may have been killed due to parasitism or other factors.
- The Draft Report itself has adopted an upper limit to the number of cocoons containing viable pupae in the range of 30 to 50 per cent.

58. New Zealand recognises that there is potential for *D. mali* to be imported with New Zealand apples, though not with certainty in all consignments or in all years and most certainly not on every second apple. New Zealand asserts that the probability that viable *D. mali* would be imported into Australia should be assigned a risk rating of 'Low' at most.

59. **Probability of distribution**: The Draft Report is in error in claiming that on-arrival inspection procedures do not include any inspection of fruit. Whether it is done as a part of a voluntary programme of AQIS inspections in New Zealand or as part of the normal AQIS inspections in Australia there will undoubtedly be inspection of fruit "on-arrival" just as AQIS does with all imported plant materials. Even with low levels of infestation some interceptions of pests will occur and these consignments will always be treated, reshipped or destroyed. As a consequence the numbers of *D. mali* arriving in Australia will be reduced by "on-arrival" phytosanitary inspection.

60. New Zealand disputes the relevance and likelihood of packing or repacking of fruit by orchard wholesalers. The frequency of exports of apples in bulk bins is very low and currently done only for specific market needs in Europe. Such needs are not thought to be relevant in a market as close as Australia which can be supplied quickly in any format from stocks on-hand in New Zealand.

61. Even if small quantities of fruit were packed or repacked in orchard wholesalers the quantities of fruit requiring disposal will be very small. Then, because of the staggered emergence of *D. mali* over time the numbers of adult *D. mali* that could emerge simultaneously before the disposed of fruit was covered by earth or other trash would be extremely small. The likelihood of a mating pair emerging within 2-3 days of each other near susceptible hosts is negligible.

62. Similarly the likelihood of significant quantities of apples infested with viable cocoons remaining unused overwinter in cold storage and being disposed of in large numbers near apple plants in spring is negligible.

63. The disposal of individual fruits along the roadside or anywhere else can be disregarded as the likelihood of a mating pair emerging from a single discarded fruit near a susceptible apple tree is negligible.

64. A flight range of 30m has been measured for males and up to 200m is not thought to be unreasonable (Cross 2010). However, it needs to be stressed that these distances are straight line distances to a source of an attractant; female pheromones for males and young leaves for mated females. For this to be useful the male or female must be down wind of what they are looking for otherwise they will undoubtedly exceed their maximum flight distance (even 200m) while they search for a source of attractant. This latter scenario is likely to be the situation for three quarters of all emerging midges, i.e. they will not be directly downwind of an attractant.

65. In light of:

- The short adult life span (< 2 days in the field (Cross 2010));
- The prolonged emergence period (due to the range of ages of the larvae and pupae in cocoons on harvested fruit); and
- The likelihood that disposed of fruit would be covered by earth or other waste within a few days of dumping.

Even if "very large quantities" (BA 2011) of New Zealand apples were disposed of near apple orchards while there were young leaves available for egg laying (essentially only in spring, 6 months after harvest in New Zealand) the likelihood of a male and female emerging, locating each other, mating and laying eggs is negligible.

66. In summary, for *D. mali* to be distributed within Australia and result in eggs being laid on a young leaf on an apple tree, any midges entering Australia as pupae would need to survive until emergence, be in sufficient proximity to both a host plant and an individual of the opposite sex within a very limited window of opportunity.
New Zealand asserts that this specific sequence of events would be very unlikely to occur following the importation of New Zealand apples and therefore the likelihood that *D. mali* will be distributed within Australia in a viable state should be assessed as "negligible".

67. **Probability of establishment**: Any *D. mali* emerging in Australia would only have the potential to lay eggs and establish a founding population in a specific seasonal window, i.e. when young leaves were available, and in one of the few areas of Australia where the climate is suitable for establishment. Such areas might include Tasmania, parts of Victoria and New South Wales. New Zealand considers as speculative the mention in the Draft Report that the climate of Stanthorpe in Queensland and Batlow in New South Wales might be suitable.

68. If mate location, mating and egg laying in spring did occur it is possible, though not certain, that a population could establish and persist into the foreseeable future in these restricted areas and New Zealand agrees this supports a risk rating of "moderate" in restricted these areas.

69. **Probability of spread**: New Zealand agrees that if *Dasineura mali* did establish in one of the restricted areas where climate is suitable and hosts are available then spread within that area, for example between adjacent orchards, is probable and supports a risk rating of "moderate".

70. New Zealand asserts that the likelihood of *D. mali* establishing in urban areas is negligible for all the reasons mentioned above and discussion of this possibility is futile.

71. However, spread between geographical areas even if the climate is suitable is only likely following the movement of nursery stock as experienced elsewhere in the world; not through the movement of fruit.

