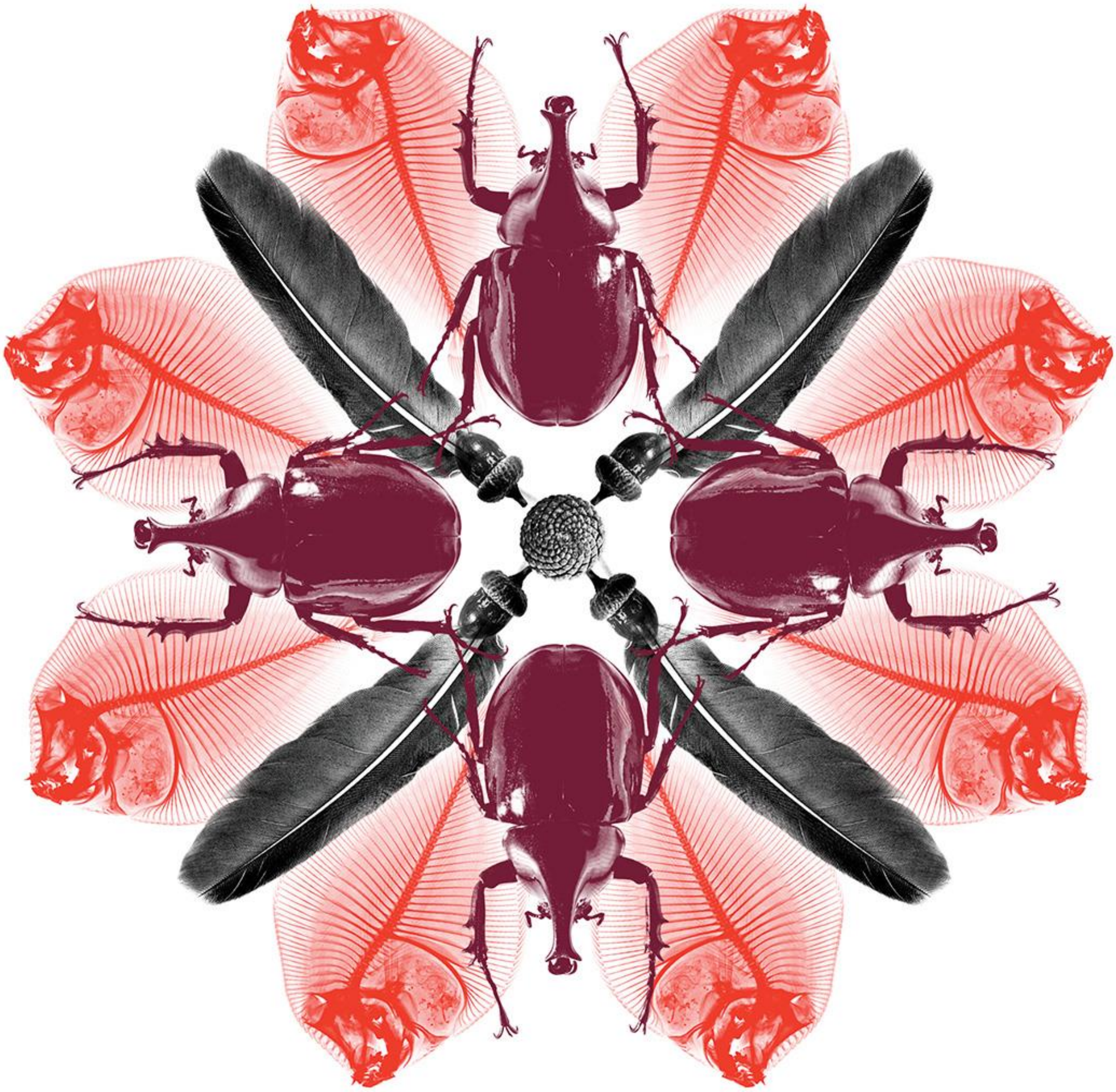
Australian Government
Department of Agriculture and Water Resources

Final report for the non-regulated analysis of existing policy for table grapes from Sonora, Mexico

