Submission to Biosecurity Australia

Draft Revised Import Risk Analysis on the Importation of Apples from New Zealand (December 2005)

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Tasmanian Biosecurity Working Group (Apples/New Zealand)
Department of Primary Industries, Water, and Environment

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Executive Summary

In its previous submission (DPIWE, 2004) the Tasmanian government identified a number of concerns with the draft Import Risk Analysis (IRA) that was released by Biosecurity Australia in February 2004. In responding to the revised draft December 2005 IRA, the process adopted by the Tasmanian Government was to re-form the government/industry Tasmanian Biosecurity Working Group (Apples/New Zealand).

The working group's objective was to critically review the revised IRA and determine whether or not the issues raised in the June 2004 submission had been appropriately addressed by Biosecurity Australia. Also the working group critically appraised processes and procedures used by Biosecurity Australia in assessing environmental/economic risks posed by, or as a result of New Zealand apple imports into Australia, that has relevance to the biosecurity of Tasmania.

In its review, the working group paid particular attention to how the risk assessment methodology had been applied to arrive at each of the risk level findings. The phytosanitary measures proposed were seen to be particularly important as they constitute a 'risk management system' and as such each has to be appropriately effective to lower the risk level at each stage thus resulting in the acceptable very low risk category. The working group understands that the failure of any one, or combination of, the phytosanitary measures would likely breach Australia's Appropriate Level of Protection (ALOP).

This submission outlines a range of issues identified by the working group where concerns are expressed as to the scientific validity of some of the findings in the draft IRA, the efficacy of the risk management, and information that needs to be considered by Biosecurity Australia in the development of the final revised IRA report.

As a result of the Tasmanian review, the main areas of concern remaining are:

- Pathways-failure of high pressure washing to exclude insect pests.
- High pressure washing removing symptoms of presence of some insects that may actually be present.
- Lathridiid beetles, washing, and vector potential.
- Varietal susceptibility to fire blight.
- Chlorine treatment for risk management of fire blight.
- Orchard inspections for fire blight (statistical basis, pruning timing)
- Cross contamination of fruit on grading lines as part of an operational plan.
- Consequences of establishment of European canker: fungicides used in Australia and New Zealand.
- Freedom from symptoms (orchard or block) and the SPS agreement.
- Inspection of 600 unit samples.
- Removal of the requirement for fruit to be placed in cold storage for up to six weeks.

The working group has identified that there still remain areas of concern with the risk management system recommended by the revised draft December 2005 IRA. Unless these are adequately addressed it is the opinion of the Tasmanian Government there is significant doubt as to whether Australia's ALOP can be met through the application of the recommended phytosanitary measures proposed by Biosecurity Australia for the importation of apples from New Zealand.

Introduction

In its previous submission (DPIWE, 2004) the Tasmanian government identified a number of concerns with the draft Import Risk Analysis (IRA) that was released by Biosecurity Australia in February 2004. In responding to the revised draft December 2005 IRA the process adopted by the Tasmanian Government was to re-form the government/industry Tasmanian Biosecurity Working Group (Apples/New Zealand). The working group's objective was to critically review the revised IRA and determine whether or not the issues raised in the June 2004 submission had been addressed by Biosecurity Australia. Also the working group critically appraised processes and procedures used by Biosecurity Australia in assessing environmental/economic risks posed by, or as a result of New Zealand apple imports into Australia, that has relevance to the biosecurity of Tasmania.

The process of review by the working group was based on individual working group members reviewing relevant components of the revised draft December 2005 IRA, according to their discipline eg. entomology, plant pathology, agronomy, etc, and developing input for the drafting of this submission. Working group members then met to discuss the individual reviews that form the basis of this submission.