72. **Overall probability of entry, establishment and spread (PEES):** Using the matrix of rules as per Table 2.2 of the Draft Report New Zealand asserts that the likelihood that *D. mali* will enter Australia by the pathways discussed, be distributed in a viable state to susceptible hosts, establish in that area and subsequently spread within Australia should be assessed as: **NEGLIGIBLE** as set out below.

Importation	Distribution	Entry	Establishment	Spread	PEES*
Low	Negligible	Negligible	Moderate	Moderate	Negligible

*Probability of entry, establishment and spread.

73. **Consequences:** New Zealand challenges the Draft Report's assessment of "Low" for the overall consequences of the entry, establishment and spread of *D. mali* and suggests that an assessment of "**VERY LOW**" is more appropriate.

74. *Direct impact on plant life or health*: New Zealand estimates that the consequences for direct impact on plant life or health might be significant at the local level and of minor significance at the district level warranting an impact score of 'C'. If *D. mali* established anywhere its effects on young leaves will be immediately obvious as something new and unusual and consequently reported to the authorities quickly. This being so it is likely that an eradication programme would be put in place quickly and because of this likely to be successful.

75. Control methods for *D. mali* are now well known and documented. It is likely that several insecticides already used in Australian orchards will be effective against *D. mali*. If necessary, however, appropriate pesticides could be given provisional or emergency registration while new control regimes were established and full registration was processed.

76. The main impact of *D. mali* is in nurseries and on recently planted trees where pesticide use is not a problem as no apple fruit are present. Older, bearing trees are able to withstand considerable damage before yield is affected (Antonelli and Glass 2005).

77. As the Draft Report mentions several general predators of insects on leaves such as earwigs are already present in Australian apple orchards and will have an impact on *D. mali* numbers. If needed the parasitoid wasp, *Playgaster demades*, could be imported from New Zealand or Europe[11] and with careful management of pesticides this is likely to establish and be at least as effective as it is elsewhere.

78. Thus any impact is likely to remain local and pose no significant management issues.

79. *Eradication, control etc.*: New Zealand estimates that the consequences for eradication and control may be significant at the local level only and warrant an impact score of 'C'. If *D. mali* established anywhere its effects on young leaves will be immediately obvious as something new and unusual and consequently reported to the authorities quickly. This being so it is likely that an eradication programme would be put in place quickly and because of this likely to be successful.

[11] Albeit the process of obtaining permission to do this can be slow. However, worldwide experience with *Playgaster demades* shows it to be host specific and therefore likely to pass biosecurity scrutiny quickly.

80. Control methods for *D. mali* are now well known and documented. If necessary appropriate pesticides could be given provisional or emergency registration while new control regimes were established and full registration was processed. New integrated pest management regimes, based on the New Zealand model, could be implemented quite quickly.

81. Mature apple trees can withstand considerable damage from *D. mali* without loss of yield (Antonelli and Glass 2005). Thus, while there may be some increase in the use of carefully chosen, selective pesticides this would not be expected to add substantially to orchard costs.

82. *Domestic trade*: New Zealand estimates that the consequences for domestic trade might only be of minor significance at the local level and warrant an impact score of 'B'. As described above the likelihood of entry, establishment and spread of *D. mali* following trade in apple fruit is negligible, consequently restrictions on the inter or intra state movement of apple fruit are not technically justified.

83. Only control over the inter or intra state movement of nursery stock can be justified and this could readily be made safe by ensuring the stock are free of soil and have been treated with insecticide at minimal cost.

84. *International trade*: New Zealand estimates that the consequences for international trade would only be indiscernible 'A'. As the Draft Report points out more than 64% of New Zealand's total apple production is exported as fresh fruit; the remainder is either processed or consumed fresh domestically. The export fruit is sent to over 65 countries worldwide and none have banned New Zealand fruit.

85. *D. mali* is a specified quarantine pest for China, Taiwan, Japan and California only. New Zealand apples are exported to all these markets. If *D. mali* is intercepted the consignment is fumigated and released into the market. The constraints to New Zealand apple exports are low and there is no reason to expect the issue to be different for Australian exporters.

86. Based on the above where one or more criteria have an impact of 'C' New Zealand asserts that the overall consequences of the entry, establishment and spread of *Dasineura mali* are "**VERY LOW**".

87. **Unrestricted risk estimate**: The changes to the various estimates of likelihood and consequence mentioned above have not impacted on the assessment of unrestricted risk of 'negligible' as given in the Draft Report.

Unrestricted risk estimate for *Dasineura mali*	
Overall probability of entry, establishment and spread	Very low
Consequences	Very Low
Unrestricted risk	**Negligible**

88. New Zealand agrees with this the assessment of unrestricted risk and that as a consequence risk management measures are not technically justified.