November 2016



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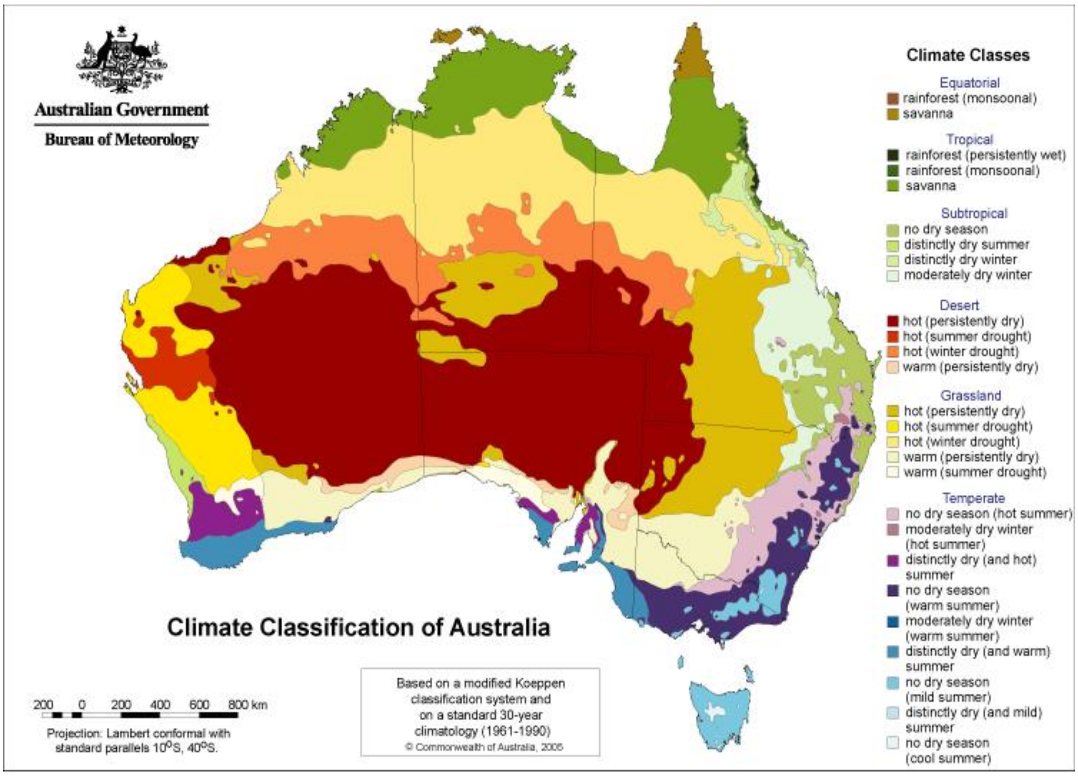
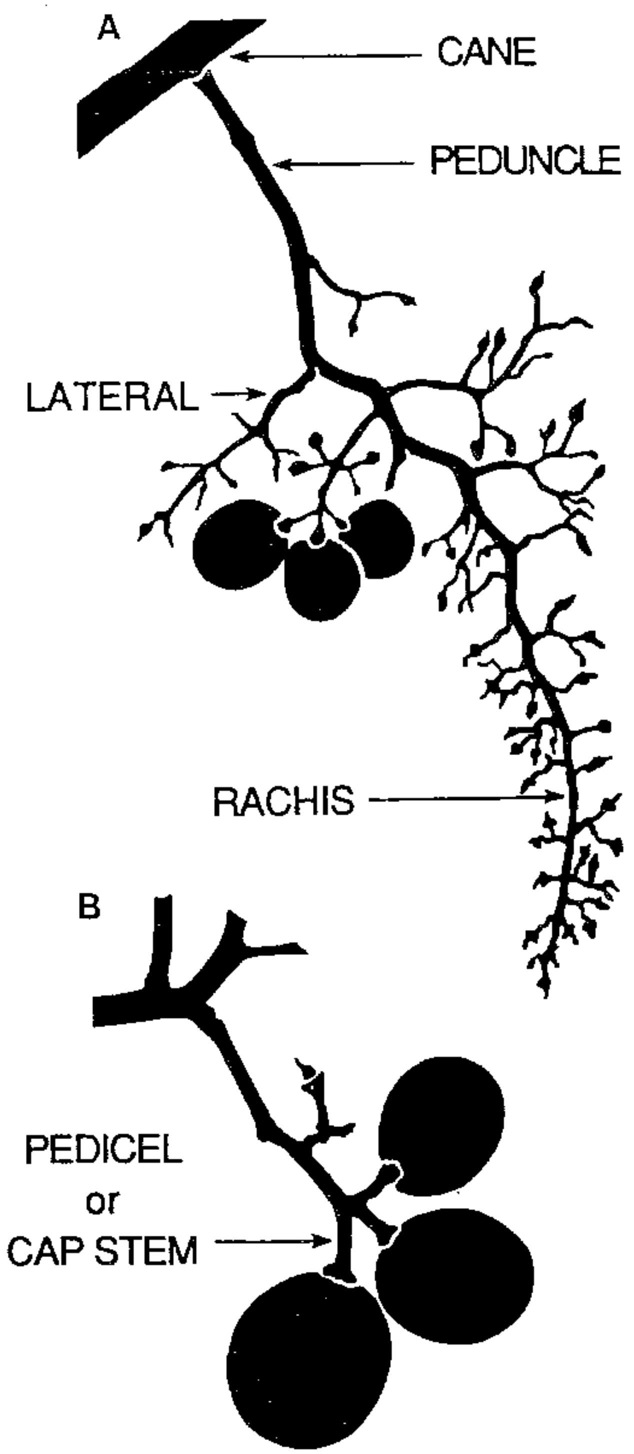


