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Fax	6272 ~~3307~~ 5145	**Date**	27 June 2008
		Pages	21 (including this page)

Subject Comments on Draft Import Risk Analysis report for fresh stone fruit from California, Idaho, Oregon and Washington

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New South Wales

DEPARTMENT OF PRIMARY INDUSTRIES

DGO08/524

27 JUN 2008

Mr John Cahill
Chief Executive
Biosecurity Australia
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CANBERRA ACT 2601

Dear Mr Cahill

I refer to the release by Biosecurity Australia (BA) in April 2008 of the Draft Import Risk Analysis report for fresh stone fruit from California, Idaho, Oregon and Washington, for which stakeholder comment was requested.

A technical review undertaken by experts in NSW Department of Primary Industries indicates that BA has underestimated the likelihood and consequences of risk that NSW would incur in some instances if stone fruit were to be imported into Australia from California and the Pacific Northwest states of America. Exotic pest and disease introductions may still occur despite mitigation measures being imposed.

Of particular significance to NSW are the concerns of the Australian low chill stone fruit industry. This sector while producing 10% of the total stonefruit crop, represents 25% of total value, due to higher price premiums received for early season fruit. Low chill stone fruit grows and is harvested earlier than more traditional medium and high chill fruit. In warmer production areas young leaves emerge in July. As the IRA states that stone fruit from California and the Pacific Northwest is likely to arrive in Australia from June until late October, there is a cropping overlap and the NSW low chill production areas could provide ample opportunity for establishment of pests present in import consignment.

Greater specification is required for mandated conditions to mitigate risks to acceptable levels and to establish audit processes for orchards exporting to Australia. Lack of detail regarding pest risk management presents a suite of unanswered concerns for which there seems to be no consultation mechanism that harnesses the expertise of Australian government and industry stakeholders. Protocols for implementing risk managed importation of stone fruits should be documented as part of a quality system, including reference to the specific standards that will be used, competency levels required of inspectors and audit benchmarks. This information should be included in the IRA for scrutiny by stakeholders.

A detailed submission from NSW DPI is presented with this letter.

When the final IRA is released, I would appreciate your department providing an itemised synopsis of the points raised by the NSW DPI submission and your response to each as you progress assessment of this request by the USA to access Australian markets.

Yours sincerely

RENATA BROOKS
ACTING DIRECTOR-GENERAL

Encl

Comments on the draft Import Risk Analysis report: Fresh stone fruit from California, Idaho, Oregon and Washington

June 2008

Submission to Biosecurity Australia

by NSW Department of Primary Industries

NSW DEPARTMENT OF PRIMARY INDUSTRIES

Title: Comments on the draft Import Risk Analysis report for fresh stone fruit from California, Idaho, Oregon and Washington

Submission to Biosecurity Australia by NSW Department of Primary Industries.

Disclaimer:
The information contained in this publication is based on knowledge and understanding at the time of writing (June 2008). However, because of advances in knowledge, users are reminded of the need to ensure that information on which they rely is up to date and to check the currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent advisor.

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Issues affecting NSW

Low chill production

A significant proportion of the Australian low chill stone fruit industry exists on the NSW north coast and hinterlands. This sector while producing 10% of the total stonefruit crop, represents 25% of total value, due to higher price premiums received for early season fruit. Low chill stone fruit grows and is harvested earlier than more traditional medium and high chill fruit; young leaves emerge in July in warmer production areas.

The IRA states that stone fruit from California and the Pacific Northwest states of America would be harvested during Australia's winter and arrive in Australia from June until late October. Accompanying this statement is the assertion that any overlap with Australian cropping cycles would "present a narrow window, late in the USA export season, when Australian trees may have their first leaves which would be susceptible to infection (p120)". With regard to NSW low chill stone fruit production, the idea of a narrow window for risk of infection by exotic pests and diseases is incorrect. The production overlap is four months. Production areas in NSW would bear a disproportionate risk of pests and diseases establishing and spreading. Milder winter conditions in low chill production areas would protect some potential exotic pests and diseases against cold temperature mortality.

Climate change

Effects of climate change are likely to be experienced in Australian stone fruit production areas. Geographic locations of production areas are likely to change and low chill varieties may become more widely cultivated. Such likely changes have not been addressed in the current IRA.

Collateral damage

Insufficient emphasis is placed on the potential for collateral damage by pests and diseases which may be of lesser significance for the targeted commodity but if imported into Australia could have significant impacts on another commodity. The issue is not just that of contaminating pests, which, the IRA notes, "are addressed by AQIS standard procedures" (p12). Representatives of potentially affected industries should be notified of the release of the IRA for comment and alerted to the possibilities of risk to their industries.