4.3. EUROPEAN CANKER

89. New Zealand largely agrees with the summary of the biology of this disease as provided in the Draft Report. This section does, however, omit an important fact, mentioned elsewhere in the Draft Report, namely that ascospore production from rotting fruit is rare and improbable under Australian conditions. New Zealand suggests it would be helpful if this was mentioned in the general section on biology of this disease.

90. The statement in the Draft Report, Section 4.3 page 93, that: "The disease was detected in 1954 in six blocks within four orchards in Spreyton, Tasmania, but it was eradicated by 1991 (Ransom 1997)" does not accurately reflect the duration of the European canker outbreak in Tasmania. Ransom (1997) stated that in about 1947 the disease had been "known in apple trees" and that "it may have been present for almost 20 years". New Zealand therefore requests that the statement be changed to "The European canker pathogen was identified in 1954 in six blocks within four orchards in Spreyton, Tasmania. It was probably present from the 1920s until its last detection in 1974 and was declared eradicated in 1991 (Ransom 1997)".

91. **Association of the pest with the crop:** The statement: "In Europe, European canker is an important disease in regions with annual rainfall of 653 mm to 791 mm, and average summer temperatures between 8C (minimum) and 21C (maximum) (McCraken *et al.* 2003b)" misrepresents the context of the quoted paper and is not a meaningful summary of climatic conditions associated with European canker in Europe. The rainfall and temperature ranges given in that study were averages for three sites in England and Northern Ireland. The authors did not make the generalisation that these were the conditions associated with the disease in Europe. New Zealand therefore requests that the paragraph be deleted and the word "However" at the beginning of the next paragraph also be deleted.

92. **Probability of importation:** The Draft Report states on page 95: "Murdoch (2002) and Wilton (2002) confirm that the spread of European canker out of the Auckland and Waikato areas has been through the movement of infected nursery plants or graft wood." New Zealand suggests adding that this is the only pathway that has been identified despite the unrestricted movement of apple fruit around the country since apple production began in New Zealand.

93. The Draft Report states on page 96: "Fruit rot caused by *N. ditissima* has been reported in New Zealand (Brook and Bailey 1965; Braithwaite 1996). A study showed that of 3300 rotted fruit sent for examination to HortResearch between 1999 and 2005, seven (0.21%) collected from the Waikato region were found to be infected with *N. ditissima* (MAF 2005a)."

94. While correct as far as it goes, what is not stated is that the 3,300 rotting fruit were collected over a six year period from the much greater volume of fruit harvested in the Waikato region. No estimate was made of the volume of fruit harvested in the Waikato in those years but the numbers will run into several hundreds of thousands. The figure of 0.21% is the percentage of rots found to be caused by *N. ditissima* in 3,300 rotting fruit; it is not the percentage of all fruit infected with *N. ditissima* at harvest in the Waikato region.

95. The Draft Report states on page 99: "For fruit that is stored for a significant time, re-inspection occurs to ensure fruit meets market requirements (MAF 2011). It is likely that latently infected fruits that can develop rots during this time (Berrie *et al.*

2007) will be removed during this inspection." New Zealand suggests the second sentence be reworded as follows: "Any rots that develop during storage (Berrie *et al.* 2007) will be removed during this inspection."

96. NZ asserts that the probability of importing *N. ditissima* into Australia on New Zealand apples is "extremely low" because of the evidence cited above, in the Draft Report and in particular because of the:

- Low incidence of *N. ditissima* in export orchards;
- IFP programme which reduces infection and inoculum levels of *N. ditissima* in all orchards;
- Unfavourable climate conditions for *N. ditissima* spore production and fruit infection during summer in export orchards; and
- Poor survival ability of *N. ditissima* spores on the surface of apple fruit.

97. **Probability of distribution:** New Zealand challenges the "very low" estimate of the likelihood that *N. ditissima* will be distributed in a viable state within Australia with imported fruit and transferred to a suitable host. New Zealand suggests an estimate of "negligible" is more appropriate.

98. As discussed in the section above on the likelihood of importation, the number of latently infected apples exported from New Zealand each year will be extremely low. New Zealand apples will be distributed throughout Australia but the great majority of the fruit will be sold and consumed in urban areas. The proportion of total apples that will be discarded near hosts of *N. ditissima* will be extremely small and consequently the numbers of latently infected fruit that will be discarded near hosts of *N. ditissima* will be very close to zero even if hosts "are present in many home gardens, parks and roadsides in large cities".

99. The Draft Report discusses the issue of the possibility of packing or repacking New Zealand apples in Australia. As explained previously the likelihood of this being required is extremely low, but additionally the likelihood that *N. ditissima* conidia (note ascosporses are not produced from rots on apple fruit) will be dispersed from a disposal site to a host plant is negligible. Conidia are only produced on rotting fruit when humidities approach 100% for prolonged periods (Swinburne 2010), a comparatively rare event. Conidia are spread by water splash or run-off, and not up and out of a waste dump. Disposed of apples will normally be covered by other waste or earth within hours of being dumped.

