Submission to the Draft Import Risk Analysis Report for Table Grapes from the People’s Republic of China
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CONTEXT

Western Australian legislation currently prohibits the importation of grape material from any source. A post entry quarantine protocol is in place for propagative material.

The Department of Agriculture and Food, Western Australia (the Department) has advised Biosecurity Australia that the pathogen *Phomopsis viticola* has not been detected in Western Australia and is considered to be a quarantine pest for the State.

The Department has not accepted Biosecurity Australia’s assessment for *Phomopsis viticola* associated with the importation of table grapes from Chile. Acceptance of the Chile IRA is dependant upon the satisfactory resolution of a number of issues raised including risk analysis *Phomopsis viticola*.

A preliminary review of the draft IRA for the importation of table grapes from China has been conducted. A comprehensive review was not possible due to competing resource commitments. The satisfactory resolution of the issues in this document, previous submissions in relation to Chilean table grapes and those that arise from further discussion will be required before the Department can consider supporting the IRA and changing State legislation.

The Department submits the following preliminary comments:

Section 1- Pest Categorisation

Pest categorisation process

Biosecurity Australia’s pest categorisation process described in section 2 of the draft IRA is consistent with ISPM 11. However, the process undertaken in Appendix A1 of the draft IRA does not comply with the process described in section 2.

Reasoning

The goal of the pest categorisation process is to determine whether an organism meets the definition of a quarantine pest and is associated with the pathway under consideration. Organisms associated with the pathway and determined to be quarantine pests are considered further in a pest risk assessment.

Some organisms considered in Appendix A1 are eliminated from further consideration on the basis of elements beyond the scope of pest categorisation. The consideration of these elements should be considered during a pest risk assessment especially when assessing probability of importation.

Elements which are considered beyond the scope of the pest categorisation process include pest management, cultural and commercial procedures applied at the place of origin.

The draft IRA implies an assumption of 100% efficacy in packing house procedures. This assumption has been used as part of the basis for eliminating several of the organisms from further consideration.

Specific examples demonstrating deviation from the pest categorisation process resulting in the elimination of organisms from further consideration include:

*Anomala corpulenta* (copper green chafer). The draft IRA correctly recognises this pest as being associated with the table grape pathway. The pest is then eliminated from further consideration due to aspects which should be considered when assessing the probability of importation, that is, harvesting and post-harvest processing.
Protaetia brevitarsis (Flower beetle). The draft IRA recognises that this species can be present on the pathway as the adults feed on fruit. In this case the pest has been eliminated from further consideration for no apparent reason.

Proagopertha lucidula (Lucidula chafer). The draft IRA recognises that this species can be present on the pathway. The pest is then eliminated from further consideration due to aspects which should be considered when assessing the probability of importation, that is, harvesting and post-harvest processing.

Pentatomid, lygaeid and alydidae bugs. The draft IRA has not fully taken into consideration the interaction of disturbed pentatomid, lygaeid and alydidae bugs in relation to proximity of harvest bins to the grapevines. These insects play dead when disturbed and may fall unnoticed into the harvest bins. The draft indicates that pentatomid and alydid bugs feeding on grape clusters and other plant parts will drop off during harvest and as such these bugs have the potential to fall into harvest bins. This aspect was taken into account by Biosecurity Australia in the Import Risk Analysis for the importation of fresh apple fruit from New Zealand (Biosecurity Australia 2006).

Furthermore the draft IRA indicates that gentle harvest and postharvest procedures are required. These procedures will minimise disturbance to these types of insects once within harvest bins. Additionally, given the unique structure of grape bunches, these pest species may also lodge within tight grape clusters.

Again the justification for not considering these pests further is based on elements of the probability of importation. This suggests that pentatomid and alydid bugs have the potential to be on the mature table grape pathway and should be further assessed as a quarantine pests associated with the mature table grape pathway.

Orgyia postica (Cocoa tussock moth). This pest has been eliminated from consideration as Biosecurity Australia determined that it is not associated with the table grape pathway. However, the reasons provided are contradictory, ‘larvae preferentially feeds on fruit, including grapes’ and ‘They are unlikely to enter the pathway because they occur only on leaves and stems’.

Recommended Outcomes

1) Review of the pest categorisation process and re-evaluation of the organisms in Appendix A1 of the draft IRA using the pest categorisation process described in section 2 which complies with ISPM 11 (FAO 2004).
2) Prepare risk assessments for all quarantine pests associated with the fresh table grape pathway.
3) Protaetia brevitarsis – provide justification for elimination from further consideration
4) Consider the impact of gentle harvest and postharvest procedures and the potential for mobile pests to remain within grape bunches.
5) Orgyia postica – resolve contradictory statements relating to association with the pathway.
6) Provide stakeholders with the opportunity to comment upon the changes prior to the release of the provisional final IRA.
**Deviation from Methodology**

Biosecurity Australia has not conducted the pest categorisation according to the stated methodology. Additionally, Biosecurity Australia is inconsistent with the approach taken for the importation of table grapes from Chile. In the Chile grape IRA Biosecurity Australia considered seed borne pests to be on the pathway.

**Reasoning**

Section 2 of the draft IRA correctly indicates the procedures for undertaking the pest categorisation process in accordance with ISPM 11. However, the process undertaken in Appendix A1 does not adhere to these procedures in all cases.

Page 5 of the draft IRA states ‘The pests assessed for their potential to be on the exported commodity (produced using commercial production and packing procedures) are listed in column 1 of Appendix A. Appendix A does not present a comprehensive list of all the pests associated with the entire plant, but concentrates on the pests that could be on the assessed commodity’. Seeds form part of the exported commodity, therefore, if Biosecurity Australia adheres to their stipulated approach pests associated with table grape seed should be included in Appendix A.

Page 207 of the draft IRA states ‘This pest categorisation table does not represent a comprehensive list of all the pests associated with the entire plant of an imported commodity. Reference to soilborne nematodes, soilborne pathogens, wood borer pests, root pests or pathogens, and secondary pests have not been listed or have been deleted from the table, as they are not directly related to the export pathway of table grapes and would be addressed by Australia’s current approach to contaminating pests.’ Seed borne pests have not been excluded in this explanatory comment regarding the methodology used for pest categorisation.

**Recommended Outcomes**

1) Review the pest list and pest categorisation to include seed borne pests.
2) Provide stakeholders with the opportunity to comment upon the changes prior to the release of the provisional final IRA.

**Grape seeds are part of the pathway**

The Department considers seeds contained with fruit as forming part of the fresh fruit pathway.

**Reasoning**

The ISPM definition of pathway is ‘any means that allows the entry or spread of a pest’.

Biosecurity Australia scope of the draft IRA is to consider the risk associated with the import of table grapes from China. Biosecurity Australia clarify that table grapes are defined as ‘table grape bunches or clusters, which include peduncles, rachises, laterals, pedicels and berries but not plant parts’. Seeds are contained within the berries in seeded grape varieties.

The same definition of table grapes was used in the final IRA for the importation of fresh table grapes from Chile.

In the Chile table grape IRA Biosecurity Australia considered seed borne pests as being on the pathway. For example, the pest categorisation for tomato ringspot nepovirus stated ‘no evidence to suggest this virus is seed borne in table grapes’.

**Recommended Outcomes**

1) Biosecurity Australia reviews the pest categorisation stage and include pests associated with seeds and conducts pest risk assessments where necessary.

DAFWA (2010) Department of Agriculture and Food, Western Australia submission to the draft import risk analysis report for table grapes form the People’s Republic of China. 53pp
2) Provide stakeholders with the opportunity to review and comment upon any changes and subsequent risk assessments prior to release of the provisional final IRA.

Pest categorisation inconsistency

Aspects of the pest categorisation process conducted in Appendix A1 of the draft IRA are inconsistent.

Reasoning

When assessing the potential for an organism to be associated with the table grape pathway, the draft IRA refers to grapes as the species *Vitis vinifera* or as the berry or fruit of *V. vinifera*. This can lead to confusion.

Added confusion is created when the definition of table grapes in the scope is ‘*all the commercially-produced table grapes (Vitis spp) and varieties…*’ not just *V. vinifera*.

In some cases a justification used to support a claim that a pest is not associated with the pathway is used for another pest to support a claim that it is associated with the pathway. For example, *Rhipiphorothrips cruentatus* and *Stathmopoda auriferella* were determined to be associated with the pathway on the basis that ‘*they can also attack blossoms and developing berries*’ and ‘*Larvae also burrow into the green berries*’. *Bromius obscurus*, *Nysius ericae* and *Illiberis tenuis* attack developing (or young) berries and have been determined as not being associated with the pathway.

There are inconsistencies between the categorisation of pests in the Chile and China grape IRAs. For example, *tomato ringspot nepovirus* was not considered to be seed borne in the Chile IRA but is in the China IRA.

Recommended Outcomes

1) Consistent uniform descriptors should be used for *V. vinifera* and its parts to avoid confusion and improve robustness.

2) Adoption of a consistent reference to the species and varieties of table grape under consideration in the draft IRA.

3) *Tomato ringspot nepovirus* – review the differences between Chile and China grapes pest categorisation. Depending upon the outcomes of the review it may be necessary to modify the Chile IRA.

4) Resolve inconsistent outcome for pests associated with developing (or young) berries.

Section 2 - Risk Assessment

Oriental fruit fly

The probability of distribution of ‘Low’ assigned to *Bactrocera dorsalis*, is inconsistent with previous assessments of the pest and is inconsistent when compared to other pests considered in this IRA.

Reasoning

The ‘Low’ probability of distribution is significantly lower than the ‘High’ probability of distribution assigned to *Bactrocera dorsalis* in the recent draft IRA for apple fruit from China (BA 2010; Biosecurity Australia 2010) which has similar origin and distribution pathway. The draft IRA has in no way justified this substantial reduction in the probability of distribution.

The ‘Low’ probability of distribution for *Bactrocera dorsalis* seems at odds with probabilities of distribution assigned to other assessments within the draft IRA. For example, the moth *Stathmopoda auriferella* has a ‘High’ probability of distribution. Both the fruit fly and the moth have larvae that need to emerge from the fruit, pupate...
and emerge as adults to find a suitable mate and host plant to complete the distribution pathway.

Recommended Outcomes

1) This substantial reduction in the probability of distribution be appropriately justified or reverted back to previous assessments of a ‘High’ probability of distribution.

2) Although the Department acknowledges that a reversion back to a ‘High’ probability of distribution will not change the assessment outcome of the unrestricted risk being above Australia’s ALOP, it may require a change in the strength of the proposed phytosanitary measures.

3) Consider the impact of the differences in definition for distribution.

Variation in distribution definitions

Variations in the definition for distribution used in the Chile and China grape IRAs need to be taken into account when assessing the probability of distribution. The Department considers the different definitions would act to increase the probability of distribution for pests under the definition provided in the China grapes IRA.