In undertaking this review, the working group understood the principles of managed risk and Australia's Appropriate Level of Protection (ALOP) at a 'very low risk' setting. The working group has undertaken this review based on the understanding that unrestricted entry of apple imports from New Zealand was found to pose a **low** risk of the introduction of nominated pests and disease to Australia. It is understood that the **low** risk level breaches Australia's ALOP of **very low** and therefore risk management measures need to be undertaken to reduce the risk level to the acceptable level of **very low.**

In summary the risk management measures proposed in the revised draft December 2005 IRA and reviewed by the working group are:

- Mandatory pre-clearance arrangements undertaken by Australian Quarantine and Inspection Service officers.
- Orchard inspections undertaken for fire blight symptoms.
- Use of disinfection treatment (eg. chlorine) in the packinghouse to prevent contamination of apples with fire blight bacteria.
- Inspection of orchards for freedom from European canker disease.
- Inspection in New Zealand of a random sample of 3000 fruit from each lot for freedom from apple leaf curling midge. Detection of apple leaf curling midge would result in rejection of the lot or treatment. Alternatively, a treatment such as fumigation could be used for all export lots.
- Inspection for all other quarantine pests with remedial action taken.
- For the disease apple scab, imports of New Zealand apples into Western Australia would not be permitted.

Based on the stated understanding of risk and ALOP and the proposed phytosanitary measures recommended by Biosecurity Australia for apple import, the working group identified that there still remain areas of concern with the risk management system recommended by the revised draft

December 2005 IRA. In the opinion of the Tasmanian Government, this would cast doubt as to whether Australia's ALOP can be met through the application of the risk management system recommended by Biosecurity Australia for the importation of apples from New Zealand. Under these circumstances Tasmania could not support the proposed importation of apples from New Zealand.

Issues

During its assessment of the revised draft December 2005 IRA the working group noted several issues of concern raised previously by the Tasmanian Government (June 2004) have been addressed by Biosecurity Australia. However, it is acknowledged that though some of those concerns have been addressed or are no longer issues for Tasmania, there still remain areas of concern with the revised draft December 2005 IRA and these are detailed in the following sections:

a) Pathways-failure of high-pressure washing to exclude insect pests and

b) High pressure washing removes symptoms of presence of some insects even though they may be present.

The central concern that Tasmania highlighted in its June 2004 submission was the possibility that leafroller caterpillars and their parasitoids (perhaps *Pales* and *Diadegma* wasps) could be carried within fruit and not be removed by brushing, washing and visual grading.

A related concern was that brushing and washing before visual grading would remove indicators such as frass that would otherwise alert graders to the presence of caterpillars within fruit.

The working group notes that pre clearance inspectors would see fruit only after washing and brushing had removed most indicators of internal caterpillars.

The revised draft December 2005 IRA (Part B, page 215) states that the unrestricted risk for leafrollers is 'low' and above the Australian ALOP indicating a need for risk management for leafrollers. It should be noted that the parasitoid questions mentioned by Tasmania previously (June 2004) are not explicitly addressed in the IRA revisions.

The risk management proposal in the revised draft December 2005 IRA (Part B, pages 215-6) acknowledges that 'visual inspection may not be appropriate for detecting the internal larvae in apple fruit' and that there is 'uncertainty about the level of internal infestation of apple fruit by ... leafrollers'.

The revised draft December 2005 IRA proposes that fruit is cut open at the beginning of each export season to provide better data on frequency of internal caterpillars. The sample would be 600 fruit per packing house. It proposes further sampling through the export season if internal caterpillars are found in the first sample and various options for withdrawing, re-exporting, destruction or treatment of defective consignments at pre-clearance or at inspection on arrival in Australia.

This risk management process of inspecting cut apples is acceptable to Tasmania. It circumvents the issue of whether washing and brushing remove indicator debris before external inspection. It also circumvents the need to determine the host range of the parasitoids, *Pales* and *Diadegma* that may be present in leafroller caterpillars because they would be rejected with their host caterpillars if detected.

However, the revised draft December 2005 IRA, (Part B, page 206 - Processing of fruit in packing houses) still contains the dubious assertion that "…sorting and grading would remove some fruit that are contaminated with … internal larvae as entrance holes or frass (droppings)

outside the fruit would be noticeable". This dot point follows one asserting that washing and brushing will remove caterpillars feeding externally with the implication that visual inspection follows the washing and brushing steps.

Yet the sequence of these critical packinghouse processes is not clarified in the IRA so it must be assumed that standard packinghouse procedures for export will remove debris indicating caterpillars within fruit.