100. It is speculative to suggest that conidia produced by rots on apple fruit exposed in a skip, even if for several hours, might transfer by rain splash or run off to a susceptible host. The likelihood of this occurring is once again very close to zero. It is even more improbable to suggest that the likelihood that workers in packing houses would discard partially consumed apples in an apple orchard and that these might be a source of infection. It is doubtful that the probability of such an event could be measured.

101. It is perhaps worth recalling that to create the best chance that conidia produced by a rotten apple might be transmitted by water splash to a host, the discarded apple would have to land with the rot uppermost, any other position will result in harmless run-off into the soil (Swinburne 2009). This scenario reduces even further the negligible likelihoods that transfer might occur from discarded fruit mentioned above and the fact that conidia will only survive for short periods of time without moisture.

102. It is possible that microclimates suitable for European canker exist in some parts of Australia and that these might coincide with the presence of host plants in susceptible conditions, and it is even possible to speculate that sufficient numbers of *N. ditissima* conidia might be released by a rotting apple somewhere in the vicinity. But, the likelihood that these three criteria, which are essential for the establishment of infection, would occur at the same time and place cannot be differentiated from zero.

103. New Zealand asserts using the criteria of the Draft Report that the evidence supports a rating of "negligible" for the likelihood that *N. ditissima* is distributed in a viable state within Australia with imported fruit and transferred to a suitable host.

104. **Overall probability of entry:** The combination of the probability of importation (extremely low) with the probability of distribution (negligible) using the Draft Reports matrix of rules the likelihood that *Neonectria ditissima* will enter Australia as a result of trade in the commodity from New Zealand and be distributed in a viable state to a suitable host is: **NEGLIGIBLE**.

105. New Zealand asserts that there is insufficient evidence that the pathway is complete and therefore phytosanitary measures are not technically justified.

106. **Probability of establishment**: The Draft Report clearly states that the likelihood of establishment of European canker is dependent on climate, confirming what has been demonstrated in all countries where the disease has established, including Australia. Beresford and Kim (2011) demonstrated that in some parts of Australia climate conditions marginally favour the establishment of European canker.

107. Experience in Tasmania, where the climate is marginally suitable (Beresford and Kim 2011), shows that once established European canker can persist but reproduction is constrained. Swinburne (2009) suggests that one reason for the persistent nature of the Tasmanian outbreak may be that the pathogen was introduced within the original nursery stock as a semi-systemic infection and could only be managed by complete destruction of the tree.

108. However, ascospore production was not observed in the Tasmanian outbreak, thus it is a moot point whether establishment is truly successful if the organism is unable to complete its full life cycle.

109. New Zealand agrees with the Draft Report that "while it is not certain that *N. ditissima* would establish following successful distribution, it is an event that could occur in some years and locations." However, New Zealand asserts that this does not support a rating of "moderate" (i.e. an even probability) for the establishment of *N. ditissima*.

110. New Zealand asserts that the evidence presented in the Draft Report and above supports a rating of "very low" for the establishment of *N. ditissima*.

111. **Probability of spread:** The Tasmanian experience is perhaps the best exemplar for the likelihood of spread of European canker under Australian conditions.

It is misleading for the Draft Report to claim "the limited spread can also be attributed to the eradication program which began within two years of confirmation of the disease (Ransom 1997)." Ransom (1997) clearly states that a canker disease was known in apple trees in Spreyton, Tasmania, in 1947 and was likely to have been there for almost twenty years prior to this. The identity was first confirmed in 1954 and eradication began within two years.

112. The suggestion by Swinburne (2010) that the infection likely arrived with the nursery stock supports the theory that it had been in the orchard for at least 30 years before the eradication programme began.

113. None of the apple growing areas of Australia have climates suited to European canker (Beresford and Kim 2011), at best they are marginal. In the orchards in Spreyton, Tasmania, it took very many years for the infection to spread out of the orchards of origin, it did not spread to other susceptible hosts nearby and never spread to the main apple growing areas of Tasmania or mainland Australia despite unrestricted movement of fruit.

114. From all the evidence of the Draft Report New Zealand asserts that the likelihood of spread of *N. ditissima* by fruit is negligible. Natural spread from trees requires the production of ascospores which are wind distributed. Spread by conidia is primarily within the same or immediately adjacent trees via water splash and run off during rain events.

115. Ascospores were never detected on tree cankers in Spreyton, Tasmania, and there is no reason to expect they would be produced on hosts in the other areas of Australia with marginal climates for European canker. As a consequence spread from infected trees in Australia would always be extremely slow. The only demonstrated and likely mechanism for long distance spread, e.g. greater than 10m, is by movement of planting materials and this can be readily controlled by biosecurity authorities if needed.