Reasoning

The endangered area is defined in ISPM 5 (FAO 2007) as ‘an area where ecological factors favour the establishment of a pest whose presence in the area will result in economically important loss’. The PRA area is defined as ‘area in relation to which as pest risk analysis is conducted’. Therefore, the endangered area may be a subset of the PRA area.

Biosecurity Australia defines the PRA area as ‘Australia for pests that are absent, or of limited distribution and under official control. For areas with regional freedom from a pest, the ‘PRA area’ may be defined on the basis of a state or territory of Australia or may be defined as a region of Australia consisting of parts of a state or territory or several states or territories’. It appears from the P. viticola risk assessment in the China grape IRA that the PRA area for this pathogen is Western Australia.

Definition of distribution in the Chile grape IRA is ‘the probability that the pest will be distributed (as a result of the processing, sale or disposal of the commodity) to the endangered area, and subsequently be transferred to a suitable site on a susceptible host’. Definition in the China grape IRA is ‘the probability that the pest will be distributed, as a result of the processing, sale or disposal of the commodity, in the PRA area and subsequently transfer to a susceptible part of a host’. That is, in the Chilean grape IRA the distribution endpoint was restricted to transfer to a suitable site on a susceptible host in the endangered area, whereas in the China grape IRA the endpoint is expanded to a susceptible host anywhere in Western Australia.

The endangered area has not been clearly defined in either the Chilean or Chinese grape IRAs. However, in the case of Phomopsis viticola the endangered area could be interpreted to be a subset of PRA area. This interpretation is based on the definition of endangered area, previous climate matching undertaken by the Department and the distribution of host plants in Western Australia.

The requirement of a successful event (transfer to a suitable site on a susceptible host in the endangered area) in the Chile grape IRA is more restrictive than the requirement for a successful event (transfer to a susceptible host in the PRA area) in the China grape IRA. In other words a successful event is more likely to occur when using the definition of distribution provided in the China grape IRA.
Recommended Outcomes
1) Consistency between IRAs to facilitate comparisons.
2) Review the draft IRA for impact upon the probability of distribution for other quarantine pests, taking into account the influence of the different definitions in particular the increased probability of distribution for China grapes
3) Biosecurity Australia to liaise with the Department (and other states and territories) to achieve an agreed and consistent application of definitions

**Probability of establishment**
The probability of establishment may differ between the Chilean and Chinese table grape IRAs.

Reasoning
The endpoints of distribution for the Chile grape (Biosecurity Australia 2005) and the China grape IRAs are different. This may result in difference in probability of establishment due to differing starting points for establishment between the two IRAs.

Recommended Outcomes
1) Review the probability of establishment for all pests in the China IRA given the endpoint of distribution differs between the Chile grape IRA and the China grape IRA.
2) Provide stakeholders with the opportunity to review and comment on any changes prior to the release of the provisional final IRA.

**Section 3- Phytosanitary Measures**
The Department has not undertaken a thorough review of the document. The following comments on phytosanitary measures are preliminary.

**Area freedom for Bactrocera dorsalis**
The Department accepts the principle of the various area freedoms. However, the limited official control measures in place in China to prevent the spread of *B. dorsalis* especially via non-commercial fruit carried by people from the southern Chinese provinces needs to be addressed.

Reasoning
Under ISPM 4 (FAO 1995) there are three main aspects for establishing and maintaining area freedoms. These are systems to establish freedom, phytosanitary measures to maintain freedom and checks to verify freedom has been maintained.

China’s current regulations only cover the commercial movement of plants and plant productions but not for the movement of plants and plant products by passengers travelling domestically.

Any area freedom proposal for *Bactrocera dorsalis* the proposal would need to clearly identify how the requirements under the relevant ISPMs (ISPM 4, 10 and 26) (FAO 1995; FAO 1999; FAO 2006a) are met.

The domestic restrictions for the control movement of regulated articles into a Fruit Fly Pest Free Area (FF-PFA) is a requirement for the establishment and maintenance of a FF-PFA under ISPM 26 guidelines for the establishment of pest free areas for fruit flies (Tephritidae) (FAO 2006b).

Recommended Outcomes
1) Close involvement and active participation of the Department in the development, establishment and implementation of any area freedom protocols.

2) Provide stakeholders with the opportunity to review and comment on any area freedom proposals prior to their adoption and implementation.

**SO\textsubscript{2}/CO\textsubscript{2} fumigation or sulphur pad treatment**

Efficacy data should be supplied to demonstrate the efficacy of this treatment for grape phylloxera (*Daktulosphaira vitifoliiae*). Without this data the Department would not be in a position to support this measure.

**Reasoning**

When evaluating options for pest risk management several factors are considered. These are identification of options, evaluation of the efficiency of those options and identification of the most appropriate option.

Phytosanitary measures mitigate unacceptable levels of risk. Phytosanitary measures are required to be cost-effective, feasible, adhere to the principle of equivalence and non-discrimination and be the least restrictive to trade while reducing risk to an acceptable level.

Efficacy of phytosanitary measures will impact upon the capacity of the measure to adequately reduce risk to an acceptable level.

For the proposed management of Grape phylloxera (*Daktulosphaira vitifoliiae*) by sulphur pad treatments or pre-shipment fumigation with SO\textsubscript{2}/CO\textsubscript{2}, no efficacy data was present in the draft IRA.

**Recommended Outcomes**

1) Provision of suitable efficacy data for consideration and comment by stakeholders prior to release of the provisional draft IRA.

**Section 4 - Phomopsis viticola**

The Department provided several submissions to Biosecurity Australia in relation to *Phomopsis viticola* associated with the importation of table grapes from Chile. This current submission takes into consideration the results of previous work conducted in relation to Chilean table grapes and new information presented by Biosecurity Australia.

Western Australia does not import table grapes form any source and a post-entry quarantine protocol is in place for propagative material imported into Western Australia. Surveillance of the grape production areas has not resulted in the detection of *P. viticola* in Western Australia.

**Pest Categorisation**

**Phomopsis taxon in China**

The Department believes that it is unlikely that *Diaporthe australiacanifica* is the taxon present in China.

**Reasoning**

Based on the severity of symptoms from other regions of the world ‘it is generally accepted that Phomopsis viticola is the more common form’ (DAWA 2005).

‘*Phomopsis viticola* has been reported from China in all grape production areas and causes significant damage in some areas (Zhang 2005b).’ (Biosecurity Australia 2010)

*Phomopsis viticola* ranked seventh out of eleven main diseases in China (Shao-Hua 2000).
The symptoms observed in China fit with Phomopsis cane and leaf spot disease, which is caused by *P. viticola*, as *Diaporthe australafricana* is thought to be an endophyte (Rawnsley et al., 2004).

Recommended Outcomes
1) Clarification of this position in the provisional final IRA

**P. viticola type 2**

Appendix 1A *Phomopsis viticola* statement associated with presence within Australia should be modified by removing reference to *Phomopsis viticola* ‘Type 2’ and undertaking a pest categorisation for *Diaporthe australafricana*.

Reasoning

Biosecurity Australia state that the ‘Phomopsis taxon present in Western Australia [is] (Diaporthe australafricana)’ on page 164 of the draft IRA.

The Department’s submission to the draft IRA for Chilean grapes included information regarding the suggested nomenclature of *Diaporthe perjuncta* for *Phomopsis viticola* type 1 isolates from Australia.

The Department accepts Biosecurity Australia’s use of the name *Diaporthe australafricana* to refer to South African and Australian isolates formerly treated as *D. perjuncta* as proposed by van Niekerk et al. (2005a).

It appears as though the retention of the reference to *Phomopsis viticola* type 2 in Appendix 1A is an oversight.

The inclusion of *Diaporthe australafricana* and the removal of references to Phomopsis viticola type 2 would increase transparency, completeness and robustness of the IRA.

Recommended Outcomes
1) Remove reference to *Phomopsis viticola* type 2 from Appendix 1A
2) Include *Diaporthe australafricana* in Appendix 1A, the Department acknowledges that this pathogen will not meet the definition of a quarantine pest and will not need to be considered further.

**P. viticola host range**

The status of *Vaccinium* spp as a host of *P. viticola* may need to be considered.

Reasoning

A study by Espinoza *et al.* (2008) indicated that *P. viticola* may persist as an endophyte in *Vaccinium* spp (blueberry stems).

*P. australafricana* appears to be pathogenic to blueberry (Espinoza *et al.* 2008)

Recommended Outcomes
1) Biosecurity Australia considers this information and clarifies the situation.
2) Conduct a comprehensive literature review for information published since the revised draft IRA for Chilean grapes was completed.
3) The Department is closely involved in the reviews.
Probability of Importation

Inconsistent assessments comparison of pathogens

Biosecurity Australia’s risk assessment for *Phomopsis viticola* is inconsistent with other risk assessments in the draft IRA, resulting in an underestimation of the risk posed by *P. viticola*.

There are significant differences in likelihoods assigned and very little difference in the justification present in the draft IRA for the likelihoods for *P. viticola* when compared to other pests in the analysis. These differences are sufficient for one pest to exceed the ALOP and therefore measures are required to fall below the ALOP.

Reasoning

Qualitative methodology is conceptually simple and the descriptors themselves remain effectively ‘undefined’. Consequently, it is impossible to state precisely what is meant by each descriptive designation as individuals interpretation of the descriptive terms may vary. For example, a designation of ‘low’ described as ‘the event would be unlikely to occur’ will probably be interpreted differently by different assessors.

This characteristic of qualitative methodology may lead to inconsistencies both within an IRA and between IRAs. This was recognised by Biosecurity Australia in the guidelines for import risk analysis (Biosecurity Australia 2001).

Due to the inherent shortcomings in qualitative methodology the Department compares risk assessments to gain an understanding of the criteria used by Biosecurity Australia when allocating qualitative probabilities.

The Department conducted a comparison of *P. viticola* and other pathogens for likelihood of importation. A comparison between *Physalospora baccæ* and *P. viticola* has been included as Appendix 1. Using this as an example it appears as though *P. viticola* has been under estimated.

Recommended Outcomes

1) Revise the probability of distribution ensuring a consistent approach is used when *P. viticola* is compared to other pests in the IRA.
2) Provide stakeholders with the opportunity to review the changes and provide comments prior to the release of the provisional final IRA.

*P. viticola detection on arrival*

The Department does not consider this sufficient justification for a lower likelihood of importation than for other pests in the IRA.

Reasoning

*Phomopsis viticola* is present in most grape growing regions of the world and, unless under official control in those growing regions, does not meet the definition of a quarantine pest. Regardless of the association of this pest on the table grape pathway, it is unlikely that international trading partners would target this pest during on-arrival inspection.

*Phomopsis viticola* has been detected on-arrival in international trade (Raudoniene & Lugauskas 2005).