Figure 1 Diagram of grape bunch

A shows the main parts of a grape cluster, **B** shows detail of the berry attachment



Source: Pratt (1988)

Acronyms and abbreviations

Term or abbreviation	Definition
ACT	Australian Capital Territory
ALOP	Appropriate level of protection
BICON	Australia's Biosecurity Import Conditions System
BIRA	Biosecurity Import Risk Analysis
CABI	CAB International, Wallingford, UK
CESAVE Sonora	Comité Estatal de Sanidad Vegetal de Sonora (Sonora's State Committee of Plant Health)
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAFF	Acronym of the former Australian Government Department of Agriculture, Fisheries and Forestry, which is now the Australian Government Department of Agriculture and Water Resources
DAFWA	Government Department of Agriculture and Food, Western Australia
EP	Existing policy
EPPO	European and Mediterranean Plant Protection Organization
FAO	Food and Agriculture Organization of the United Nations
IPC	International Phytosanitary Certificate
IPPC	International Plant Protection Convention
ISPM	International Standard for Phytosanitary Measures
NSW	New South Wales
NPPO	National Plant Protection Organisation
NT	Northern Territory
PIRSA	Department of Primary Industries and Regions, South Australia
PRA	Pest risk analysis
Qld	Queensland
SA	South Australia
SAGARPA	Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación (Mexico's Ministry of Agriculture, Livestock Production, Rural Development, Fisheries and Food)
SENASICA	Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria (Mexico's National Service of Health, Food Safety and Quality)
SPS Agreement	WTO agreement on the Application of Sanitary and Phytosanitary Measures
Tas.	Tasmania
USA	The United States of America

Term or abbreviation	Definition
Vic.	Victoria
WA	Western Australia
WTO	World Trade Organization

Summary

The Australian Government Department of Agriculture and Water Resources has prepared this final report to assess the proposal by Mexico for market access to Australia for fresh table grapes from the state of Sonora, Mexico.

Australia permits the importation of table grapes from Chile, the United States of America (California), New Zealand, China, Korea, Japan and India for human consumption provided they meet Australian biosecurity requirements.

This final report recommends that the importation of fresh table grapes to Australia from all commercial production areas of Sonora be permitted, subject to a range of biosecurity conditions.

This final report contains details of pests with the potential to be associated with the export of table grapes from Sonora, Mexico, and are of quarantine concern to Australia, the risk assessments for the identified quarantine pests and the proposed risk management measures in order to reduce the level of biosecurity risk to an acceptable level.

Nineteen quarantine pests have been identified as requiring risk management measures. Eighteen of these pests are arthropods and one is a pathogen.