116. New Zealand asserts that the evidence therefore supports a rating of "Extremely low" for the spread of *N. ditissima*.

117. **Overall probability of entry, establishment and spread:** Using the matrix of rules as per Table 2.2 of the Draft Report New Zealand asserts that the likelihood that *Neonectria ditissima* will enter Australia by the pathways discussed, be distributed in a viable state to susceptible hosts, establish in that area and subsequently spread within Australia is **NEGLIGIBLE** as set out below.

Importation	**Distribution**	**Entry**	**Establishment**	**Spread**	**PEES***
Extremely low	Negligible	Negligible	Very low	Extremely low	Negligible

*Probability of entry, establishment and spread.

118. **Consequences:** New Zealand challenges the Draft Report estimate of consequences as LOW.

119. *Plant life or health*: Two issues are of significance in assessing effects on plant life and health, 1) the extremely limited occurrence of areas of Australia where climate will allow some development of European canker and; 2) the extremely slow spread of the symptoms in Spreyton, Tasmania.

120. A combination of these two issues ensures that if establishment ever occurred it would remain local for a long time and likely be detected quickly. That being so its effects can only be of significance at the local level – "**C**".

121. *Eradication, control etc*.: No evidence is presented to suggest that the spread from an initial incursion would be any different to that experienced in Spreyton, Tasmania. The symptoms of European canker would ensure any incursion was reported quickly and therefore its distribution restricted as eradication measures were put in place. If an incursion occurred as a result of spore dispersal from a discarded apple then it is likely eradication would be more straight-forward than in Spreyton as the infection would not have time to become systemic in the tree.

122. Once again, as a result, its effects can only be of significance at the local level – "**C**".

123. *Domestic trade*: The Draft Report is correct to suggest that should an incursion occur control of movement of fruit between states would not be technically justified but control of movement of nursery stock may be. However, the Draft Report overstates the consequences.

124. If European canker did establish in one nursery its poor ability to spread under Australian climate conditions mean that it would likely be restricted to only the original nursery. Consequently all that would be technically justified would be the quarantining of that nursery not the District or State. That is, the effects of an incursion of European canker can only be of significance at the local level - "**C**".

125. Based on the decision rules in Table 2.4 of the Draft Report, that is, where the consequences of a pest with respect to one or more criteria are **"C"**, the overall consequences are estimated to be **VERY LOW**.

126. **Unrestricted risk estimate:** Using the risk estimation matrix shown in Table 2.5 of the Draft Report an estimate of unrestricted risk is identified in the table below.

Unrestricted risk estimate for *Neonectria ditissima*	
Overall probability of entry, establishment and spread	Negligible
Consequences	Very Low
Unrestricted risk	**Negligible**

127. New Zealand asserts that the unrestricted risk estimate for *N. ditissima* should be assessed as "**NEGLIGIBLE**", which achieves Australia's ALOP.

128. Consequently New Zealand asserts that additional risk management measures for this pest are not technically justified.

5. Pest risk management

129. Based on the assessment that the risks associated with the three pests of concern are negligible, New Zealand contends that apples in commercial trade will readily

achieve Australia's appropriate level of protection (ALOP). Further, if growers and packers do not use professional systems they will be unable to meet consumer demands for quality.

130. In light of this New Zealand asserts that the only technically justified requirement should be that apples for export to Australia must come from commercial orchards and be packed and exported through commercial operators. Be that as it may New Zealand will comment on each of the procedures suggested in the Draft Report.

5.1. PEST RISK MANAGEMENT MEASURES AND PHYTOSANITARY PROCEDURES

131. **Integrated fruit production system**: The Draft Report suggests that it is necessary that the apples come from orchards where pests and diseases are managed either by the industry integrated fruit production system or an equivalent system. The Draft Report also requires the systems to be verified and audited by Australia's Biosecurity Services Group.

132. The conditions in the orchard have very little to do with the unrestricted risk estimate of the three pests. For example: for fire blight there is no pathway for the bacteria to transfer from a discarded fruit to a susceptible host; for European canker it is the negligible likelihood of spore dispersal from a discarded apple even if latently infected and the generally unsuitable climate conditions for establishment in Australia; and for apple leafcurling midge it is the combination of the improbability of the pathway and the Very Low consequences.

133. New Zealand contends that as long as the New Zealand apple fruit are in commercial consignments, rather than home grown or hand carried fruit, no verification of orchard practices is warranted. New Zealand rejects the need for verification and audit by Australia that the industry integrated fruit production system is being used.

134. **Maturity testing**: The suggestion in the Draft Report that apples should be tested for maturity prior to export is based on the tenet that mature fruit is not infected by *Erwinia amylovora*, and do not produce bacterial rots and ooze. However, it is equally true that apples that are not mature cannot be marketed as they will have very poor flavour and sweetness.