The IRA should make explicit the sequence of processes to be followed by packinghouses.

c) Lathridiid beetles, washing, and vector potential

In its June 2004 submission Tasmania argued that three species of Lathridiidae that are not present in Australia were rated as present on the pathway but the consequence of this was underrated. The species were *Cartodere filum*, *Cortinicara meridiana* and *Corticaria serrata*.

In the revised draft December 2005 IRA, the discussion of fireblight vectors (p 86) does not explicitly address lathridiid beetles. The IRA mentions 77 arthropod genera including 27 insect species but does not clarify if Lathridiidae are among that group. It remains likely that Lathridiidae are potential vectors of fireblight.

Part C of the revised draft December 2005 IRA classifies the Lathridiidae (*Cartodere*, *Cortinicara* and *Corticaria*) as 'contaminants' that will be handled under AQIS policy for contaminants. This means treatment, destruction or re-export of consignments found to be contaminated.

Tasmania will require strict enforcement of such policy for all contaminant insects that may carry fireblight until further evidence clarifies their capacity as vectors or otherwise.

d) Varietal susceptibility to fire blight

The revised draft December 2005 IRA has not addressed the issue of the varietal susceptibility to fire blight of apples grown and produced in Tasmania. In its June 2004 submission to the February 2004 IRA the Tasmanian government stated that the implications of this relate to the probability of higher risk levels for fire blight infection from imports.

Details on Tasmania's views on the susceptibility of variety of apples to fireblight provided in Tasmania's previous submission are detailed again in **Appendix 1**.

e) Chlorine treatment for risk management of fire blight

There still remain serious concerns over the effectiveness of the use of chlorine treatment to reduce the risk of fire blight.

The efficacy of chlorine in minimising cross-contamination of fruit in the dump tank is a function of the dose (ppm), temperature (eg. Sabaa-Srur *et al.*, 1993), pH, fruit load and the level of extraneous organic matter. Page 295 of the IRA outlines the frequency of monitoring available chlorine and pH, but there is no mention of requirements for the dump water temperature.

The revised draft December 2005 IRA also fails to provide a refereed, scientific citation that demonstrates that chlorine treatment at 100 ppm is effective in killing cells of *E. amylovora* suspended in water. Hence, the risk management proposed relies on extrapolation of results from chlorine treatment of other bacteria.

The revised draft December 2005 IRA attempts to account for conditions of low temperature or the presence of organic matter in the dump tank, but it is unclear as to how the following statement on page 98 is derived: "...if chlorine concentration and pH levels are maintained correctly, at least 10 to 100 fold reductions in the bacterial numbers can be expected". Similarly, it is unclear how the reduction factors listed on page 98 of 0.66, 0.15 and 0.95, for surface contamination, calyx infestation and contamination, were derived.

There should also be some quantification or test for how much organic matter is present and the level at which chlorine treatment becomes ineffective. Otherwise, removal of extraneous organic matter will be done on a subjective basis, and with minimal incentive for this task at peak periods of pack house activity.

There is also doubt over the statement on page 69 that 'compared to the dump tank, the rest of the packing line is considered to be a less significant contamination source.' According to 'Guidelines for the Management of Microbial Food Safety in Fruit Packing Houses', (Department of Agriculture, Western Australia, Bulletin 4567, December 2002) there are many sites on the washing and grading lines that are high risk for the survival of certain pathogens. These include: wash brushes, wash rollers, wash filter, rinse brushes, rinse flaps, water rollers and wash tap. Cups that convey fruit along the grading line should also be kept clean as they are in direct contact with fruit.

In the summary on page 66 (Part B) it is concluded; 'None of the processes undertaken at this stage would have a large influence on the survival of *E. amylovora* on apple fruit. However, depending on individual packing house procedures, ***some reduction*** in the number of fruit carrying bacteria ***would be expected'.***

The argument presented in Tasmania's June 2004 submission does not alter on the basis of research results relating to the effectiveness of disinfestation treatments, presented in the revised draft December 2005 IRA (pages 63-99).

Although the revised draft December 2005 IRA concludes that the use of chlorine treatment alone would not be a sufficient risk management measure, Tasmania's concern, expressed in its June 2004 submission to Biosecurity Australia, that chlorine treatment should be replaced with an effective measure otherwise Australia's ALOP will be exceeded, has not been addressed.