Visual inspection for pathogens is unreliable. Asymptomatic infection may occur. Additionally, the inoculum of plant pathogens may not be visible. Inoculum may be present in the absence of disease symptoms and remain undetected.
Reference to detection or otherwise in international trade for other pathogens in the draft IRA has not occurred. This is another unjustified inconsistency between the assessments of *P. viticola* and other pathogens in the draft IRA.

**Recommended Outcomes**

1) A consistent approach is used by Biosecurity Australia when considering all pests.
2) Review the probability of importation given the record of detection of *P. viticola* upon arrival in the destination country.
3) Provide stakeholders with the opportunity to review and comment on any changes prior to the release of the provisional final IRA.

**Probability of Distribution**

**P. viticola distribution rating**

The probability of distribution for *P. viticola* in the China grape IRA is too low.

**Reasoning**

The Department argued that the probability of distribution of ‘low’ assigned to *P. viticola* by Biosecurity Australia in the revised draft IRA for grapes from Chile was too low on the basis that:

- Not all information pertinent to determining the probability of distribution was presented in the revised draft pest risk assessment (see appendix 2).
- Qualitative methodology is conceptually simple and the descriptors themselves remain effectively ‘undefined’. Consequently, it is impossible to state precisely what is meant by each descriptive designation as individuals interpretation of the descriptive terms may vary. For example, a designation of ‘low’ described as ‘the event would be unlikely to occur’ will probably be interpreted differently by different assessors.
- This characteristic of qualitative methodology may lead to inconsistencies both within an IRA and between IRAs. This was recognised by Biosecurity Australia in the guidelines for import risk analysis (BA 2001).
- Due to the inherent shortcomings in qualitative methodology the Department compares risk assessments to gain an understanding of the criteria used by Biosecurity Australia when allocating qualitative probabilities.
- A comparison of justifications used to determine the probability of distribution between *Phomopsis viticola* and other pests in the revised draft IRA for the importation of grapes from Chile and other (at that time) recent IRAs demonstrated significant unexplained variations between supporting information and subsequent probability rating (see appendix 3).
- The Department indicated that the probability of distribution for *Phomopsis viticola* should be at least ‘moderate’ and provided Biosecurity Australia with supportive justifications for this claim (see appendix 4).
- Despite the Departments submission to the revised draft IRA the probability of distribution in the final IRA for grapes from Chile was reduced to ‘very low’.

Biosecurity Australia stated that the probability of distribution for *P. viticola* associated with grapes from China is based upon the Chile grape risk assessment ‘the assessment of *P. viticola* presented here builds on the previous assessments’
As previously demonstrated, the differences in the definition of distribution used in the two IRAs results in an increased potential for distribution of *Phomopsis viticola* in the China grape IRA.

**Recommended Outcomes**

1) Revise the probability of distribution ensuring a consistent approach is used when *P. viticola* is compared to other pests in the IRA.
2) Provide stakeholders with the opportunity to review the changes and provide comments prior to the release of the provisional final IRA.

**Probability of Establishment**

*Questions establishment being same for Chile and China for Phomopsis viticola*

The Department disagrees with the statement on page 163 of the China IRA that ‘the probability of establishment and spread of *P. viticola* after arrival in Australia would be similar for table grapes shipped from Chile and China, as would the consequences if the pathogen were to spread. Accordingly, there is no need to reassess those components.’

**Reasoning**

Distribution has been defined differently in the two import risk analysis documents. The endpoint (that is the starting point for establishment) is significantly different. This difference should be taken into account when considering establishment.

The Department agrees that in principle spread and consequences for pests associated with both China and Chile grapes would be the same.

Additionally, there appears to be recent new information available which may impact upon the probability of establishment, spread and possibly consequences. This new information would apply to both the Chile and China grape IRAs. For example, Urbez-Torrez *et al.* (2009) present a case that *P. viticola* is capable of colonising mature wood to cause ‘cankers’ that affect vascular tissues and can cause grapevine dieback. This is the first study to show pathogenicity to mature lignified wood (that is, canes). *P. viticola* has previously been isolated from surface type 'lesions' on green tissues and dormant canes (multiple uncited authors), and 'pruning wounds' and 'internal wood' of mature canes (van Niekerk *et al.* 2005b).

**Recommended Outcomes**

1) Review the probability of establishment given the different endpoints of distribution for Chile and China grapes.
2) Provide stakeholders with the opportunity to review the changes and provide comments prior to the release of the provisional final IRA.
3) Conduct a comprehensive literature review for information published since the revised draft IRA for Chilean grapes was completed.
4) The initiation and completion of a review of *P. viticola* associated with all grape sources.
5) The Department is closely involved in the reviews.

**Section 5 - Seed borne pathogens**

*Reports of naturalised and weedy grapevines in Australia*

There are records of grapevine establishing or becoming weedy in Australia. The Department does not support the claims that ‘*Infected grapevine seedlings are unlikely to establish* (see Chapter 4). The absence of reports of naturalised and weedy grapevines in Australia suggests that most seeds will not germinate and the small number of seedlings that
may grow do not survive.’ and ‘nor were reports found of Vitis spp. being naturalised or invasive in any area of Australia’

Reasoning/supporting evidence

There are several herbarium specimens of *Vitis vinifera* from Western Australia collected in uncultivated situations (see appendix 5). The specimens include references to vines with seedlings (Western Australian Herbarium 1998-).

The naturalised flora of New South Wales indicates that the *Vitis vinifera* is naturalised in New South Wales and Western Australia (Botanic Gardens Trust 2010).

Richardson *et al.* (2006) state that *Vitis vinifera* is ‘becoming a weed along roadsides and disturbed sites’ in New South Wales, Victoria and Western Australia.

**Recommended Outcomes**

1) Reconsider establishment of vines from grape seeds to be likely.
2) Consider seed borne pathogens as being associated with the pathway and where necessary conduct a risk assessment for those pathogens.
3) Provide stakeholders with the opportunity to review the changes and provide comments prior to the release of the provisional final IRA.

**Consideration of intentional seed germination**

The potential for intentional germination of grape seed sourced from fresh table grapes needs to be considered.

**Reasoning**

Intentional germination of grape seeds following the purchase of table grape bunches could occur.

There are consumers who would consider and attempt to grow grapes from seeds for backyard vines. These consumers may be prepared to take a chance of inferior berries and may see growing grapes from seed as a cheaper alternative to purchasing readily available vines. The potential for growing varieties which are not readily available may add extra incentive.

Information on germinating grapes from seed is readily available from the internet. A Google search (14 April 2010) using the terms grapevine seed germination resulted in 59 700 hits. A Google search (14 April 2010) using the phrase “grow grapes from seeds” resulted in 55 100 hits.

**Recommended Outcomes**

1) Include the potential for intentional germination of grape seeds in the IRA.
2) Provide stakeholders with the opportunity to review the changes and provide comments prior to the release of the provisional final IRA.

**Cool storage and stratification**

Cool storage of grapes pre-shipment, during transportation to Australia, during distribution and storage prior to sale and following purchasing of the grape bunches acts to stratify the seeds. This has not been taken into account in the section on grapevine seed germination and seed-transmitted pathogens.

**Reasoning**
As stated in the draft IRA ‘Successful stratification is usually achieved by storing seed at 0-5°C for two months or longer’.

Grapes undergo pre-cooling storage at -2°C to -0.5°C depending upon variety for 12-24 hours.

Grapes are stored at temperatures ranging between 0.5°C to 1°C.

Grapes from Xinjiang 4-7 days to reach the nearest seaport.

Shipping transport to Australia from China can take 2-6 weeks depending upon departure and arrival ports (perishable fresh horticultural commodities usually take 2-3 weeks).

‘Cool storage technologies can extend supply for a further six to twelve weeks depending upon variety’ (DAFWA 2006).

Grapes can be stored following purchase for several weeks if refrigerated and stored in an air tight container.

As stated in the draft IRA ‘germination rates of up to 33% from seed from fresh untreated berries of some cultivars have been reported’, that is, without stratification.

Recommended Outcomes
1) Provide stakeholders with the opportunity to review the changes and provide comments prior to the release of the provisional final IRA.
2) Reconsider the potential for germination and establishment of Vitis spp

Grapevine germination and scope
The consideration of grapevine seed germination by Biosecurity Australia appears limited to Vitis vinifera this is inconsistent with the scope.

Reasoning
Based on the scope, the draft IRA ‘assesses all the commercially-produced table grapes (Vitis spp.)…’

China grape production is not limited to V. vinifera

The section considering seed germination makes no mention of non V. vinifera table grapes.

Recommended Outcomes
1) Review the IRA to clearly consider all commercially-produced table grapes in China not just Vitis vinifera.

Seed borne pathogens
There are 6 seed borne pathogens that should undergo a risk assessment. Of these 6 pathogens 4 are regional pests for Western Australia. Failure to consider these pathogens may expose Western Australia to an unacceptable level of risk.

Reasoning
Due to the cool storage of grapes, potential for some grape seed to germinate in the absence of stratification and the evidence of naturalisation or establishment of Vitis spp in Western Australia that seed borne pathogens are associated with the pathway.

Biosecurity Australia has eliminated the following seed borne pathogens from consideration:
- Grapevine yellow speckle viroid 1 (regional pest)

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- Grapevine yellow speckle viroid 2 (regional pest)
- Grapevine yellow speckle viroid 3
- Citrus exocortis viroid (regional pest)
- Grapevine fanleaf virus (regional pest)
- Tomato ringspot virus

Recommended Outcomes
1) Consider these pathogens as being associated with the pathway.
2) Prepare risk assessments for these pathogens.
3) Provide stakeholders with the opportunity to review and provide comments on the changes prior to the release of the provisional final IRA.

Section 6 - Pest plants

Pest plants

Seeds are routinely intercepted on table grapes. Pest plants associated with grape bunches should be carefully considered in the IRA. These seeds may pose an unacceptable risk to Australia’s primary industries and environment.

Reasoning
New Zealand has regularly intercepted seeds on table grapes imported into New Zealand from other countries. These detections occur despite an import requirement for grape bunches to arrive in New Zealand free of regulated weed seeds (Biosecurity New Zealand 2009).

New Zealand has found that ‘most seeds intercepted on table grapes are in the families Zygophyllaceae, Poaceae and Asteraceae’ (Biosecurity New Zealand 2009).

Biosecurity Australia considered pest plant seeds in the IRA for grapes from Chile.

In addition to the consequences associated with the establishment of weed species, seeds associated with grape bunches may provide a pathway for the entry of seed borne pathogens.

Recommended Outcomes
1) Consider pest plants in the IRA consistent with the Chile grape IRA.
2) Provide stakeholders with the opportunity to review and provide comments on the changes prior to the release of the provisional final IRA.

Pest plants (national)

There are 52 weed species that are present in Chinese grape growing regions and have five or more weed references. Forty of these species have references indicating they are weeds of agriculture.