135. In New Zealand, as in most other apple exporting countries maturity testing to determine the best harvest date, plus validation at the packing house, is standard commercial practice. Indeed without it commercial reputation would be lost.

136. New Zealand asserts that maturity testing should be accepted as standard commercial practice and verification and auditing should not be required.

137. Once fruit from a single variety and production site combination has been tested as mature, it follows that all subsequently harvested fruit from the same variety and production site combination will also be mature. Consequently New Zealand will use

the starch pattern index method of maturity testing on the first grower fruit submission of every new variety and production site combination on first arrival at the packhouse only.

138. **Sanitisers**: The regular replacement of dump tank water or use of sanitisers serve no phytosanitary purpose and should not be required.

139. The sanitisers have no effect on apple leafcurling midge and as the Draft Report points out colony forming units of *E. amylovora* or spores of *N. ditissima* on the surface of fruit in the orchard are in continuous decline. The likelihood of them being present on the surface of apple fruit on arrival at the packing house is negligible. Any viable bacteria that may be present on the skin will be in small numbers and an attenuated state. As the Draft Report points out ooze will not be present and consequently the bacteria will be unable to stick to any part of an insect's body and therefore the surface of apple fruit can play no part in the entry, establishment and spread of *E. amylovora* or *N. ditissima*.

140. New Zealand asserts that the requirement for the use of sanitizers in or the regular replacement of, dump tank water should be accepted as standard commercial practice and verification and auditing should not be required.

141. **Washing**: Water washing with rotation of fruit is standard practice in most export packing houses to remove contaminants such as leaves and poorly attached insects and to enhance cosmetic appearance. However, in the context of the low levels of *E. amylovora* or *N. ditissima* or apple leafcurling midge on the surface of apple fruit arriving from the field the effect on these pests is minor.

142. High pressure water washing of fruit is required to meet commercial standards and is standard practice in New Zealand export apple packing houses. New Zealand asserts that verification and auditing of this process should not be required.

143. **Management of leafrollers**: New Zealand attaches a report on leafrollers in harvested apple fruit prepared by Fruition Horticulture Ltd. an independent consultancy and technical services company with a current MAF Approved Organisation 'Pest Survey' system. This document reports on a survey carried out in three New Zealand packing houses on 30,000 reject apples from 5 varieties in May this year.

144. These fruit were cut and inspected for the presence of leafrollers (including native species and the Australian light brown apple moth). A zero incidence of fresh leafroller damage and no live, dead or damaged leafroller larvae were found. The average incidence of old leafroller chews on the surface of the fruit (most likely caused by light brown apple moth) was 0.25%.

145. This low level of incidence is in line with USDA pre-clearance inspections of apples for USA market where only eight light brown apple moth larvae and no native leafroller larvae have been found with 4,982,000 fruit inspected in 2011 up to 13 May 2011.

146. New Zealand submits this paper as evidence that the likelihood that leafrollers of quarantine concern to Australia are found on or in New Zealand apples is negligible and thus the only measure required should be fumigation in the unlikely event of an infestation being detected by AQIS inspection on-arrival in Australia.

147. **Pest risk management for pests for Western Australia only**: With regards to the possibility of exporting apples to Western Australia (WA) New Zealand will only comment on the management requirements for codling moth. The suggested measures for the other pest of concern are in line with New Zealand's expectations.

148. New Zealand exports apples to Taiwan and China who share WA's concerns about codling moth, *Cydia pomonella*. For these countries New Zealand provides assurances that the fruit is harvested from production sites with low pest prevalence for codling moth.

149. New Zealand will, in due course, submit a request for access of New Zealand apples to Western Australia building on the successful processes already in place to manage codling moth, *Cydia pomonella*.

5.2. OPERATIONAL SYSTEMS FOR MAINTENANCE AND VERIFICATION OF PHYTOSANITARY STATUS

150. **MAF Delegation of authority**: At several points throughout the Draft Report and in particular in the section on pest risk management, mention is made of the responsibilities of MAF and other New Zealand agencies involved in the MAF phytosanitary certification process. For the avoidance of doubt the following points of clarification are made:

1. MAF is the New Zealand National Plant Protection Organisation responsible for signing all New Zealand Phytosanitary Certificates.
2. The MAF phytosanitary certification system is based on the International Standard for Phytosanitary Measures No. 7 (ISPM 7) of the International Plant Protection Convention, and used ISO 9001 to design its quality systems.
3. The system operates through the delegation of authority by MAF to authorised Independent Verification Agencies (IVAs) and approved organisations to carry out activities and verification services on behalf of MAF.
4. MAF publishes operating standards and technical requirements to be met by organisations approved by MAF for the provision of phytosanitary certification services.
5. The series of plant export certification standards can be found on the Biosecurity New Zealand website:

   http://www.biosecurity.govt.nz/regs/exports/plants/stds

6. The standards are validated and maintained through a system of regular and/or unannounced audits of all participants. For example, MAF arranges for joint MAF - JAS-ANZ[12] audits of the IVAs and the IVAs audit all approved organisations. All non-compliances are reported and actioned in a process of continual checking and improvement.