Some examples of pests and diseases that may affect other industries are:

- genus *Rhagoletis* tephritid fruit flies walnut husk fly and apple maggot. For these species, the IRA notes that "Australia's trapping grid for fruit fly species of economic concern does not target any *Rhagoletis* species" (p46).
- mirid – *Lygus lineolaris* (Tarnished plant bug). In addition to listing more than 385 host plants and being able to transmit disease, this exotic has been identified by the Australian National Strawberry Industry Biosecurity Plan as of particular concern. It is also reported in the USA as a pest of increasing importance on conifer seedlings.

- xylem infecting bacterium *Xylella fastidiosa*. This bacterium has a broad host range and is the causal agent of diseases in many hosts. The bacterial strains capable of infecting peaches and plums cause variegated chlorosis (pecosita) of citrus and leaf scorch of coffee. The strain that causes Pierce's disease in grapes has been designated as a pest a Category 2 pest under the government and plant industries cost-sharing deed.
- spider mite *Tetranychus turkestani*. This mite has a host range of more than 200 different plants, including prunus and citrus, commonly grown plants in many backyards, and cotton, a significant broad acre crop in NSW.
- powdery mildew *Podosphaera clandestina*. This obligate fungal pathogen causes powdery mildew in a range of stone fruit. Various strains of the pathogen exist and strains infecting the majority of stone fruit varieties are endemic to Australia. The exception is the strain capable of infecting cherries. Threats to the cherry industry due to the persistence of hydrophobic mycelium and spores in stone fruit calyxes should be addressed.

The IRA process

Presentation of the IRA

The methods section (Chapter 2) of this IRA more clearly presents IRA theory to general readers than earlier IRAs. Some examples are

- redirecting the emphasis of assigned likelihoods from semi-quantitative to qualitative descriptors
- presentation of the decision rules for determining overall consequences as a table rather than bulleted text.

Nevertheless

(a) An anomaly of the residual 'semi-quantitative' approach (such as Table 2.1 p16) is the multiplying effect of assigned levels of risk. For example a moderate level of risk combined with another moderate level of risk yields a low level of risk:
Moderate x Moderate = Low
When considered qualitatively, it seems counter-intuitive that the combining of two equivalent risk ratings results in a lesser level of risk.

(b) Industry representatives have questioned why all components of the risk analysis are weighted equally. The opinion was expressed that entry and consequences should carry greater significance than establishment and spread because establishment and spread are conditional upon entry occurring and impacts are translated as consequences.

(c) This IRA made cross reference to existing policy for stone fruits from New Zealand (undated) for pests such as Western flower thrips and Citrophilus mealybug (p70, 103). The existing policy for stone fruits from New Zealand was not obvious on the BA website. If existing policy is to be referenced in an IRA, the policy should be readily accessible and easily located.

Pest Categorisation

(a) The stated criterion for further consideration of pathogens in the pest categorisation tables is the possibility of the pathogen's association with mature, fresh harvested fruit. However, fruit infecting pathogens, including *Kloeckera apiculata* and *Issatchenkia scutulate*, (p228) are often rejected for further consideration because they are "a post-harvest rot that affects damaged fruit" and "as damaged fruit would be culled during harvest and processing, these would not be exported." To dismiss these fruit infecting fungi in this manner is simplistic. Infection by most post harvest pathogens occurs early in the development of the fruit or can occur through small wounds which are unlikely to be detected by visual inspection during harvest or processing. This allows a pathway for entry and symptoms may only be noticed when fruit is sold. Post harvest pathogens should be considered further.

(b) Assigning organisms for further consideration sometimes seems inconsistent. An illustration of this relates to fungi of regional concern to Western Australia (WA). Three species of *Mucor* for which there are no records in WA are noted, with the recommendation that they not be considered further (p199). Immediately following them in the list is *Nectria cinnabarina*, another pathogen recorded in eastern Australia but not in WA. However, in this case the IRA recommends further consideration. The incongruity of the decision is highlighted because *Mucor*, a pathogen of whole fruit, is likely to be associated with mature, fresh harvested fruit.

(c) The pathway association comments in the pest categorisation table for Bronze appletree weevil are inaccurate. The entry refers to pycnidia and spores and the supporting reference, Biggs (1997) relates to *Leucostoma* canker of stone fruits, not weevils. Is Bronze appletree weevil associated with mature fresh harvested fruit and should further measures be applied to manage the risks?