Further, given the concern expressed over the efficacy of chlorine treatment and the reliability on inspection regimes to detect infected fruit it is of concern to Tasmania that if either of these approaches are defective or not implemented in a stringent manner then the effectiveness of the risk management approach is undermined. This is particularly so as the requirement for fruit to be placed in cold storage for up to six weeks has been removed from the risk management approaches now recommended in the revised draft December 2005 IRA. The retention of this requirement would have significantly strengthened the risk management system.

f) Orchard inspections for fireblight

The revised draft December 2005 IRA proposes orchard inspections for fire blight symptoms is conducted at an intensity that would, at a 95% confidence level, detect visual symptoms if shown by 1% of trees. There does not appear to be an explanation for choosing either the 95% confidence level or a symptom incidence of 1% of trees.

Furthermore, this proposed measure does not appear to account for the undefined relationship between disease incidence and severity. For example, if 1 in every 100 trees had visual symptoms, then the disease incidence would be 1%. However, the severity of visual symptoms per tree could be high, moderate, or low .

MacKenzie (1981) suggests that most potato growers do not discover potato late blight (a foliar disease) until disease severity reaches 1%. Therefore if the relationship between fireblight incidence and severity similarly were known, then it may be possible to evaluate whether detection would fail frequently at 1% disease incidence. Notwithstanding this any inspection regime will be resource intensive and will require high levels of training to ensure effective implementation.

In addition, pruning of branches displaying symptoms of fireblight could take place prior to inspection thus preventing the detection of symptoms even though disease was present. This possibility needs to be addressed appropriately to provide further assurance.

g) Cross contamination of fruit on grading lines as part of an operational plan.

The revised draft December 2005 IRA states that packing line and houses are considered to be a less significant contamination source with New Zealand maintaining graders and conveyors in good hygienic condition, and up to 93% use high pressure water blasters with disinfectant to clean these areas.

New Zealand packing shed and grading equipment management practises may be in agreement with standard QA program for export fruit. However, frequency and timing of grader surface sterilisation may not address the issue of possible cross contamination by fireblight bacteria between different orchard/block fruit lots.

The assigned export sheds and grading equipment should only handle fruit from approved orchard blocks or put in place grader surface sterilisation and decontamination of the fruit water dumping system prior to grading fruit sourced from approved orchards or orchard blocks.

h) Consequences of establishment of European canker: fungicides used in Australia and New Zealand

The revised draft December 2005 IRA states that fungicide programs adopted for control of black spot and powdery mildew will suppress European canker. However, there continues to be the assumption that fungicide programs used in New Zealand and Australia are comparable. Relatively new apple varieties grown in Tasmania appear to be more susceptible to powdery mildew than older varieties. Strategic application of target specific fungicides for black spot, especially at low water volume, can sometimes be accompanied by an increase in powdery mildew, illustrating that the "one-fungicide program fits all" scenario can be ineffective.

Fungicide programs in Tasmania are increasingly based on the DMI and strobilurin fungicides. DMI fungicides do not appear to be on the IRA list of fungicides that suppress European canker. Although strobilurins appear to provide effective control of European canker, pathogen resistance has been reported (Ishii *et al.*, 2001) and their use will be limited to one or two applications by the need to deploy a fungicide resistance management strategy. Dodine, another potential suppressant of European canker, is rarely, if ever, applied for the control of black spot in Tasmania.

Gildemacher *et al.* (2001) report that "omitting fungicides against fruit tree canker (*Nectria galligena*) proved disastrous" when comparing conventional, integrated and a minimum chemical input farming system for apples in the Netherlands. The revised December 2005 IRA states that the use of fungicides has not been altered substantially with the adoption of IFP in New Zealand. An explanation for this observation, which relates to Hawke's Bay in New Zealand, is that weather conditions in spring are often favourable for infection by the black spot fungus and so the use of fungicides has not diminished in that particular region.

However, there will be sites and seasons in Australia where weather conditions are sometimes unsuitable for infection by the black spot fungus and fungicide use would be reduced with the adoption of disease forecasting and IFP. Sub-optimal conditions for black spot development might also limit development of European canker, but unlike the black spot fungus, spores and infection sites for *Nectria galligena* are available throughout the year.