The 18 quarantine arthropod pests requiring risk management measures are: *Harmonia axyridis* (Harlequin ladybird), *Homalodisca vitripennis* (glassy-winged sharpshooter), *Draeculacephala minerva* (green sharpshooter), *Graphocephala atropunctata* (blue-green sharpshooter), *Planococcus ficus* (grapevine mealybug), *Planococcus minor* (Pacific mealybug), *Pseudococcus comstocki* (Comstock mealybug), *Pseudococcus jackbeardsleyi* (Jack Beardsley mealybug), *Pseudococcus maritimus* (American grape mealybug), *Platynota stultana* (omnivorous leafroller moth), *Tetranychus kanzawai* (Kanzawa spider mite), *Caliothrips fasciatus* (bean thrips), *Drepanothrips reuteri* (grape thrips), *Frankliniella occidentalis* (western flower thrips), *Anastrepha fraterculus* (South American fruit fly), *Ceratitis capitata* (Mediterranean fruit fly), *Drosophila suzukii* (spotted wing drosophila) and *Daktulosphaira vitifoliae* (grapevine phylloxera).

The quarantine pathogen pest requiring risk management measures is: *Guignardia bidwellii* (black rot).

In addition, two arthropod pests have been identified as pests of human health concern and also require risk management measures. The two pests are: *Cheiracanthium inclusum* (yellow sac spider) and *Latrodectus hesperus* (black widow spider).

The recommended risk management measures take account of regional differences within Australia. Two arthropod pests requiring measures, Pacific mealybug and Kanzawa spider mite, have been identified as quarantine pests for Western Australia, and one arthropod pest, western flower thrips, has been identified as a quarantine pest for the Northern Territory.

This final report recommends a range of risk management measures, combined with operational systems to ensure biosecurity standards are met. These measures will reduce the risks posed by

the 19 quarantine pests and two pests of human health concern, and achieve the ALOP for Australia. These measures include:

- visual inspection and, if detected, remedial action for the ladybird, sharpshooters, mealybugs, moth, spider mite and thrips
- area freedom, irradiation or cold treatment for fruit flies
- area freedom, irradiation, methyl bromide fumigation, systems approach approved by the Australian Government Department of Agriculture and Water Resources or combined sulphur dioxide/carbon dioxide fumigation followed by cold treatment for spotted wing drosophila
- area freedom, sulphur pads or combined sulphur dioxide/carbon dioxide fumigation for grapevine phylloxera
- area freedom or systems approach approved by the Australian Government Department of Agriculture and Water Resources for black rot
- systems approach approved by the Australian Government Department of Agriculture and Water Resources or combined sulphur dioxide/carbon dioxide fumigation for spiders of human health concern.

Written submissions on the draft report were received from five stakeholders. This final report takes into account stakeholder comments on the draft report. The department has made a number of changes to the risk analysis following consideration of the stakeholder comments on the draft report and subsequent review of literature. These changes include:

- the revision of the pest status of *Phakopsora euvitis* in Appendix A to ‘not present in Mexico’ with the result that a pest risk assessment is not required for this pest
- the revision of the pest status of *Eutypa lata* in Australia in Appendix A to ‘not known to be present in Western Australia’, but as no association with grape bunches was found, this pest was not considered further
- the addition of Appendix B ‘Issues raised in stakeholder comments’, which summarises key stakeholder comments and how they were considered in the final report
- minor corrections, rewording and editorial changes for consistency, clarity and web-accessibility.

1 Introduction

1.1 Australia's biosecurity policy framework

Australia's biosecurity policies aim to protect Australia against the risks that may arise from exotic pests entering, establishing and spreading in Australia, thereby threatening Australia's unique flora and fauna, as well as those agricultural industries that are relatively free from serious pests.

The risk analysis process is an important part of Australia's biosecurity policies. It enables the Australian Government to formally consider the level of biosecurity risk that may be associated with proposals to import goods into Australia. If the biosecurity risks do not achieve the appropriate level of protection (ALOP) for Australia, risk management measures are proposed to reduce the risks to an acceptable level. If the risks cannot be reduced to an acceptable level, the goods will not be imported into Australia, until suitable measures are identified.

Successive Australian Governments have maintained a stringent, but not a zero risk, approach to the management of biosecurity risks. This approach is expressed in terms of the ALOP for Australia, which is defined in the *Biosecurity Act 2015* as providing a high level of protection aimed at reducing risk to a very low level, but not to zero.