Reasoning
See appendix 6

Recommended Outcomes
1) Consider pest plants in the IRA consistent with the Chile grape IRA.
2) Provide stakeholders with the opportunity to review and provide comments on the changes prior to the release of the provisional final IRA.
Pest plants (regional)

There are 128 species present in China and other Australian States and Territories that are Declared Plants or Quarantine weeds in Western Australia that may be associated with the importation of table grapes.

Reasoning

See appendix 6

Recommended Outcomes

1) Consider pest plants in the IRA consistent with the Chile grape IRA.
2) Provide stakeholders with the opportunity to review and provide comments on the changes prior to the release of the provisional final IRA.
REFERENCES


DAFWA (2006). *Bulletin 4626 Table grapes from Western Australia at a glance*. Department of Agriculture and Food, W.A. State of Western Australia, pp. 6.

DAWA (2005). *Comments on the revised draft import risk analysis report for the importation of table grapes from Chile*. Department of Agriculture, Government of Western Australia.


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## APPENDIX 1

**LIKELIHOOD OF IMPORTATION COMPARISONS BETWEEN PHOMOPSIS VITICOLA AND OTHER PATHOGENS CONSIDERED IN THE DRAFT IRA FOR THE IMPORTATION OF GRAPES FROM CHINA**

<table>
<thead>
<tr>
<th>Dot Point</th>
<th>BA's supporting information for <em>Physalospora baccae</em></th>
<th><em>P. viticola</em> comparison</th>
<th>Effect on likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Physalospora baccae</em> is present across the major grape growing regions of China (Li 2001) including the provinces: Liaoning, Hebei, Henan, Shandong, Anhui, Jiangsu and Zhejiang (AQSIQ 2009c).</td>
<td>Biosecurity Australia recognises that <em>Phomopsis viticola</em> ‘has been reported from China in all grape production areas’, not just the major grape growing regions.</td>
<td>On consideration of this point only it could be argued that <em>P. viticola</em> has a greater potential for importation than <em>P. baccae</em>. Therefore this point does not justify the lower rating assigned to <em>Phomopsis viticola</em>.</td>
</tr>
<tr>
<td></td>
<td>It generally only causes serious damage in areas with poor horticultural practices in seasons that are warm and wet (Zhang 2005b; BAIKE 2009; NYZSW 2009).</td>
<td>Biosecurity Australia stated that <em>Phomopsis viticola</em> ‘causes significant damage in some areas’ Shao-Hua (2000) reported that <em>Phomopsis viticola</em> (as Cryptosporella viticola) is a main grape disease in China. According to incidence in China Shao-Hua (2000) ranked this pathogen to be seventh out of eleven main grape diseases. <em>Physalospora baccae</em> was ranked ninth.</td>
<td>On consideration of this point only it could be argued that <em>P. viticola</em> has a greater potential for importation than <em>P. baccae</em>. This point does not justify the lower rating assigned to <em>Phomopsis viticola</em>.</td>
</tr>
<tr>
<td></td>
<td>Grapes may be sourced and exported from any region in China.</td>
<td>This applies to <em>Phomopsis viticola</em>.</td>
<td>Equivalent – therefore not a justification for the difference in likelihoods assigned between <em>P. viticola</em> and this pathogen.</td>
</tr>
<tr>
<td>2</td>
<td><em>Physalospora baccae</em> overwinters as pycnidia and perithecia on infected peduncles, pedicels and fruit</td>
<td>Biosecurity Australia states that <em>Phomopsis viticola</em> ‘overwinter in infected canes and <em>P. viticola</em> can remain active in trash on the</td>
<td><em>Phomopsis viticola</em> can overwinter. <em>P. viticola</em> can remain active in trash on the</td>
</tr>
</tbody>
</table>

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as well as on fallen leaves and trash within the vineyards.

It can also overwinter as mycelia in the infected tissues and produce perithecia the next spring (BAIKE 2009; NYZSW 2009).

Furthermore, as stated in the Department’s submission to the revised draft IRA for grapes from Chile ‘Some infections of the shoot may never develop symptoms but will produce pycnidia during the dormant seasons (Pscheidt & Pearson 1991). It is therefore reasonable to conclude that infections of the rachis may not develop symptoms but will produce pycnidia during the dormant season.’

The submission also stated that ‘…dead canes may produce pycnidia for at least three years (CABI 2004; Moller & Kasimatis 1981) and pycnidia have been reported to overwinter on infected rachises as well as dormant canes (Ellis & Erincik 2002; Pscheidt & Pearson 1991), infected rachis have the capacity to produce pycnidia until they breakdown.’

Krol (2006) states ‘Phomopsis viticola overwinters as mycelium in grapevine canes and buds or as pycnidia partly immersed in diseased tissue.’

In the Department’s submission to the Chilean grape revised draft IRA we stated ‘Infected material can continue to produce conidiomata and conidia for at least three seasons (CABI 2004; Moller & Kasimatis 1981)’

| 3 | During periods of wet weather in spring when temperatures rise, overwintered pycnidia and rachises on the vine. | Biosecurity Australia in the China IRA stated that ‘In spring, mature conidiomata erupt from orchard floor as “…dead canes may produce pycnidia for 3 years’, and these are likely to be pruned out. At the very least these two pathogens are equivalent. P. viticola could be higher. These points do not justify the lower rating assigned to P. viticola when compared to P. baccae. |

As ascospores are wind blown they could disseminate more thoroughly.
<table>
<thead>
<tr>
<th>perithecia of <em>P. baccae</em> release conidia and ascospores (BAIKE 2009; NYZSW 2009).</th>
<th>infected tissue and during rain, water-borne alpha-conidia are exuded'.</th>
<th>within an orchard than conidia which mainly rely upon water for dispersal. However, droplets containing conidia may be windblown. In low rain fall conditions the spread of <em>P. baccae</em> through ascospore dispersal between vines within a vineyard, would be greater than spread of <em>P. viticola</em> by conidia. However, each fungus has a way to infect a grapevine or bunch within a vineyard. Furthermore, Shao-Hua (2000) rated <em>P. viticola</em> seventh out of eleven main pathogens of grapes in China. <em>P. baccae</em> rated ninth. This point does not justify the lower rating for importation assigned to <em>P. viticola</em> when compared to <em>P. baccae</em>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind, rain and insects spread the conidia and ascospores to infect grape clusters in May and June (Zhang 2005b).</td>
<td>In the China IRA Biosecurity Australia stated that <em>Phomopsis viticola</em> 'conidia may also be blown in water droplets or spread by insects onto young vine foliage or flower-bunches'.</td>
<td>Each fungus has the ability to spread via different types spores to uninfected growth on an infected vine, or to uninfected vines. Shao-Hua (2000) rated <em>P. viticola</em> seventh out of eleven main pathogens of grapes in China. <em>P. baccae</em> rated ninth. This point does not justify the lower rating for importation assigned to <em>P. viticola</em> when compared to <em>P. baccae</em>.</td>
</tr>
<tr>
<td>Symptoms start to appear in July, with the peak disease period from July to September when the weather is warm and humid</td>
<td>The classical symptoms of <em>P. viticola</em> are not always seen when the pathogen is diagnosed on diseased plants (Balasubramaniam 1997) Although, visual symptoms of <em>P. viticola</em> on fruit can occur close to harvest (August to October), recently infected bunches may be asymptomatic. Infected leaves may not develop symptoms until they become senescent. Some infections of the shoot may never develop symptoms but will produce pycnidia during the dormant season (Pscheidt &amp; Pearson 1991)</td>
<td>It could be argued that the potential for asymptomatic infections means <em>P. viticola</em> has a greater potential for importation than <em>P. baccae</em>. This point does not justify the lower rating assigned to <em>P. viticola</em>.</td>
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<td>---</td>
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<tr>
<td>Fruit are likely to develop disease from when they start to ripen until harvest</td>
<td>Biosecurity Australia state ‘Visual symptoms first appear close to harvest when infected berries turn brown and shrivel’ The comment for <em>P. baccae</em> states ‘develop disease’. This does not indicate when symptoms become evident.</td>
<td>Probably equivalent. This point does not justify the lower rating assigned to <em>P. viticola</em>.</td>
</tr>
<tr>
<td>The reported timing suggests a period of symptomless infection of two months or more, i.e. from May until July. No other information was found concerning symptomless infection, but it was considered that it might occur after July.</td>
<td>Symptomless infection of <em>P. viticola</em> associated with bunches may occur during harvesting.</td>
<td>It could be argued that the potential for asymptomatic infections means <em>P. viticola</em> has a greater potential for importation than <em>P. baccae</em>. Therefore this point does not justify the lower rating assigned to <em>P. viticola</em>.</td>
</tr>
<tr>
<td>Fungicide applications may delay and modify or mask symptom expression</td>
<td>Biosecurity Australia does not specifically mention whether the application of fungicides may have a similar effect</td>
<td>Potentially increases the potential for <em>P. baccae</em> to be imported. However, the potential for</td>
</tr>
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*DAFWA (2010) Department of Agriculture and Food, Western Australia submission to the draft import risk analysis report for table grapes form the People’s Republic of China. 53pp*
<table>
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<th>5</th>
<th>Infected pedicels develop light brown spots around the junction with the fruit (Zhang 2005b; NYZSW 2009). Pedicels dry and shrink when the brown spots encircle them and infections then spread to the fruit and peduncles.</th>
<th><strong>P. viticola</strong> can infect grape berries directly, rachis infection can also occur (Erincik et al. 2002).</th>
<th>It appears from this point that berry infection by <em>P. baccae</em> follows infection of the pedicels. <em>P. viticola</em> can directly infect berries. This point does not justify the difference in likelihoods assigned to <em>P. viticola</em> and this pathogen.</th>
</tr>
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<tr>
<td>6</td>
<td>After infection, peduncles develop brown spots that slowly turn black and enlarge and then the peduncles dry out (Zhang 2005b; NYZSW 2009).</td>
<td>Rachis symptoms are chlorotic spots with dark centres that enlarge to form dark brown streaks and blotches that turn black.</td>
<td>Both pathogens may display symptoms on table grape bunches of disease. However, <em>P. viticola</em> may be asymptomatic. This point does not justify the difference in likelihoods assigned to <em>P. viticola</em> and <em>P. baccae</em>.</td>
</tr>
<tr>
<td>7</td>
<td>Infected berries develop irregular brown spots that spread to cover the whole fruit (Zhang 2005b; NYZSW 2009). Infected berries then turn purple or black and dry out. Small black spots (pycnidia) develop on their surface. The infected mummified berries remain in the grape cluster on the vine and do not drop off.</td>
<td>Infected berries rot, turn brown and shrivel. Pycnidia are produced over the surface of rotting fruit.</td>
<td>This point does not justify the difference in likelihoods assigned to <em>P. viticola</em> and this pathogen.</td>
</tr>
<tr>
<td>8</td>
<td>The reported information suggests pycnidia may</td>
<td>Conidiomata may release alpha-conidia</td>
<td>Equivalent – therefore not a</td>
</tr>
</tbody>
</table>