Probabilities of risk

(a) Questioning assigned probabilities of risk

- What triggers a review of previously assigned risk levels?
  Citrophilus mealybug, for example, is reported as having been intercepted on consignments of stone fruit (p218) yet the probability of entry, establishment and spread which was previously assessed as moderate (cited in the importation of stone fruit from New Zealand) has been retained (p70). Is not the probability of entry, establishment and spread increased because the pest has been intercepted on the pathway?
- The risks assigned to some pests appear to be significantly underestimated. For example, the probability of importation of spider mites is estimated to be moderate (p33) even though the reasons presented (p34) indicate that a ranking of high might apply. In support of a higher ranking, the IRA specifically mentions that
  [i] an average incidence of Pacific spider mites after packing is 11 mites per 100 000 fruit
  [ii] *Tetranychus spp.* spider mites have been intercepted numerous times on stone fruit from New Zealand.

- Similarly, the probability of importation of mirids (p56) is ranked as very low, even though the IRA states that, other than obviously damaged fruit, "fruit containing eggs is not expected to be removed by grading and culling operations". If the probability of importation were low rather than very low, the probability of entry would then be low (low x moderate) and, sequentially, the unrestricted risk would be low. Specific risk management measures would then be required for these pests.

(b) Questioning assumptions made in considering probabilities of risk

- The average incidence of Pacific spider mites after packing is quoted as 11 per 100 000 and the statement is made that "this suggests that in-field infestation levels are an important factor in assessing whether fruit is likely to be contaminated" (p34). An alternative explanation of this finding might be that it presents a biosecurity risk and that the risk, in the case of a tiny exotic pest with a wide host range and capable of rapid population increase by both sexual reproduction and parthenogenesis, is likely to be unacceptable. The IRA statement also indicates mitigation measures may not be required if orchard monitoring showed low in-field infestation levels. How low is low, or should 'nil' be accepted as the benchmark for in-field detection?
- The IRA states that one to two weeks could elapse before imported fruit is sufficiently close to spider mite hosts to allow distribution and that it is unlikely that reproductively viable spider mites would survive (p35). The food deprivation study (p38) noted that at 24°C *Tetranychus urticae* mites survived two days without food before fecundity and longevity decreased, but there is no comment about mortality. An earlier comment noted that female spider mites can overwinter and survive sub-zero temperatures (p34). These conditions would be more arduous than the 1°C noted for storage of packed fruit (p34). Stone fruit are common backyard trees and disposal of potentially affected fruit could occur near preferred or alternative hosts and provide a bridge from consumers to commercial orchards.

(c) Unknowns to be further considered in assigning probabilities of risk

- Regarding natural predators of spider mites, the statement is made that "suitable natural enemies *may* be present in Australia but their potential impact on these exotic spider mites is unknown" and that mite "predators are often more susceptible to pesticides than the pests" (p37). It is also stated that spider mite populations "develop resistance to pesticides quickly". Based on current knowledge, it seems that if exotic spider mites established, control options would be either limited or short term or would be reliant upon an unknown suite of endemic predators.
- Some pests (e.g. spider mites) have a very wide host range. Heavy production losses due to exotic introductions could potentially occur in agricultural enterprises not associated with the importation pathway.

- Climatic conditions are mentioned (p42) as influencing the emergence of walnut fly from puparia. The context is that most of the stone fruit harvest will be completed prior to emergence so reducing the risk of oviposition in export fruit. Issues associated with trends toward earlier emergence because of global warming were not raised.
- In discussing consequences of, for example, exotic spider mites becoming established in Australia, the IRA notes there may be "interstate trade restrictions" and limitations placed on "access to overseas markets where these pests are not present" (p39). Similarly, regarding international trade, the IRA states "the presence of *Xylella fastidiosa* in Australia could lead to quarantine restrictions on a range of Australian fruit exports". Surely Australia at this point in time is a market where these pests are not present and yet Australia is opening market access. Not only is product access being considered, "increased costs to treat and inspect for these pests" is foreshadowed. It is contradictory that Australia should allow entry of product that would be excluded elsewhere and then incur greater costs to retain Australia's market access if those pests or diseases became established in Australia. The Commonwealth should be responsible for eradication and management costs of pests and diseases introduced into Australia on trade approved by Biosecurity Australia.

Pests

The IRA has not addressed some pest issues with sufficient rigour. Species have been lumped together for assessment. This has meant that some species have been overlooked, others are treated scantly and conclusions made regarding one species may not necessarily apply to others in the genus.

Spider mites

Spider mites, the Tetranychidae, are one of the most important families of plant-feeding mites worldwide and are renowned for having a wide host range. The IRA discusses three species of spider mite and examines them in a single assessment.