7. Every approved operator[13] is audited at least four times per export season, one scheduled systems audit and at least three unannounced surveillance audits. It may not the operationally possible to audit all facilities at the beginning of each season as suggested by the Draft Report but New Zealand can ensure all approved operators are operating as required throughout the season.

8. MAF oversees the entire system, ensures optimal operation and audits Compliance Programmes itself. As a consequence where the Draft Report suggests, for example, that MAF audits facilities at the beginning of the season, this work will be done by a MAF delegated IVA who reports any critical non-compliances to MAF.

151. **Fumigation**: The Draft Report suggests that "Registered fumigators would need to comply with the current MAFNZ standards for export facilities, and also comply with Australian Fumigation Accreditation Scheme (AFAS) standards." New Zealand points out that any New Zealand fumigation operator wishing to provide services to meet fumigation requirements of importing countries, i.e. sufficient for inclusion on a phytosanitary certificate, must be MAF approved. MAF is currently in discussion with DAFF to ensure equivalence of import and export fumigation standards in both countries. Any requirements for New Zealand apples to Australia should not pre-empt these discussions.

152. **Pre-export phytosanitary certification**: As described above the risks associated with the three pests considered here are negligible and no phytosanitary measures should be required. The only technically justified requirement should be that apples for export to Australia must come from commercial orchards and be packed and exported through commercial operators.

153. Consequently New Zealand asserts that there is no technical justification for the requirement that the use of the integrated fruit production system, or equivalent, be mandatory on New Zealand orchards. New Zealand requests that mention of this be removed from the final version of the Report.

154. As regards the 600 fruit sample. This sample size ensures with 95% confidence that less than 0.5% of fruit in the inspected consignment are infested with quarantine pests. This is the standard MAF phytosanitary inspection regime which all export

[12] JAS-ANZ (the Joint Accreditation System of Australia and New Zealand) is the government-appointed accreditation body for Australia and New Zealand responsible for providing accreditation of conformity assessment bodies (CABs) in the fields of certification and inspection. Accreditation by JAS-ANZ demonstrates the competence and independence of these CABs.

[13] An approved operator must use an operations manual that covers all the issues of any market access compliance programme they wish to participate in. This operations manual must be approved and validated by an IVA and MAF before operations can begin. It is these operations that are audited by the IVA.

consignments must pass before being issued with a phytosanitary certificate certifying that the consignment meets the importing country's phytosanitary requirements.

155. Expressing the inspection regime in this fashion allows much needed flexibility during the inspection process. For example, packing houses may, for commercial reasons, inspect much larger samples and it is more efficient to use these samples for phytosanitary inspection rather than in some way segregating 600 fruit from the sample.

156. Stipulating that the consignment must be inspected to provide 95% confidence that less than 0.5% of fruit in the inspected consignment are infested with quarantine pests allows calculation of maximum pest limits without compromising quarantine security.

157. New Zealand requests that the Final Report expresses the inspection requirements in terms of statistical criteria, i.e. that the consignment is inspected to a standard that ensures with 95% confidence that less than 0.5% of fruit are infested with viable quarantine pests.

158. New Zealand defines a homogeneous lot as:

> "A defined volume of plant product subject to the same pest management regime that has been produced within a pre-determined production area, where the defective units within the lot occur independently of each other and the fraction of defective plant product is constant throughout the lot." (MAF 2006)

159. This definition fits the definition of a "lot" as used published under ISPM 5 (FAO 2009) and replicated in the Draft Report but it differs from the subsequent comment in the Draft Report on New Zealand practices in that there is no mention of time.

160. New Zealand asserts that there is no technical justification for limiting a 'lot' to "the volume of fruit of a single variety packed at one time and which has been picked from one orchard on one day." and requests that the New Zealand definition of 'lot' be used.

161. The term 'line' is used a number of times in the Draft Report. This term is used in various ways in different packing houses and is not standardised. New Zealand suggests use of the terms is best avoided.

162. **Review of policy**: As suggested in the Draft Report MAF will inform the DAFF immediately on detection in New Zealand of any new pests of apples that are of potential quarantine concern to Australia or a significant change in the application of existing commercial practices considered in this draft report.

163. Equally New Zealand reserves the right to seek a review of the import policy after the first year of trade, or when new science becomes available, or when there is reason to believe that the pest and phytosanitary status in New Zealand has changed.