DAFWA (2010) Department of Agriculture and Food, Western Australia submission to the draft import risk analysis report for table grapes form the People’s Republic of China. 53pp
<p>| | | |</p>
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<td>9</td>
<td>During commercial harvesting procedures, pickers select and harvest bunches of normal fruit, discarding inferior, diseased, small and damaged bunches. Inferior berries are likely to be trimmed from bunches during harvest (AQSIQ 2008).</td>
<td>This applies to <em>Phomopsis viticola</em>.</td>
</tr>
<tr>
<td>10</td>
<td>In the packing house during routine commercial post-harvest procedures, e.g. sorting, grading, packing and quality inspection and control, inferior or defective grape berries are likely to be removed from bunches before packing (AQSIQ 2008). This will not remove fruit with symptomless infection and is unlikely to remove all mummified fruit</td>
<td>This applies to <em>Phomopsis viticola</em>.</td>
</tr>
<tr>
<td>11</td>
<td>Pycnidia, perithecia and mycelia of the pathogen survive through winter in dead plant matter (Zhang 2005b; NYZSW 2009). Fruiting structures, spores and mycelia of the pathogen are likely to survive cold storage and transport.</td>
<td>Biosecurity Australia state ‘<em>Phomopsis viticola</em> will survive transport in cold storage. The pathogen occurs in regions with cold winters and overwinters as mycelium and conidiomata in canes, spurs, dormant buds, bark and mummified fruit’</td>
</tr>
<tr>
<td>Closing statement</td>
<td>The wide distribution of this pathogen in China, the potential for infected grape clusters to be symptomless and the likelihood that the pathogen will survive storage and transport, all support a risk rating for importation of 'high'.</td>
<td>Infected rachises and berries remain without symptoms until they mature and the ability and susceptibility of the berries for infection throughout the growing season all support a risk rating for importation of 'moderate'</td>
</tr>
</tbody>
</table>
Comparing the situation of *P. viticola* to the justifications for assigning the qualitative likelihood value of ‘High’ to the probability of importation for *P. baccae*; indicates that the same justifications apply to *P. viticola* yet *P. viticola* was assigned a ‘Moderate’ probability of importation. On the basis of this comparison there appears to be no justification for the differences. In fact the comparison could be interpreted as demonstrating that *P. viticola* has a higher probability of importation than *P. baccae*.

REFERENCES


**APPENDIX 2**

*Phomopsis viticola* probability of distribution - additional factors identified by DAFWA as requiring consideration. Extract from the submission to the revised draft IRA for the importation of table grapes from Chile (DAWA 2005)

- Infected fruit rapidly deteriorates in quality and is likely to be discarded in urban compost bins or larger domestic waste disposal areas. Agree; however, not all fruit is discarded in this location, providing higher likelihoods of distribution. Consideration of this likelihood has not taken into account the location of the Swan Valley viticultural area, its proximity to urban populations, the presence of several major roads, the volume of tourists that visit the area and the proximity of vines to roadsides and areas frequented by tourists and visitors.

Additionally there is no consideration of the rachis which is unlikely to breakdown rapidly and is commonly discarded outside of normal waste disposal areas. 1000% of all imported rachises will be disposed as waste and pose a significantly different likelihood of distribution than that of berries. *P. viticola* present on discarded rachis can remain dormant until conditions become suitable. It is not uncommon to find rachises that have not broken down over winter in vineyards in the spring of the following season. Grape growers have advised that it is not uncommon to see rachises that are 2 seasons old. Given that infected canes and spurs can continue to produce conidiomata and conidia for at least three seasons, and dead canes may produce pycnidia for at least three years (CABI 2004; Moller & Kasimatis 1981) and pycnidia have been reported to overwinter on infected rachises as well as dormant canes (Ellis & Erincik 2002; Pscheidt & Pearson 1991), infected rachis have the capacity to produce pycnidia until they breakdown.

Given that Pscheidt and Pearson (1991) report that the fungus overwinters on the vine in infected canes and rachises, and spores from pycnidia are produced in the spring to renew the disease cycle, this substantially increases the opportunity for the pest to be distributed to a suitable host at the most susceptible time.

As *P. viticola* is capable of long term saprobic survival of up to 4.5 years (Moller & Kasimatis 1981) and can over winter on infected rachises (Ellis & Erincik 2002; Pscheidt & Pearson 1991) it follows that the fungus could survive and continue to grow, providing a source of inoculum for as long as the rachis remains intact. If the rachis, particularly those that are thick, are able to survive for more than a year then there will be an increase in the amount of potentially infective material and the period over which an assessment is made should take this into account.

Furthermore, *P. viticola* is an active facultative wound pathogen. It can grow saprophytically on many artificial media and, in nature, is able to penetrate both dead and dying outer layers of the bark during the dormant season, often invading both wounded and unwounded tissues of grapevines (Cree 1996). This would provide year round opportunity for infection.

Conidia are washed, blown in water droplets, splashed or spread by insects onto young vine foliage or flower-bunches Emmett *et al.* (1992) as cited in CABI (2004).

- *Fruit not displaying symptoms, if imported, may be distributed.* Agreed. However, rachis with and without symptoms may also be distributed.


DAWA (2005). *Department of Agriculture, Western Australia submission to the Revised Draft Import Risk Analysis for the Importation of table grapes from Chile*. Department of Agriculture, Government of Western Australia, pp. 112.


APPENDIX 3

*Phomopsis viticola* probability of distribution compared with pathogens from (then) recent IRAs as included in the submission to the revised draft IRA for the importation of table grapes from Chile (DAWA 2005)

Furthermore, comparisons with pathogens in other IRAs identify additional inconsistencies. Examples can be found in the IRAs for longan and lychee fruit from China and Thailand (BA 2004a), Tahitian limes from New Caledonia (BA 2005) and persimmons from Japan, Korea and Israel (BA 2004b).

The likelihood that *Peronophythora litchii* will be distributed to the endangered area as a result of the processing, sale or disposal of lychee fruit from China or Thailand was assessed as ‘high’ on the following basis (BA 2004a):

- The pathogen is likely to survive storage and transportation, even at cool dry temperatures, and is unlikely to progress to visible decay before distribution;
- Fruit infected are likely to be distributed throughout Australia for retail sale and the pathogen likely to be associated with infested waste.

The likelihood that *Phomopsis longanae* will be distributed to the endangered area as a result of the processing, sale or disposal of longan or lychee fruit from China was assessed as ‘moderate’ on the following basis (BA 2004a).

- Post harvest refrigeration is essential for post-harvest disease suppression and disease can develop if fruit is held at ambient temperature. However, as the pathogen is not killed by refrigeration, it could sporulate when infected fruit is brought out from cool storage into ambient temperature;
- Fruit infected are likely to be distributed throughout Australia for retail sale and the pathogen likely to be associated with infested waste.

The likelihood that *Phytophthora palmivora* will be distributed to the endangered area as a result of the processing, sale or disposal of longan or lychee fruit from Thailand was assessed as ‘moderate’ on the following basis (BA 2004a).

- Although a tropical pathogen, *P. palmivora* is likely to survive storage and transportation even at dry cool temperatures, as chlamydospores in the fruit are the most important survival structure;
- Fruit infected are likely to be distributed throughout Australia for retail sale and the pathogen likely to be associated with infested waste.

The likelihood that *Phoma kakivora* (black spot) will be distributed to the endangered area as a result of the processing, sale or disposal of fresh persimmon fruit was assessed as ‘moderate’ on the following basis (BA 2004b):

- Pycnidia and spores of *P. kakivora* are likely to survive transportation and storage;
- The commodity may be distributed throughout Australia for retail sale. The intended use of the commodity is human consumption but waste material would be generated. *P. kakivora* may enter the environment in two ways: pycnidia and pycnidiospores may be associated with discarded persimmon skin or they may be spread by water from persimmons at the point of sale or after purchase by consumers.

The likelihood that citrus scab will be distributed to the endangered area as a result of the processing, sale or disposal of fresh Tahitian lime fruit from New Caledonia was assessed as ‘moderate’ on the following basis (BA 2005)
- *Sphaceloma fawcettii* is present on infected fruit as conidia in pustules on the fruit surface. It has also been known to survive on susceptible citrus as dormant mycelium;
- Transfer to a host would be possible via the movement of conidia from infected fruit. This could be either by splash dispersal or direct contact;
- The commodity may be distributed throughout Australia for retail sale. The intended use of the commodity is human consumption but waste material would also be generated.

Despite the likelihoods determined above it is suggested that Western Australia accept that the likelihood that *Phomopsis viticola* will be distributed as a result of the processing, sale or disposal of table grapes from Chile as **Low**, based on;

- Infected fruit rapidly deteriorates in quality and is likely to be discarded in urban compost bins or larger domestic waste disposal areas;
- Fruit not displaying symptoms, if imported, may be distributed.

This justification for a low likelihood is inadequate, and provides no substantial justification for such a low probability, especially when compared to previous quarantine pests. The information presented in the revised draft IRA is an incomplete picture of the pathogen. It is unclear why the revised draft IRA selectively uses the available information, has largely discounted the referenced information presented by the Department and centred the arguments on berry infections rather than the rachis, which is the most significant pathway. The matter of the revised draft IRA disregarding rachis infection without any justification is unacceptable and brings into question the scientific rigour and objectivity of the analysis.