(a) Of the three species of spider mites, *Tetranychus mcdanieli*, *T. pacificus* and *T. turkestani*, the IRA claims *T. mcdanieli* and *T. pacificus* are more economically important than *T. turkestani*. This claim underestimates the importance of *T. turkestani* which has been found on more than 200 different host plants compared with *T. pacificus* and *T. mcdanieli* which have been recorded from 15 and 35 different host plants respectively. In addition to stone fruits, hosts for *T. turkestani* include citrus and cotton. *T. urticae*, a very common, non-quarantine pest, is a major pest in cotton where a constant battle is already being fought to gain control because of rapidly acquired chemical resistance. Another mite pest such as *T. turkestani* would not be welcome. Morphologically, however, *T. turkestani* is very similar to *T. urticae*. On visual inspection *T. turkestani* could very easily be misidentified as *T. urticae* and disregarded by AQIS at the border.

For potentially exotic mites to be identified, appropriately qualified and detailed diagnostic capacity is required at the border.

(b) Another important *Tetranychus* spider mite species, *Tetranychus canadensis* (McGregor) has not been considered in this IRA. Commonly known as 4-spotted mite, Canadian spider mite or Hawthorne spider mite, *T. canadensis* has been found throughout the USA and is absent from Australia. This species has been reported from 54 host plants including many *Prunus* species such as *P. americana* and *P. domestica*. It is likely to be inconspicuous if imported on stone fruits as it produces very little webbing and overwinters in the adult stage.

(c) Other spider mites have been omitted from the IRA. These include:

- *Eotetranychus pruni* (Oudemans). This species infests at least 23 host plant species including different species of *Prunus*. It is absent from Australia but its distribution in the USA includes Washington.
- *Eotetranychus carpini* (Oudemans). This species has a known host range of 27 host plant species including many different *Prunus* species. In the USA, distribution for *Eo. carpini* specifically lists California, New York, Ohio, Oregon and Washington. It has not been recorded from Australia.

(d) The IRA acknowledges that spider mites have been physically intercepted on stone fruit imports from New Zealand (p33) and interceptions have occurred "numerous times" (p34). Despite such interception evidence proving spider mites can survive packing house procedures and the Californian study that found an average of 11 mites per 100 000 fruit post-packing (p34), the overall probability of entry of spider mites on stone fruits from California and the Pacific Northwest states has been ranked as low (p36). Even though transit from the USA is longer than from New Zealand, spider mites could feasibly remain viable if they enter into an over-wintering phase and remain in the calyx area of fruit.

(e) One of the reasons cited for ranking the probability of distribution of spider mites as low (p35) is that "many of the known host plants are deciduous and therefore suitable leaves for colonising may not be readily available when stone fruit is imported" from the USA. The deciduous plant argument trivialises the range of potential spider mite hosts. Categories of plants included by the IRA are herbaceous and shrubby weeds and garden plants and many of these would not be deciduous. The assumption, that "there would be limited opportunities where suitable hosts are likely to be in close proximity to the imported commodity" (p35) is likely to be invalid.

(f) The unrestricted risk of combined probabilities and consequences for spider mites was assessed as very low and specific risk management measures are deemed unnecessary. This conclusion seems contrary to the suggestion that "in-field infestation levels [of spider mite] are an important factor in assessing whether fruit is likely to be contaminated" (p34) and shifts responsibility from pest management by the grower to pest detection by the importer.

Eriophyoid mites

Eriophyoid mites, the Eriophyidae, are tiny, ranging in size from 100 to 300 µm. They are highly host-specific. Many species are economic pests and some are capable of transmitting plant viruses.

(a) The very small size of eriophyoid mites means that they can easily avoid detection. The fact that spider mites (which are much larger) have been intercepted on stonefruit from New Zealand suggests that it is very likely that eriophyoid mites could survive around the stem or calyx of fruit in transit from the USA and remain undetected.

(b) Two important eriophyoid mites species, *Eriophyes inaequalis* and *E. insidiosus*, which do not occur in Australia, have been mentioned in the pest categorisation tables in the IRA. Both species have been discounted for further consideration on the basis that they do not normally occur on mature, fresh harvested fruit. Nonetheless, both species are known to transmit plant viruses, namely, cherry mottle leaf trichovirus (by *E. inaequalis*) and peach mosaic closterovirus (by *E. insidiosus*) and consequently may warrant further consideration.

Apple maggot

The tephritid fruit fly, apple maggot, is another pest with a wide host range and potential for serious impacts on Australian horticulture.