The most important period for infection was not determined for Tasmania during the eradication program between 1954 and 1991 (Ransom, 1997). If infection occurs mainly in autumn through leaf scars, and leaves fall over a long period, then multiple applications of fungicide will be required to reduce disease establishment and spread (Teviotdale and Gubler, 2005), and at significant extra cost.

In short, the revised draft December 2005 IRA does not address the knowledge gap relating to the possible difference between Australia and New Zealand in patterns of fungicide use, and the consequence of additional and costly crop protection during leaf fall in autumn. Consideration should be given to changing the impact score from 'D' to 'E'.

There is a discrepancy in the stated survey times Part A page 15 states autumn as the survey times, whilst in Part B on page 138 it states the survey time would take part in winter after leaf fall. This requires clarification.

i) Freedom from symptoms (orchard or block) and the SPS agreement

As part of the risk management approach the implementation of pest free places of production requirements, based on the International Standards for Phytosanitary Measures (ISPM), would be required for diseases such as European canker, with exports of fruit only proceeding from areas that could confirm freedom in accordance with the requirements of the standard.

A pest free place of production according to the relevant ISPM (*Requirements for the establishment of Pest Free Places of Production and Pest Free Production sites*, No. 10) is "a place of production in which a specific pest does not occur as demonstrated by scientific evidence…" (ISPM, No. 10, page 5).

It is not clear as to whether this requirement is also a requirement for the place to be free from the symptoms of disease. Under the ISPM, a pest is defined as "any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products". A pathogen is, according to the Macquarie dictionary "an agent causing a disease" but would not seem to include the disease itself, which would appear to be critical from the perspective of European canker.

The revised draft December 2005 IRA makes reference to ensuring that places of production are free from European canker disease symptoms. It is the requirement only to ensure "disease free symptoms" that is of cause of concern to Tasmania. Particularly so given that it would appear that the purpose of the ISPM No 10 is to affirm that the place of production is free from the pest (as defined by the standard).

The revised draft December 2005 IRA should be clear as to what is required from the risk management techniques it recommends to be implemented for managing the risk of European canker. Perhaps the revised draft December 2005 IRA (page 137) can be clarified to ensure that the requirement is to utilise the ISPM No. 10 standard to "establish, maintain and verify freedom from European canker disease" which would be more consistent with the requirements and definitions of the IPSM standard.

j) Inspection of 600 unit samples

There is a concern over the limit on the samples that will be taken for inspection of fruit as proposed as part of the risk management system. It is unclear as how the selection of the 600 units is to take place. Moreover, there is a concern that where the fruit comes from more than one orchard or block that constitute a lot the limit of 600 units divided proportionally across the number of orchards or blocks that make up that lot would seem to dilute the effectiveness of the sample inspection system. An increased number of orchards or blocks represented in a lot would reduce the number of unit to be inspected from a particular orchard or block. This must have an affect on the ability to detect infected fruit form any one orchard or block.

Conclusions

The revised draft December 2005 IRA does address in part some of the concerns originally raised by the Tasmanian Government in its June 2004 submission to Biosecurity Australia.

However, there is a large reliance on inspection regimes to manage the risks to the level that is acceptable to meet Australia's ALOP. This will be resource intensive and will require high levels of training to ensure effective implementation.

Of the issues of concern to Tasmania there are still serious concerns over the effectiveness of the use of chlorine treatment to reduce the risk of fire blight, notwithstanding the shift in emphasis on the role of chlorine treatment within the risk management system proposed.

The concerns over the use of inspection regimes (statistical basis, timing with respect pruning) and chlorine treatment to manage the risks of infected fruit is that if either of these approaches are defective or not implemented in a stringent manner then the effectiveness of the risk management approach is undermined.

It remains a concern that the effectiveness of the risk management system has been undermined by the removal from the revised draft December 2005 IRA of the requirement for fruit to be placed in cold storage for up to six weeks. The retention of this requirement would have significantly strengthened the risk management system.

There are also doubts over the effectiveness of comparing fungicide programs for European Canker between New Zealand and Australia.