DAWA (2005). *Department of Agriculture, Western Australia submission to the Revised Draft Import Risk Analysis for the Importation of table grapes from Chile*. Department of Agriculture, Government of Western Australia, pp. 112.
Phomopsis viticola probability of distribution as recommended by DAFWA in the submission to the revised draft IRA for the importation of table grapes from Chile (DAWA 2005)

The probability assigned in the revised draft IRA is not accepted and a rating of at least **Moderate**, consistent with that of other pests with similar justification is proposed, based on the following:

- Infected fruit rapidly deteriorates in quality and is likely to be discarded in urban compost bins or larger domestic waste disposal areas;

- Fruit not displaying symptoms, if imported, may be distributed;

- Will survive shipment because of its ability to tolerate cold storage temperatures;

- Latent infections can occur within bunches and lesions can occur within fruit and/or within bunches and remain with the commodity during distribution via wholesale or retail trade;

- Not all lesions on infected rachis and rots will be removed and may therefore remain with the commodity during distribution via wholesale or retail sale;

- The commodity may be distributed throughout Australia for retail sale. The intended use of the commodity is human consumption but waste material would be generated (for example, vegetative parts of the cluster and discarded berries);

- *P. viticola* present on grapevine material can remain dormant until conditions become suitable. Infected material can continue to produce conidiomata and conidia for at least three seasons (CABI 2004; Moller & Kasimatis 1981);

- Infected leaves may not develop symptoms until they become senescent. Some infections of the shoot may never develop symptoms but will produce pycnidia during the dormant season (Pscheidt & Pearson 1991). There is no reason to suggest that infected rachises may not develop symptoms but will produce pycnidia following harvest or after having been discarded in Australia;

- The fungus overwinters on the vine in infected canes and rachises, and spores from pycnidia are produced in the spring to renew the disease cycle (Pscheidt & Pearson 1991), this substantially increases the opportunity for the pest to be distributed to a suitable host at the most susceptible time. It also suggests that infected material would survive long enough so that seasonal timing of imports would not have a great effect on the capacity of the pathogen to find a suitable site on a suitable host;

- *P. viticola* present on discarded rachis and berries can remain dormant until conditions become suitable. *P. viticola* is capable of long term saprobic survival of up to 4.5 years (Moller & Kasimatis 1981). Given that infected canes and spurs can continue to produce conidiomata and conidia for at least three seasons, and dead canes may produce pycnidia for at least three years (CABI 2004; Moller & Kasimatis 1981) and pycnidia have been reported to overwinter on infected rachises as well as dormant canes (Ellis & Erincik 2002; Pscheidt & Pearson 1991), infected rachis will produce pycnidia until they breakdown, significantly increasing the opportunity for spores to be transferred to a suitable site on a suitable host;

- Intact rachises have been observed in a vineyard after 2 seasons;
α-Conidia are washed, blown in water droplets, splashed or spread by insects onto young vine foliage or flower-bunches (Emmett et al. (1992) as cited in CABI (2004) and Punithalingam (1979));

Shoot tips may become infected at any time during the year but infection is more common between bud break and bloom (Pscheidt & Pearson 1991);

Although table grape imports are expected during the summer and autumn month’s, mycelium and pycnidia in infected material discarded may remain inactive until suitable environmental conditions are met when the liberation of conidia will occur. It is known that pycnidia can produce conidia for up to three seasons thus allowing sufficient opportunity for the disease to be distributed on to a susceptible host plant. *P. viticola* is known to survive and complete its lifecycle in many regions with a comparable climate to grape producing regions in Western Australia, such as the Barossa Valley and Mount Pleasant in South Australia as well as Ballarat and Nagambie in Victoria (CABI 2004; Merrin *et al.* 1995).

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DAWA (2005). *Department of Agriculture, Western Australia submission to the Revised Draft Import Risk Analysis for the Importation of table grapes from Chile*. Department of Agriculture, Government of Western Australia, pp. 112.


**APPENDIX 5**


PERTH 07854145

*Vitis vinifera L.*
Vitaceae


Origin: PERTH Duplicates to: MEL

PERTH 07816057

*Vitis vinifera L.*
Vitaceae

Plant Description: Vine that has seedlings. Vegetation: Closed scrub with Agonis juniprina and Taraxis grasses. Site Description: River with red - brown loam over ironstone. Frequency: scattered along the river. Other Notes: Gibb Q1. Locality: Carbanup River; Lot 5; Gibbs Road; Shire of Busselton State: WA Lat: 33° 46' 6.3" S Long: 115° 10' 41.8" E (GDA94) Collector: G.J. Keighery, B.J. Keighery & R. Ryan 837 Collection Date: 19 October 2006

DAFWA (2010) Department of Agriculture and Food, Western Australia submission to the draft import risk analysis report for table grapes form the People’s Republic of China. 53pp
**Vitis vinifera** L.
Vitaceae

Plant Description: Vine to 12 m, climbing over vegetation and up trees. Not in flower.
Vegetation: Eucalyptus diversicolor tall forest over weeds (Bracken, Kikuyu and Dolichos).
Site Description: Black sandy clay over clay.
Locality: Karri Forest Walk, Denmark, State: WA
Lat: 34° 17' 38.0" S Long: 115° 23' 56.0" E (GDA94)
Collector: G.J. Keighery 15613
Collection Date: 13 December 1998

**Vitis vinifera** L.
Vitaceae

Plant Description: Vine, climbing high into trees and shrubs.
Vegetation: With Watsonia sp., Schinus terebinthifolia and Melaleuca rhaphiophylla under Eucalyptus calophylla and E. rudis.
Site Description: Grey-brown alluvium on creek.
Frequency: few plants.
Locality: Near Susannah Brook, ca 4 km S of Swan River crossing on Great Northern Highway, Herne Hill State: WA
Lat: 31° 50' S Long: 116° 1' E (GDA94)
Collector: B.J. Lepschi & T.R. Lally 2229
Collection Date: 29 October 1995

Determinavit: B.J. Lepschi Date: 1995
*Vitis vinifera L.
Vitaceae

Plant Description: Vine climbing high into trees.
Vegetation: With Hakea sp., Melaleuca incana and other shrubs under Eucalyptus marginata.
Site Description: Grey-brown sandy clay-silt in creekline.
Other Notes: Abundance: single (?) plant.
Locality: Ca 1 km E of Lake Leschenaultia turnoff on Great Eastern Highway, ca 2 km S of Chidlow State: WA
Lat: 31° 54' S Long: 116° 16' E (GDA94)
Collector: B.J. Lepschi & T.R. Lally 2252
Collection Date: 29 October 1995

Determinavit: B.J. Lepschi Date: 1995
Origin: PERTH
Duplicates to: AD CANB

PERTH 4121953

*Vitis vinifera L.
Vitaceae

Vegetation: With some Avena barbata and Ehrharta longiflora.
Site Description: Accumulated soil amongst rocks on bridge support pillar.
Other Notes: Abundance: single old plant.
Locality: Ca 17 km W of Northam on road to Perth State: WA
Lat: 31° 34' S Long: 116° 1' E (GDA94)
Collector: B.J. Lepschi & T.R. Lally 2251
Collection Date: 29 October 1995

Determinavit: B.J. Lepschi Date: 1995
*Vitis vinifera L.
Vitaceae

Plant Description: Climbing vine extending high into trees.
Vegetation: Eucalyptus rudis, Acacia sp. over Pennisetum clandestinum and Watsonia sp.
Site Description: Grey-brown alluvium on river bank.
Other Notes: Abundance: common in small area.
Locality: Swan River at junction of Great Northern Highway and West Swan Road, Upper Swan, N of Perth State: WA
Lat: 31° 46' 55.6" S Long: 116° 1' 5.3" E (GDA94)
Collector: B.J. Lepschi & T.R. Lally 1978
Collection Date: 24 September 1995

Origin: PERTH
Duplicates to: AD CANB K MEL NSW

PERTH 04362217

*Vitis vinifera L.
Vitaceae

Plant Description: Tangled shrub 2 m x 150 m.
Vegetation: Typha orientalis.
Site Description: Edges of lake, sand over clay.
Frequency: common on western shore.
Locality: Yonderup Lake, S end, Yanchep, 50 km N of Perth State: WA
Lat: 31° 33' 35.0" S Long: 115° 41' 0.0" E (GDA94)
Collector: G.J. Keighery & J.J. Alford 1716
Collection Date: 19 April 1988
APPENDIX 6

Comments on the Draft Chinese Grapes IRA.

An initial database search for known weed species that are present in China and not present in Australia resulted in a list of 1567 species (Randall, 2010). Further refinements of the search delimiters (removing synonymous names, species not found in the grape growing zones and species unlikely to contaminate grape crops and minor weeds i.e. less than five references) reduced this list down to 52 species (Table 1., Randall, 2010). All 52 are present to some extent in the grape growing regions of China according to the Flora of China (FOC, 2008) and all have five or more references as a weed (Randall, 2010), with the majority, 40 species, having references that indicate they are weeds of agriculture (Randall, 2010).

Another search was also conducted to determine those species of weeds present in China that are present in Australia and are either Declared Plants or Quarantine weeds in Western Australia. This search yielded a large list of 217 species (Randall, 2010), but after considering only those species that could most likely contaminate a grape crop the list was reduced to 128 species (Table 3., Randall, 2010).

Table 1. Fifty two weed species, that could potentially contaminate grape bunches from China that are not present in Australia (none yet assessed for entry into Western Australia).

<table>
<thead>
<tr>
<th>Species</th>
<th>Author</th>
<th>Known Agric Weed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achillea alpina</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Alopecurus japonicus</td>
<td>Steud.</td>
<td>Y</td>
</tr>
<tr>
<td>Androsace filiformis</td>
<td>Retz.</td>
<td>Y</td>
</tr>
<tr>
<td>Androsace maxima</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Arabis pendula</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Artemisia austriaca</td>
<td>Jacq.</td>
<td></td>
</tr>
<tr>
<td>Artemisia tournefortiana</td>
<td>Reichenb.</td>
<td>Y</td>
</tr>
<tr>
<td>Atriplex micrantha</td>
<td>Ledeb.</td>
<td></td>
</tr>
<tr>
<td>Bidens cernua</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Bidens frondosa</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Bidens parviflora</td>
<td>Willd.</td>
<td>Y</td>
</tr>
<tr>
<td>Calystegia pellita</td>
<td>(Ledeb.) G.Don</td>
<td>Y</td>
</tr>
<tr>
<td>Camelina microcarpa</td>
<td>Andrz. ex DC.</td>
<td>Y</td>
</tr>
<tr>
<td>Chenopodium urbicum</td>
<td>L.</td>
<td>Y</td>
</tr>
</tbody>
</table>

DAFWA (2010) Department of Agriculture and Food, Western Australia submission to the draft import risk analysis report for table grapes form the People’s Republic of China. 53pp
<table>
<thead>
<tr>
<th>Species</th>
<th>Author</th>
<th>Import Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cirsium helenioides</td>
<td>(L.) Hill</td>
<td></td>
</tr>
<tr>
<td>Corispermum declinatum</td>
<td>Steph. ex Iljin</td>
<td>Y</td>
</tr>
<tr>
<td>Cuscuta lupuliformis</td>
<td>Krock.</td>
<td></td>
</tr>
<tr>
<td>Cuscuta monogyna</td>
<td>Vahl</td>
<td>Y</td>
</tr>
<tr>
<td>Cyperus nipponicus</td>
<td>Fr. &amp; Sav.</td>
<td>Y</td>
</tr>
<tr>
<td>Dodartia orientalis</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Draba sibirica</td>
<td>(Pall.) Thell.</td>
<td></td>
</tr>
<tr>
<td>Eriocaulon robustius</td>
<td>(Maxim.) Makino</td>
<td>Y</td>
</tr>
<tr>
<td>Erodium stephanianum</td>
<td>Willd.</td>
<td>Y</td>
</tr>
<tr>
<td>Fumaria schleicheri</td>
<td>Soyer-Willem.</td>
<td>Y</td>
</tr>
<tr>
<td>Gratiola japonica</td>
<td>Miq.</td>
<td>Y</td>
</tr>
<tr>
<td>Inula britannica</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Ipomoea lacunosa</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Juncus alatus</td>
<td>Franch. &amp; Sav.</td>
<td>Y</td>
</tr>
<tr>
<td>Leersia japonica</td>
<td>Honda ex Honda</td>
<td>Y</td>
</tr>
<tr>
<td>Lepidium appelianum</td>
<td>Al-Shehbaz</td>
<td></td>
</tr>
<tr>
<td>Lysimachia thyrsiflora</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Monochoria korsakowii</td>
<td>Regel &amp; Maack</td>
<td>Y</td>
</tr>
<tr>
<td>Polycnemum arvense</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Potamogeton gramineus</td>
<td>L.</td>
<td>Y</td>
</tr>
<tr>
<td>Potentilla longifolia</td>
<td>Willd. ex Schltdl.</td>
<td></td>
</tr>
<tr>
<td>Rumex pseudonatronatus</td>
<td>(Borbás) Borbás ex Murb.</td>
<td>Y</td>
</tr>
<tr>
<td>Rumex stenophyllus</td>
<td>Ledebr.</td>
<td>Y</td>
</tr>
<tr>
<td>Saussurea amara</td>
<td>(L.) DC.</td>
<td>Y</td>
</tr>
<tr>
<td>Schoenoplectus triqueter</td>
<td>(L.) Pall.</td>
<td></td>
</tr>
<tr>
<td>Scirpus planiculmis</td>
<td>Fr. Schmidt</td>
<td>Y</td>
</tr>
<tr>
<td>Senecio cannabifolius</td>
<td>Less.</td>
<td></td>
</tr>
<tr>
<td>Siegesbeckia pubescens</td>
<td>(Makino) Makino</td>
<td>Y</td>
</tr>
<tr>
<td>Sisymbrium polymorphum</td>
<td>(Murray) Roth</td>
<td></td>
</tr>
<tr>
<td>Sonchus brachyotus</td>
<td>DC.</td>
<td>Y</td>
</tr>
</tbody>
</table>
Table 2. Specific comments on distribution and habitat of a number selected weed species according to the Flora of China (FOC, 2008).