(a) In order to maintain market access of Australian horticulture produce to countries such as the USA, the annual expenditure by Australian states on Queensland fruit fly monitoring, control and eradication amounts to millions of dollars. In contrast to Queensland fruit fly, the IRA mentions that are no effective or selective traps to enable detection of *Rhagoletis spp.* and that immature flies which would most likely be present at port of entry respond poorly to traps (p51). The IRA also notes that treatments used in other countries might not be effective in Australia and "there is no evidence that parasoitids in Australia would attack apple maggot" (p51).

(b) The IRA may have underestimated the probability of spread as moderate (p52) if apple maggot were to establish in Australia. It is likely that the distribution of host trees would be more contiguous than implied in the IRA as hosts are readily found in urban gardens and amenity plantings. Adult flies are reported as capable of flying distances of 1.5km (p50) and human assisted transport, as for other fruit flies, would be likely.

Scale insects

As with other cryptic arthropods, scale insects are grouped together for consideration in the IRA on the basis that they are related biologically and taxonomically and may pose similar risks (p33). However, the assumption that the risks are similar could lead to an underestimation of the threats presented by some species.

(a) The IRA ranks the probability of importation of scale insects as very low (p64) but also quotes research citing the physical detection of scale insects post packing (p64). This suggests that the probability of importation is greater than very low and may even imply that importation of scales is inevitable. Scales around the stem or calyx of the fruit would not be removed by the mechanical brushes, nor easily seen.

(b) The probability of spread of scales is set at moderate but these insects are polyphagous and can be dispersed as crawlers in wind currents. By comparison, the probability of spread of mealybugs is set at high. These two groups of insects have many similar characteristics and should probably both be considered as having a high likelihood of spread.

(c) The risk assessment of scale insects fails to give due consideration to their high reproductive rates. Each female may produce up to 1 000 eggs and scale outbreaks can develop quickly. Although scale insects also have high death rates, a localised outbreak can quickly spread to nearby trees and orchards by wind dispersal of millions of crawlers and the survival of only a fraction of those crawlers.

Thrips

The section on cultural practices and control measures for thrips (p107) suggests that the main issues relating to management of thrips are application and timing of chemical insecticides and that "most thrips can be controlled by the same mitigation measures". This emphasis minimises the importance of different suites of resistance that occur within a thrips species. This means that even though a thrips species may be endemic in Australia, current control regimes could be quickly overturned if thrips of that species with a different resistance profile are introduced.

Pathogens

A small number of pathogens endemic to California, Idaho, Oregon and Washington were investigated in the IRA because of potential threats to Australian stone fruits industries. The IRA concluded that phytosanitary measures associated with normal cultural and postharvest procedures provided sufficient control over these pathogens and no additional measures would be needed to reduce the level of risk to below Australia's appropriate level of protection (ALOP). This assessment is disputed for a number of exotic pathogens which are likely to be of most concern to Australian rural industries, particularly those diseases with latent infective potential, such as *Xylella fastidiosa* and plum pox potyvirus.

Xylella fastidiosa

Strains of *X. fastidiosa* are categorised according to their ability to infect groups of hosts. The strains capable of infecting peach and plum also cause citrus variegated chlorosis (citrus pecosita) and coffee leaf scorch. Consequently, the direct relevance of this IRA reaches beyond stone fruit producers to be of concern to citrus and coffee industries. Although another strain of *X. fastidiosa* may be the cause of Pierce's disease in grapes, more work needs to be done on whether subspecies of the pathogen can cross between different hosts. A recent research paper reported that almond isolates of *X. fastidiosa* were recovered from grapes despite strong selection driven by host plant adaptation.

The probability of entry of *X. fastidiosa* has been underestimated.

(a) The IRA states that "the probability that *X. fastidiosa* will arrive in Australia *on* fruit that has undergone standard production and post-harvest practices in the USA is estimated to be very low" (p111). The most likely mode of entry of this bacterium is through systemic infection of whole fruit xylem but the wording "on" in the sentence implies that the bacterium is on the surface of the fruit and could be removed in packing processes. The IRA should assess whether *X. fastidiosa* is associated with fruit on the pathway, rather than simply "on" mature whole fruit.

(b) Scientific validation of whether *X. fastidiosa* can infect and be transmitted through seeds is urgently required. Claims such as "lack of evidence in the literature" (p111) and "bacterial levels in symptomless fruit may be low" (p111) and that "the ability of stone fruit seed to carry the bacterium and transmit it to seedlings has not been demonstrated" (p112) are too imprecise to risk Australia's pest free status from *Xylella*. Although most seeds of shop-bought fruit do not end up germinating, there are a small number of seeds that do germinate either opportunistically (e.g. around compost bins or on roadsides) or because they have been deliberately planted. Allowing this disease entry into Australia in infected seed of symptomless fruit which germinates and then expresses symptoms in seedlings, has the potential to be a ticking time bomb. Australia has many xylem feeding insects that could be potential vectors and spread a suite of diseases that may be caused by *X. fastidiosa*. The IRA notes that *X. fastidiosa* has non-specific vector relationships and numerous species of potential vectors are present in Australia (p113).