There is still no analysis of the varietal susceptibility of Tasmanian apples to fireblight. With no understanding of that risk it is difficult to reach any conclusion on the ability of the proposed risk management system detailed in the revised draft December 2005 IRA to address this issue.

Of the revised methods proposed there will need to be strict enforcement of the treatment, destruction or re-export system recommended for fruit contaminated with Lathridiidae and all contaminant insects that may carry fireblight until further evidence clarifies their capacity as vectors.

Further the management practises for New Zealand packing shed and grading equipment provided in the revised draft December 2005 IRA may not address the issue of possible cross contamination by fireblight bacteria between different orchard/block fruit lots. There should be a requirement in the IRA that assigned export sheds and grading equipment should only handle fruit from approved orchard blocks or put in place grader surface sterilisation and decontamination of fruit water dumping system prior to grading fruit sourced from approved orchards or orchard blocks.

The working group has identified that there still remain areas of concern with the risk management system recommended by the revised draft December 2005 IRA. Unless these are adequately addressed it is the opinion of the Tasmanian Government there is significant doubt as to whether Australia's ALOP can be met through the application of the recommended

phytosanitary measures proposed by Biosecurity Australia for the importation of apples from New Zealand. Under these circumstances Tasmania could not support the proposed importation of apples from New Zealand.

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Appendix 1: Varietal susceptibility to fire blight

(Extract from DPIWE, 2004)

The apple variety structure in New Zealand is dominated by Braeburn, Royal Gala and Fuji. They represent 82% of the total export volume[1]. It can be safely assumed that the first two cultivars will be, by far, the main commodities included in the proposed exports to Australia.

The export volume of these varieties reflects their prevalence in all principal apple production regions of New Zealand. According to New Zealand experience Royal Gala and Braeburn are rated as "very susceptible" and "susceptible" to fire blight infections. Important dwarfing apple rootstocks M9 and M26 adopted in new intensive plantings are described as very prone to fire blight. Apart from Malus and Pyrus, New Zealand lists a further 21 species of fire blight host plants (NZ pipfruit IFP manual, 2001). Extensive plantings of fire blight susceptible export varieties, rootstocks and other widespread host plants provide good conditions for a high incidence of the disease in all commercial orchards.

In Australia (ABS, 2002) fire blight susceptible varieties Cripps' Pink (Pink Lady™), Cripps' Red (Sundowner™), Royal and Imperial Gala, Fuji, Jonathan and Braeburn account for 56.6% of the total tree numbers and 79% of the tree population in new plantings – one to three year age category. Very sensitive apple rootstocks M9 and M26 are also very common in new orchard developments.

The pear variety structure in Australia (ABS, 2002) shows that 95.5% of production and 88.8% of trees belong to Williams B.C., Packham, Beurre Bosc, Nashi and Corella. According to New Zealand sources the listed cultivars are rated as "susceptible" or "very susceptible" to the disease. (NZ pipfruit IFP manual, 2001)

In addition to Malus and Pyrus all other fire blight host species recorded in New Zealand are also present in Australia. The combined flowering phase of these plants extends from September to March (DPIWE, 1996).

[1] Draft revised IRA report on apples from New Zealand 2004 (Table 4)

Appendix 2: Terms of Reference for the Tasmanian Biosecurity Working Group (Apples New Zealand) 2005

1. Critically review processes and procedures used by Biosecurity Australia in assessing environmental/economic risks posed by, or as a result of NZ apple imports, that has relevance to the biosecurity of Tasmania.

2. Assess the scientific validity of IRA findings, identify if there are additional issues of biosecurity concern to Tasmania in relation to the IRA, and provide review findings to Biosecurity Australia.

3. Additional external expertise may be co-opted from a range or relevant branches, divisions, agencies or institutions for the purposes of critically reviewing the IRA or associated documents if deemed necessary by the BC Working Group.

4. The Working Groups' deliberations will remain confidential until final assessments/advisories are completed and cleared by Minister for Primary Industries and Water.

5. The Working Group (Apples/New Zealand) role and terms of reference will be maintained until final decisions have been made on the import application.

6. If this time period exceeds 12 months these terms of reference will be reviewed to ensure alignment with the biosecurity interests of Tasmania.