6. References

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FRUITION Horticulture

Technical Report

Fruit cutting and inspection to quantify internal incidence of native leaf roller larvae

May 2011

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A MAF Approved Organisation (Pest Survey)

For:

Pipfruit NZ

Summary

30,000 packhouse reject apples from 5 varieties were cut and inspected for native leafroller species infestation in May, 2011.

The average incidence of old leafroller chews (including and most likely caused by LBAM) was 0.25%. There was a zero incidence of fresh leafroller damage and no live, dead or damaged leafroller at all were found.

This low level of incidence is in line with USDA fruit inspections for USA market pre-clearance where only 8 LBAM larvae and no native leafroller larvae have been found in 4,982,000 fruit inspected to 13 May 2011 .

Introduction

Fruition Horticulture (HB) Ltd undertook the project of cutting and inspecting 30,000 apples for leafroller incidence.

Fruition Horticulture (HB) Ltd is an independent consultancy and technical services company with a current MAF Approved Organisation 'Pest Survey' system. This work was carried out by trained, experienced and supervised personnel.

Materials and Methods

The project specifications were:

- Cutting of 50 x 600 fruit samples of pack house reject fruit,
- With particular attention to the calyx cavity, the calyx sinus to the core and the core,
- From Royal Gala, Pacific Rose™, Braeburn, Jazz™, Fuji varieties (or their sports) in approximate proportion to crop volume - within the constraints of fruit and time availability,
- From a minimum of 10 identified production sites,
- And collection of any leafroller larvae found to be sent to a MAF AO Pest identification laboratory for positive identification.

Fruit cutting and inspection was carried out at 3 large packhouses (Crasborns, Fruitpackers and Mr Apple) during the month of May, 2011.

Results

The incidence of leafroller damage was low. The average incidence of old leaf roller chews (includes all species) was 0.25%. No fresh chews or live larvae were found in any sample (Table 1).

Table 1. Summary of samples taken and leaf roller incidence

Variety	Number of 600 fruit samples taken	Incidence of Old Chews	Fresh Chews	Live Larvae
Braeburn	13	0.1%	-	-
Fuji	8	0.5%	-	-
Jazz	5	0.1%	-	-
Pacific Rose	5	0.2%	-	-
Royal Gala	19	0.3%	-	-
Total	50			
Average		0.25%	-	-

Discussion

The low incidence of leaf roller damage from all species including LBAM is in line with USDA interceptions for USA market pre-clearance over recent years.

Appendix

Note that orchard identity has been protected by only showing the first 2 digits from each Rpin. No more than 1 sample from any Rpin / variety was taken.

The complete dataset is:

Packhouse	Rpin	Variety	Old Chews	Fresh Chews	Live Larvae
1	15**	Braeburn	1	0	0
1	14**	Braeburn	1	0	0
1	15**	Braeburn	2	0	0
1	15**	Braeburn	0	0	0
1	18**	Braeburn	0	0	0
1	25**	Braeburn	0	0	0
1	17**	Braeburn	0	0	0
2	20**	Braeburn	0	0	0
2	14**	Braeburn	2	0	0
2	20**	Braeburn	1	0	0

2	10**	Braeburn	2	0	0
2	12**	Braeburn	1	0	0
2	10**	Braeburn	0	0	0
1	26**	Fuji	9	0	0
1	13**	Fuji	9	0	0
1	24**	Fuji	0	0	0
1	11**	Fuji	0	0	0
1	13**	Fuji	1	0	0
1	10**	Fuji	0	0	0
1	15**	Fuji	0	0	0
1	10**	Fuji	3	0	0
3	14**	Jazz	1	0	0
3	14**	Jazz	0	0	0
3	14**	Jazz	1	0	0
3	25**	Jazz	0	0	0
3	14**	Jazz	2	0	0
3	14**	Pacific Rose	2	0	0
3	11**	Pacific Rose	2	0	0
3	14**	Pacific Rose	1	0	0
3	14**	Pacific Rose	0	0	0
1	10**	Pacific Rose	1	0	0
3	14**	Royal Gala	1	0	0
3	13**	Royal Gala	1	0	0
3	14**	Royal Gala	1	0	0
1	15**	Royal Gala	1	0	0
1	25**	Royal Gala	1	0	0
1	13**	Royal Gala	0	0	0
2	13**	Royal Gala	1	0	0
2	14**	Royal Gala	0	0	0
2	10**	Royal Gala	6	0	0
2	23**	Royal Gala	2	0	0
2	16**	Royal Gala	1	0	0
2	23**	Royal Gala	4	0	0
2	23**	Royal Gala	5	0	0
2	17**	Royal Gala	1	0	0
2	12**	Royal Gala	0	0	0
2	10**	Royal Gala	2	0	0
2	16**	Royal Gala	3	0	0
2	20**	Royal Gala	6	0	0
2	15**	Royal Gala	0	0	0