(c) The presence of the vector during transport of packed fruit (p111) is not relevant the probability of importation of *X. fastidiosa*. The presence of a vector in high numbers during harvest means that fruit infection is likely, regardless of the immediate presence of a vector in consigned fruit.

(d) The hypothesis that fruit from infected trees is unlikely to be harvested because of a disease associated decline in fruit quality (p111) is unsubstantiated. Research has shown that significant decline in fruit quality may take "several years" to occur following infection and fruit may be harvested from a tree for several years before significant symptom expression occurs.

(e) The IRA presentation of the relationship between temperature and bacterial survival is simplistic (p112). Research reports acknowledge that factors other than temperature influence survival and growth of *X. fastidiosa* in-planta. Nutrition or possible growth stimulants or inhibitors are examples. Whole stone fruit may be a favourable substrate for bacterial survival.

(f) Insufficient research has been conducted to conclude that chilling during commercial storage of stone fruit is sufficient to reduce risk. After 18 days significant numbers of *X. fastidiosa* have been recovered from host material subjected to chilling at different temperatures. Eighteen days is a period that falls within the shipping window for stone fruit. Pathogen storage protocols for *X. fastidiosa* also show no significant decrease in survival of the bacterium at -4°C.

The probability of distribution of *X. fastidiosa* has been underestimated.

(a) The presence of *X. fastidiosa* in fruit stalks is mentioned but discounted as significant (p112). Two reasons are given but both are based on uncertainties. The IRA acknowledges that "little information addressing the distribution of *X. fastidiosa* in stone fruits is available" and that "endemic potential vectors are not expected to feed on discarded fruit". Neither claim, nor the risk posed by fruit stalks, has been technically substantiated.

(b) The potential of *X. fastidiosa* to infect seeds affects the assessment of risks of distribution as well as of entry. The knowledge gaps identified under the probability of entry (see above) continue to apply and whether *Xylella* can infect seeds of fruit requires urgent confirmation.

(c) Limitations of "cold winter temperatures and suitable overwintering vectors" which are stated as the "main factors limiting the distribution and persistence of *X. fastidiosa*" (p110) are unlikely to apply in low chill production areas. On the contrary, *X. fastidiosa* is said to proliferate in environments with warm conditions and mild winters (p113). Such conditions apply in the NSW low chill stone fruit production areas.

The probability of spread of *X. fastidiosa* has been underestimated.

The comment is made (p115) that "presumably cultivar certification programs and rigorous testing could be implemented to prevent the spread of bacteria". In addition to the admission of doubt, the next point mentions "the capacity for hosts to remain asymptomatic and the difficulties of diagnostic testing". These contradictions increase the risk of spread if introduction of the pathogen occurs.

Blumeriella jaapii

B. jaapii occurs in California and the Pacific Northwest states (p118, 119) so infected fruit or stem material might enter Australia on the stone fruit pathway. The IRA notes that an incursion of this fungus in NSW was eradicated previously (p118). Consequently, the risks of entry, establishment and spread are likely to be greater than the extremely low level indicated and the risks are even greater for low chill fruit production areas in NSW. In warmer production areas young leaves emerge in July while stone fruit from California and the Pacific Northwest is expected to arrive in Australia from June until late October (p26). Contrary to the assertion that seasonal overlap presents "a narrow window, late in the US export season, when Australian trees may have their first leaves which would be susceptible to infection", the overlap period would typically be four months.

Apricot ring pox

The probability of entry is assessed as extremely low (p138). The IRA argues that symptomatic fruit would be discarded at harvest or in the packinghouse and that the pathogen is not prevalent in the exporting states. Although the pathogen is currently of limited significance in the exporting states, it has been of significance in Washington in the past. Furthermore, it is asymptomatic in some varieties of fruit. It is possible that asymptomatic fruit is still present, particularly in Washington, and would escape detection during regular packinghouse procedures. The rating of extremely low understates the probability of entry.

Plum pox potyvirus

Plum Pox potyvirus (PPV) is an extremely destructive disease of stone fruit which is present in certain areas in the eastern states of America where official controls apply. Although area freedom of the USA west coast states is the major barrier against importation of the disease, NSW growers are of the opinion that the introduction of PPV would annihilate commercial production from their districts. Such concerns influence growers' interpretations of levels of risk.