Rocky slopes, roadsides, woodlands, meadows, limestone cliffs, hillsides, waste places, thickets, forest margins, valleys, river banks, grassy areas, deserts; near sea level to 4300 m.
Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan

On trees, shrubs, perennial herbs.
Xinjiang

Cuscuta lupuliformis Krocker, Fl. Siles. 1: 261, t. 36. 1787.
On trees, shrubs, perennial herbs.
Gansu, Hebei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Xinjiang

Meadows, steppes, flood plains, farmlands; 400-4000 m.
Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang

Water sides, field margins, moist valleys; 200-1200 m.
Heilongjiang, Jilin, Nei Mongol, Xinjiang
Table 3. 128 weed species, that are present in Australia that could potentially contaminate grape bunches from China and are either Declared Plants or Quarantine Weeds in Western Australia.

<table>
<thead>
<tr>
<th>Species</th>
<th>author</th>
<th>WA Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternanthera philoxeroides</td>
<td>(Mart.) Griseb.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Amaranthus blitoides</td>
<td>S.Watson</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Amaranthus spinosus</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Amorpha fruticosa</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Anaphalis margaritacea</td>
<td>(L.) Benth. &amp; Hook. f.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Anthemis arvensis</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Asparagus asparagoides</td>
<td>(L.) Druce</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Bromus tectorum</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Broussonetia papyrifera</td>
<td>(L.) Vent.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Bryophyllum pinnatum</td>
<td>(Lam.) Oken</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Calla palustris</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Calotropis procera</td>
<td>(Ait.) W.T.Ait.</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Carduus nutans</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Carthamus lanatus</td>
<td>L.</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Centaurea scabiosa</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Chenopodium hybridum</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Chondrilla juncea</td>
<td>L.</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Chromolaena odorata</td>
<td>(L.) R.M.King &amp; H.Rob.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Cirsium arvense</td>
<td>(L.) Scop.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Clematis tangutica</td>
<td>(Maxim.) Korsh.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Cobaea scandens</td>
<td>Cav.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Commelina tuberosa</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Conoclinium coelestinum</td>
<td>(L.) DC.</td>
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</tr>
<tr>
<td>Convolvulus arvensis</td>
<td>L.</td>
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</tr>
<tr>
<td>Crotalaria incana</td>
<td>L.</td>
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</tr>
<tr>
<td>Crotalaria lanceolata</td>
<td>E.Mey.</td>
<td>Quarantine Weed</td>
</tr>
</tbody>
</table>

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Cuphea viscosissima  
Cuscuta campestris  
Cynanchum acutum  
Cynara cardunculus  
Cynoglossum officinale  
Dioscorea oppositifolia  
Echium vulgare  
Eichhornia crassipes  
Eleocharis acicularis  
Eleocharis parvula  
Ephedra sinica  
Epilobium hirsutum  
Eremochloa ophiuroides  
Eupatorium cannabinum  
Euryale ferox  
Galeopsis tetrahit  
Galium aparine  
Galium mollugo  
Geranium thunbergii  
Glyceria fluitans  
Gomphocarpus fruticosus  
Haematoxylum campechianum  
Hedychium coccineum  
Hedysarum fruticosum  
Helenium autumnale  
Hordeum bogdanii  
Hordeum brevisubulatum  
Hypericum perforatum  
Isatis tinctoria  

Quarantine Weed  
Declared Plant  

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<table>
<thead>
<tr>
<th>Plant Name</th>
<th>Authority</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juncus ensifolius</td>
<td>Wikstr.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Koeleria glauca</td>
<td>DC.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Kyllinga nemoralis</td>
<td>(J.R. &amp; G.Forst.) Dandy</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Lantana camara</td>
<td>L.</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Lathyrus pratensis</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Leonurus sibiricus</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Lepidium campestre</td>
<td>(L.) R.Br.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Lepidium draba</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Lepidium ruderale</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Lilium formosanum</td>
<td>Wallace</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Limnocharis flava</td>
<td>(L.) Buchenau</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Limonium otolepis</td>
<td>(Schrenk) Kuntze</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Linaria vulgaris</td>
<td>Mill.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Lysimachia clethroides</td>
<td>Duby</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Malva pusilla</td>
<td>Sm.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Malva sylvestris</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Malva verticillata</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Marrubium vulgare</td>
<td>L.</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Martynia annua</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Melilotus suaveolens</td>
<td>Ledebed</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Melilotus wolgicus</td>
<td>Poir.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Mikania micrantha</td>
<td>Kunth</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Mimosa diplotricha</td>
<td>C.Wright</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Mimosa pudica</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Muntingia calabura</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Neptunia plena</td>
<td>(L.) Benth.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Nymphaea nouchali</td>
<td>Burm. f.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Nymphaea tetragona</td>
<td>Georgi</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Onobrychis pulchella</td>
<td>Schrenk</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Ononis spinosa</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Authority</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orobanche ramosa</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Parthenium hysterophorus</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Phlomis umbrosa</td>
<td>Turcz.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Phyllanthus niruri</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Phyllostachys angusta</td>
<td>McClure</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Phytolacca americana</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Pinellia pedatisecta</td>
<td>Schott</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Polygonum argyrocoleon</td>
<td>Steud. ex Kunze</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Polygonum nepalense</td>
<td>Meissn.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Praxelis clematidea</td>
<td>(Griseb.) R.M.King &amp; H.Rob</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Pueraria montana</td>
<td>(Lour.) Merr.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Pyrrhosia piloselloides</td>
<td>(L.) M.G.Price</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Ranunculus repens</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Ranunculus sceleratus</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Rehmannia glutinosa</td>
<td>(Gaertn.) Steud.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Rumex acetosa</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Sanguisorba officinalis</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Saposhnikovia divaricata</td>
<td>(Turcz.) Schischk.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Scilla siberica</td>
<td>Haw. ex Andr.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Senecio jacobaea</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Sesbania exaltata</td>
<td>(Raf.) Rydb. ex A.W.Hill</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Sida acuta</td>
<td>Burm. f.</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Silene nutans</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Silene pendula</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Silybnum marianum</td>
<td>(L.) Gaertn.</td>
<td>Declared Plant</td>
</tr>
<tr>
<td>Solanum lasiocarpum</td>
<td>Dunal</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Solanum villosum</td>
<td>(L.) P.Mill.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Sonchus arvensis</td>
<td>L.</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Sophora mollis</td>
<td>(Royle) Graham ex Baker</td>
<td>Quarantine Weed</td>
</tr>
<tr>
<td>Spartina anglica</td>
<td>C.E.Hubb.</td>
<td>Quarantine Weed</td>
</tr>
</tbody>
</table>

DAFWA (2010) Department of Agriculture and Food, Western Australia submission to the draft import risk analysis report for table grapes from the People’s Republic of China. 53pp

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Spermacoce latifolia  Aubl.  Quarantine Weed
Stipa capillata  L.  Quarantine Weed
Swietenia macrophylla  King  Quarantine Weed
Tephrosia candida  DC.  Quarantine Weed
Thlaspi arvense  L.  Quarantine Weed
Typha latifolia  L.  Quarantine Weed
Verbascum blattaria  L.  Quarantine Weed
Veronica beccabunga  L.  Quarantine Weed
Veronica hederifolia  L.  Quarantine Weed
Viola arvensis  Murray  Quarantine Weed
Xanthium spinosum  L.  Declared Plant
Xanthium strumarium  L.  Declared Plant

Essentially there are a minimum of 180 weed species that pose reasonable contamination concerns in imported grape bunches from China. There are also many hundreds more Chinese plant species of an unknown potential that could possibly enter this pathway and also find their way into Australia via grape bunches. China’s flora is vast with over 60,000 recognised species (FOC, 2008) where many of the reported weeds there are native species that are found nowhere else (Appendix 1. Chinese Weed References) This huge pool of unassessed species, many already with local weed issues, pose a significant threat to Australia’s primary industries and environment which is not properly considered nor dealt with in this IRA.

While inspection of imported bunches is obvious requirement it should be acknowledged that such inspections can never be intensive enough to cover all the bunches being imported. Nor can they be comprehensive enough to find all hidden seed inside grape bunches. Seed will hid in the smallest of crevices and gaps between the berries and inside the bunches. Detailed destructive inspections are the only way to find all seed and insect contaminants, but with large consignments inspections level may need to be revised depending on the number of originating sources and actual inspection outcomes. This means carefully targeted and managed inspection techniques need to be devised to determine the risk of each and every consignment before entry could be allowed.

While both the recent New Zealand IRA (Attachment 2.) and the 1999 AQIS IRA (Attachment 3.) on grape bunch imports specifically consider weed seeds in the bunch pathway, the latest IRA from Biosecurity Australia seems to totally ignore this potential with the only mention of weed seeds in a very general manner under some basic and rather generic packaging and inspection guidelines (Attachment 1.). This recent IRA focuses more on the probability of pathogens obtaining access to Australia through casually disposed grape seed than weed seeds as hitchhikers within grape bunches. The pathway and potential weed risks needs to be reviewed.