(a) Australian virus-free certification schemes for propagating material may not detect PPV. ELISA is frequently used and is not targeted at PPV. Selection of virus-free propagating material may not be straightforward. The distribution of virus in infected trees is known to be uneven and unpredictable, foliar symptoms can be difficult to detect and correct diagnosis prior to the first commercial harvest two to three years post-planting is claimed to be unlikely. During this time widespread distribution of an infected nursery batch could preclude eradication.

(b) Further research is needed to clarify the contrary evidence that has been reported in the discussion of seed transmission of PPV (p143). The IRA concluded that seed transmission is possible, although at "extremely low rates". For this disease, extremely low may still be too great a risk and the pathogen may be introduced through volunteer plants growing from discarded seeds.

(c) Although the most common mode of transmission of PPV is infected planting material rather than whole fruit, fruit transmission does occur via aphid vectors. Green peach aphid and black peach aphid, two of the more efficient vectors of PPV, are endemic to Australia. Black peach aphid is a known vector of the North American strains of PPV.

(d) The IRA reports that six strains of PPV have been identified (p143) and of these the American strain, PPV-D is "less virulent and spreads more slowly than European and Mediterranean strains". Of concern, however, is the qualifier in the statement that "nearly all American PPV isolates are PPV-D" coupled with evidence that genetic recombination or mutation to more virulent forms occurs (eg existence of PPV-Rec group) and that the virus can readily adapt to new conditions or hosts because of high mutation rates (p146). Also of concern is the acknowledgement that "the strain of the virus present in Pennsylvania has been detected in symptomless fruit" (p144).

(e) Regarding the probability of spread of PPV (p147), the statement is made that "PPV is practically limited to its host plant unless transferred by vectors". This statement minimises the significance of the large number of potential *Prunus* hosts, the wide popularity of *Prunus* plants in urban and residential planting and therefore the wide distribution of hosts. It also minimises the importance of potential vectors and the wide distribution of aphids.

(f) The IRA understates the potential effect of PPV on the environment. Contrary to the claim (p148) that "there is unlikely to be any major changes to pesticide spray regimes", establishment of PPV could lead to increased frequencies and volumes of use of aphicides, with a subsequent deterioration in integrated pest management and in turn greater use of other acaricides and insecticides. While reports indicate that "rigorous spraying for aphids may delay the spread of virus", current treatment recommendations in NSW support integrated pest management approaches. Chemical treatments for green peach aphid and black peach aphid include imidacloprid which is particularly damaging to beneficial arthropods. If this chemical must be used the recommendations are to only spot-spray sites of heavy infestation. Recent surveys of Australian orchardists provide anecdotal evidence that black peach aphid is becoming more common and more difficult to control.

(g) Consequences of eradication and control of PPV have been rated "E – significant at the regional level" (p148). PPV is a Category 2 pest under the Emergency Plant Pests Cost Sharing Deed, requiring a government : industry commitment of 80% : 20% if eradication were to be attempted. As the Deed is a national agreement, the level of significance would more appropriately be F – significant at the national level. Support for a higher rating is substantiated by the comment, under domestic trade, that "fruit movement would be restricted if PPV established in any region of Australia". The consequence rating should also be elevated from "D – significant at the district level" to E – significant at the regional level.

Operational procedures

IRAs have previously been criticised for a lack of detail in the risk management section. In this document also there is insufficient operational detail to judge the efficiency of measures for lowering risk to below Australia's appropriate level of protection (ALOP).

- The IRA claims (p160) that "it is necessary to have a system of operational procedures in place" but many uncertainties are acknowledged which negate the claim that a system exists. Examples include statements that "... Biosecurity Australia will consider any alternative treatment ..." (p159), "information is needed to support pest free areas" (p158), and the numerous qualifying "however" statements (e.g. p157).
- Too much reliance is placed on treatments which are not supported. The IRA mentions that irradiated stone fruit is not permitted to be sold in Australia (pp157, 159) and California prohibits the use of methyl bromide. The comment is pertinent that "in some cases, detailed efficacy data on treatments is not available for the quarantine pests identified and would need to be provided by the exporting country before these treatments can be finalised and final import conditions developed" (p155). In essence this means that acceptance of the IRA is founded on unknowns.

Export orchards

(a) While provision is made for auditing places of production and control measures to enable trace-back in the event of a problem (p160), there does not appear to be any provision for physical audits of the orchards as was proposed in other IRAs, such as apples from New Zealand. A schedule of disqualification from export schemes provides incentive for exporting orchardists to maintain pest control at acceptable levels. It is particularly important where symptoms of infestation are visible in-orchard (e.g. *Grapholita molesta*).

(b) The issue of collateral damage might also be addressed by requiring orchards registered for export to Australia to undertake structured monitoring or pest assessment programs for a suite of pests associated with the export commodity. This puts the responsibility on growers and exporters to know the suite of pests and diseases present at the source, rather than the onus being placed on the importer to detect them. If this were the base line 'general management measure' then the phrase 'specific management measures are not required' would be more strongly supported.

Packing

(a) Some common packing shed processes are described in the IRA
  - "All fruit" is passed over mechanically rotated coarse brush rollers to remove extraneous trash and passed over a second set of brushed rollers to remove fuzz (p27). The only exception noted is donut shaped 'peento' peaches which are hand packed. Are smooth-skinned plums and nectarines brushed?

- Concurrent washing of fruit in a mild chlorine solution was mentioned as "typical" but not "standard procedure" but chlorine dipping or washing is not mentioned as a risk mitigating phytosanitary measure (pp154ff). Has this procedure been assessed in the IRA?
- The IRA claims that normal harvest, packing house and distribution procedures are sufficient to reduce risks of entry, establishment and spread of the powdery mildew, *Podosphaera clandestina*, to below the ALOP (p132). This claim is based on infected fruit being discarded following visual inspection and disinfestation in postharvest washing and defuzzing/brushing. Post-harvest washing and de-fuzzing are likely to reduce the presence of contaminant fungal bodies, but *Podosphaera* may be an unusual case. The fungus forms mats of thick, hydrophobic mycelium and spores which are difficult to wet and adequately disinfect. Spores or mycelium may be hidden in the calyx and not detected by visual inspection nor removed by mechanical processes such as brushing. Further research may be required to ensure adequate biosecurity for the Australian cherry industry.

(b) Will stone fruit exports to Australia include US No 2 grade? US No. 2 grade is defined as "fruit free from serious damage which seriously detracts from the appearance or edible/shipping quality" of the fruit (p27). The concern is that "free from serious damage" allows the possibility of some damage or malformation and damaged fruit would carry a greater level of pest and disease risk than undamaged fruit. US Combination grade should also be excluded from the Australian export chain because the minimum requirement that 75% is US No.1 grade which allows up to 25% US No. 2 grade to be included.

(c) The IRA states that "after packing fruit is stored at around 1°C" (p49). Is this a procedural requirement in export orchards? Are records required? What is the maximum allowable time between packing and placing in cold storage?

Consignments

(a) Detail about physical characteristics of the consignments is lacking.

- The volume and type of packaging is not specified. The IRA seems to assume that post arrival storage in Australia will be in urban stores or distribution centres but if fruit is imported in bulk packaging it may be distributed to regional packing houses for secondary packaging and further distribution. Regional packing houses are usually in production areas and are often very close to orchards. This would increase the possibility of fruit being discarded in close proximity to suitable hosts. If this were the case, then, the assumption applied regarding PPV (p145), that "fruit waste would need to be discarded in a place where aphids are likely to feed on the waste. This could occur in urban or suburban gardens, but would represent a very small percentage of all imported fruit", should be revised.

- How does the fruit sampling regime protect against topping packed fruit with selected high quality or pest-free fruit. Fruit at the top of a consignment is more likely to be sampled because if samples are drawn from deeper in the consignment profile the fruit could be bruised.

(b) Treatments

- Methyl bromide fumigation is mentioned as a remedial treatment for mealybugs, leafrollers and thrips (p156), peach twig borer (p157) and *Grapholita* moths (p158) without reference to the caveat that environmental regulations preclude the use of methyl bromide in most states of the USA and that the regulations in California are extremely stringent. Treatments that cannot be used cannot "provide sufficient protection" (p158).
- For apple maggot the IRA notes an effective radiation dose to prevent pupation of third instar larvae (p157). However, the next paragraph states "irradiated stone fruit is not permitted to be sold in Australia" (p157), so inclusion of this treatment as a remedial action is invalidated. A similar caveat is made regarding *Grapholita* moths (p159).

Inspection

- The IRA mentions "visual examination" for spider mites, mealybugs and scale insects but gives no indication about how this will be undertaken. What are the specific standards that will be used and have these been made available for technical and stakeholder comment?
- Detection of mealybugs, leafrollers and thrips by "visual inspection" is presented as the trigger for remedial action to be applied. However, the likelihood of detection and activation of the trigger is very low because these arthropods are small and cryptic in behaviour.
- Would the "minute external damage from egg punctures" made by apple maggot adults be noticeable on visual inspection (p53)? Has the word "*not*" been omitted from the description in the consequences table (plant life or health)?