References:
Appendix 1. Chinese Weed References used to develop both tables:


Attachment 1: Relevant sections regarding weed seed contamination from the draft IRA on table grapes from China

Packaging and labelling

The objectives of this proposed procedure are to ensure that:

- table grapes proposed for export to Australia are not contaminated by quarantine pests or regulated articles (e.g. trash, soil and weed seeds)
- unprocessed packing material (which may vector pests not identified as being on the pathway) is not imported with table grapes
- all wood material used in packaging of the commodity complies with AQIS conditions (see AQIS publication ‘Cargo Containers: Quarantine aspects and procedures’)
- secure packaging is used if consignments are not transported in sealed containers directly to Australia
- the packaged table grapes are labelled with the vineyard registration number for the purposes of trace back to registered vineyards
- the pre-cleared status of table grapes is clearly identified.

Specific conditions for storage and movement

The objectives of this proposed procedure are to ensure that:

- product for export to Australia that has been treated and/or inspected are kept secure and segregated at all times from any fruit for domestic or other markets, untreated/non pre-cleared product, to prevent product mixing or cross-contamination
- the quarantine integrity of the commodity during storage and transport is maintained.

Freedom from trash

All table grapes for export must be free from pests of quarantine concern to Australia or regulated articles. Regulated articles are defined as any items other than the grape bunch. This may include leaf material, woody plant material, weeds, weed seeds, or any other contaminant, often referred to as ‘trash’. Freedom from trash will be confirmed by the inspection procedures. AQSIQ/CIQ must provide details of how inspection for trash will occur before trade commences.

Pre-export phytosanitary inspection and certification

The objectives of this proposed procedure are to ensure that:

- all consignments are inspected by CIQ in accordance with official procedures for all visually detectable quarantine pests and other regulated articles (including soil, animal and plant debris) at a standard 600 unit sampling rate per lot whereby one unit is one bunch of table grapes
- an international phytosanitary certificate (IPC) is issued for each consignment upon completion of pre-export inspection and treatment to verify that the relevant measures have been undertaken offshore
  - each IPC includes:
    - a description of the consignment (including vineyard number and packing house details)
  and
  - an additional declaration that ‘The fruit in this consignment has been produced in
the People’s Republic of China in accordance with the conditions governing entry of table grapes to Australia and inspected and found free of quarantine pests”.

Requirement for pre-clearance

The objectives of the proposed requirement for pre-clearance are to ensure that:

- the proposed quarantine measures, including vineyard control and surveillance, product identification, AQIS inspection requirements, product security and documentation are met

- all lots are inspected by AQIS and CIQ in accordance with official procedures for all visually detectable quarantine pests and other regulated articles (including soil, animal and plant debris) at a standard 600 unit sampling rate per lot whereby one unit is one bunch of table grapes

- the detection of live quarantine pests will result in the rejection of the inspection lot and remedial action may be required.

Under pre-clearance arrangements, AQIS officers would be involved in vineyard inspections for pests of quarantine concern to Australia, in the direct verification of packing house procedures, treatments and in joint fruit inspection. It would further include their involvement in auditing of other arrangements including registration procedures, existing commercial practice, traceability, and handling of export fruit in a secure manner.

The pre-clearance arrangement is to be used at least for initial trade. Subsequently, subject to a review of the trade and agreement by DAFF and AQSIQ on a region by region basis, pre-clearance of lots in China might not be undertaken in the future and in this case AQIS will conduct the quarantine inspection on arrival in Australia.
12.3 Weed seeds

Seeds are routinely intercepted on table grapes imported into New Zealand from other countries (see Section 3.2), despite the requirement that imported grapes are free of regulated weed seeds. Because of the large number of plant species present in China it is not possible to assess the risk of every weed species that could potentially be present on the table grape bunches. The possible presence of seeds on grape bunches depends on many variables, for instance the location and surroundings of the vineyard or packing station, weed management in and around the vineyard and packing station or even the wind direction around the time of harvest.

Experience with intercepted weed seeds on current imported table grape pathways indicates that table grapes are often contaminated with seeds from other plant species. The seeds can easily get stuck in the complex structure of grape bunches. Since there is rarely published literature on the specific association, interception records are particularly valuable in demonstrating the association. Whilst seeds are often mentioned as important contaminants, they are generally not identified to species level. Most seeds intercepted on table grapes are in the families Zygophyllaceae, Poaceae and Asteraceae (MAFBNZ, 2009). Many of these plants produce large numbers of small, wind blown seeds which would be expected to contaminate bunches of grapes in the vineyard. A few interceptions are of species with larger, spiny seeds such as Tribulus terrestris. These are more likely to be indicative of contamination during the harvest and packing processes. New weed species have the potential to cause production losses and threaten New Zealand’s natural heritage if they become established. The possible impact of new weeds in New Zealand is not always easily predicted and can vary considerably from that in their native range (Randall, 1999).

In addition to the direct effects of new weed species establishing here, seeds (including those of species that are already present in New Zealand) may be vectors for plant pests and diseases. Many viruses are shown to be seed transmittable. Moreover, a large number of bacterial and fungal diseases may also be seed transmitted. Nematodes and even arthropods can be carried in the seed (Barrett, 1991; Maas, 1987). Due to the large number of pests and diseases associated with seeds, the importation of seed for sowing for many species is subject to stringent entry conditions (MAF Biosecurity Authority, 2004). Seeds can be dormant for variable periods of time, depending on the species. For instance, seeds in the grass family Poaceae have recorded longevities from one to fifteen years (Shem Tov and Fennimore, 2003). Moreover, there are reports of seeds germinating following exposure of soil buried for several hundred years (Odum, 1974). Other species survive for shorter periods of time. Therefore, the short time needed for transport from China to New Zealand is not likely to be a mitigating factor.

Given that:

- seeds are routinely intercepted on imported table grapes;
- many seeds will be able to survive transport to New Zealand in association with table grapes;
• at least some seeds are of species not present in New Zealand, and any seed could vector diseases;

Seed contaminants are considered potential hazards.

It is not possible to undertake a detailed risk assessment without knowing which species are involved. The analysis of interception records would give an indication to which weed seeds are likely to be associated with the pathway and escape the mitigations measures. Interception data are intended to be used as a review tool, not as a primary risk mitigation measure or a tool to prove efficacy of a suggested measure. During the packing process, grapes are airbrushed, which will have a mitigating effect. The shipment has to be free of weed seeds (as stated in MAFA BNZ biosecurity New Zealand standard 152.02: importation and clearance of fresh fruit and vegetables into New Zealand). An official phytosanitary inspection will have to be performed to assure that the commodity is free of any weed seeds. Lots contaminated with regulated weed seeds at levels exceeding the acceptance level stated in the appropriate sampling plan should be held. Contaminated lots should be treated, reshipped or destroyed at the importer's expense.

3.2 Review of organism interception records

Records from the MAF Interception Database (MAFBNZ, 2009) of organisms intercepted at the New Zealand border on imported table grapes, are summarised in Appendix 1. **Weed seeds are regularly intercepted on imported grapes. They are not included in Appendix 1 because they are not identified to species level and are outside the scope of this risk analysis.**

New Zealand imports table grapes from Australia, Chile, Mexico and USA (California). Samples of imported table grapes are taken for inspection when they arrive in New Zealand. Any organisms found are identified in MAF laboratories and then recorded in the MAF database. The list is likely to contain only a small proportion of the organisms that have been associated with this trade, and organisms of larger size and contrast and with diagnostic keys readily available will be over-represented (MAFBNZ, 2008). The list has been provided to indicate the types of organisms that are known to be associated with table grapes in international trade. Since not every organism on a pathway is detected, not every organism is recorded or identified, and search efforts and levels of identification can vary, these data cannot be extrapolated to predict likely pest interception numbers for table grapes from China. In this analysis they have been used only for hazard identification and analysis of likelihood of entry. Viability data, where available, was used in assessing the efficacy of treatments. The risk analysis uses available information to assess risk from organisms associated with table grapes. Significant uncertainties and associated assumptions are identified in the risk assessment for each potential hazard. Review of interception records collected once trade has commenced is a good way to test these assumptions as well as the efficacy of risk management measures. Interception data is intended to be used as a review tool not as a primary risk mitigation measure.

Interception records are a good means of determining which hitchhiker organisms are likely to be associated with a commodity. Hitchhikers have an opportunistic association with a commodity or item with which they have no biological host relationship, but can be important hazards for other hosts. Literature reviews and country of origin pest lists will not usually identify such organisms as potential hitchhikers on the commodity. Hitchhikers are common on table grapes, for instance spiders (Araneae) are regularly detected. Several spiders have been identified as hazards on table grapes (MAFBNZ, 2002). Therefore spiders are also likely to be potential hazards on table grapes from China. Other possible hitchhiker
organisms on table grapes coming into New Zealand from other countries have been identified and are assessed in Chapter 12. Once trade in table grapes from China starts, the assumptions in this chapter can be verified from the subsequent interception records and risk mitigation measures reviewed if necessary.

[From pages 22 and 242 of the New Zealand IRA]
6. OTHER ASSESSMENTS

6.1 Weed Risk Assessment of Table Grapes

The importation of fruit is also a pathway for the introduction of grape seed. Although species of *Vitis* such as *V. aestivalis*, *V. candicans*, *V. hastata*, *V. rotundifolia*; *V. trifolia* and *V. vulpina* are recorded as weeds in parts of the world such as China, India, Japan and USA, there are no records of *Vitis vinifera* as a weed. *Vitis vinifera* has been assessed using the Weed Risk Assessment System of AQIS to determine its potential weediness and has been determined as being of no quarantine concern.

6.2 Weed Seed Contamination of Table Grape Imports

There is a potential for table grapes for export to contain exotic weed seeds of quarantine concern to Australia. This is due to the grape clusters being contaminated by the seeds of plants growing in the rows. Such weed seeds include *Abutilon theophrasti* (velvet leaf), *Acroptilon repens* (creeping knapweed), *Amsinckia* spp. (Amsinckia), *Baccharis halimifolia* (*Baccharis*), *Cenchrus* spp. (grass), *Chamomilla suaveolens* (pineapple weed), *Chondrilla juncea* (skeleton weed), *Convolvulus arvensis* (field bindweed), *Eragrostis curvula* (African love grass), *Lycium* spp. (boxthorn), *Pennisetum alopecuroides* (Chinese pennisetum), *Pennisetum polystachion* (mission grass), *Phragmites* spp., *Solanum elaeagnifolium* (silverleaf nightshade), *Solanum sarrachoides* (hairy nightshade), *Sorghum almum* (Columbus grass), *Sorghum halepense* (Johnson grass), *Toxicodendron diversilobum* (Pacific poison-oak), *Tribulus* spp. (caltrop) and *Xanthium* spp. (bur).

Table grapes for export to Australia would therefore need to be inspected and found to be free of the above mentioned weed species. Any grapes found to be contaminated with any of these weed seeds would be treated on-arrival in Australia and if no treatment is available then the affected table grapes would be reshipped or destroyed at the expense of the importer.

[From page 46 of the draft IRA]