Australia's risk analyses are undertaken by the Australian Government Department of Agriculture and Water Resources using technical and scientific experts in relevant fields, and involve consultation with stakeholders at various stages during the process.

Risk analyses may take the form of a biosecurity import risk analysis (BIRA) or a non-regulated risk analysis (such as scientific review of existing policy and import conditions, pest-specific assessments, weed risk assessments, biological control agent assessments or scientific advice).

Further information about Australia's biosecurity framework is provided in the *Biosecurity Import Risk Analysis Guidelines 2016* located on the Australian Government Department of Agriculture and Water Resources website.

1.2 This risk analysis

1.2.1 Background

Mexico's National Service of Health, Food Safety and Quality formally requested market access for table grapes from the state of Sonora, Mexico, to Australia in a submission received in 2005 (SAGARPA 2005). This submission included information on pests associated with table grapes in Sonora, Mexico. Further technical information about the monitoring and control of significant pests on table grapes in Mexico, standard commercial production practices for table grapes in Mexico and production statistics were received from Mexico in February 2015 (SAGARPA 2015c).

On 23 June 2014, the department formally announced the commencement of this risk analysis, advising that it would be progressed as a non-regulated risk analysis.

In May 2015, officers from the department visited table grape production areas in Sonora, Mexico, to verify the pest status and observe the harvest, processing and packing procedures for export of table grapes.

1.2.2 Scope

The scope of this risk analysis is to consider the biosecurity risks that may be associated with the importation of commercially produced fresh table grapes (*Vitis vinifera* and hybrids) (henceforth these will be referred to as table grapes), free from trash, from Sonora, Mexico, for human consumption in Australia.

In this risk analysis, table grapes are defined as table grape bunches or clusters, which include peduncles, rachises, laterals, pedicels and berries (Pratt 1988) but not other plant parts (Figure 1). This risk analysis covers all commercially produced table grapes from all table grape producing areas of Sonora, Mexico.

1.2.3 Existing policy

International policy

Import policy exists for table grapes from the United States of America (California) (AQIS 1999, 2000; Biosecurity Australia 2006a; DAFF 2013), Chile (Biosecurity Australia 2005b), New Zealand (Department of Agriculture and Water Resources 2015), China (Biosecurity Australia 2011a), Korea (Biosecurity Australia 2011b), Japan (Department of Agriculture 2014) and India (Australian Government Department of Agriculture and Water Resources 2016).

The import requirements for these commodity pathways can be found at the department's Biosecurity Import Conditions (BICON) website.

The department has considered all the pests previously identified in the existing policies and where relevant, the information in those assessments has been taken into account in this risk analysis.

Domestic arrangements

The Australian Government is responsible for regulating the movement of goods such as plants and plant products into and out of Australia. However, the state and territory governments are responsible for plant health controls within their individual jurisdiction. Legislation relating to resource management or plant health may be used by state and territory government agencies to control interstate movement of plants and plant products. Once plant and plant products have been cleared by Australian Government biosecurity officers, they may be subject to interstate movement conditions. It is the importer's responsibility to identify, and ensure compliance with all requirements.

1.2.4 Contaminating pests

In addition to the pests associated with table grapes from Sonora, Mexico, that are assessed in this risk analysis, there are other organisms that may arrive with the imported commodity. These organisms could include pests of other crops or predators and parasitoids of other arthropods. The department considers these organisms to be contaminating pests that could pose sanitary and phytosanitary risks. These risks are addressed by existing operational procedures that require a 600 unit inspection of all consignments, or equivalent, and investigation of any pest that may be of quarantine concern to Australia.

1.2.5 Consultation

On 23 June 2014, the department notified stakeholders in Biosecurity Advice 2014/08 of the formal commencement of a non-regulated analysis of existing policy to consider a proposal from Mexico for market access to Australia for table grapes from Sonora.

The department has regularly consulted with Mexico's SAGARPA/SENASICA and Australian state and territory government departments during the preparation of this final report.

The department provided a draft pest categorisation to Australian state and territory government departments for their advance consideration of regional pests, prior to the formal release of the draft report.

The draft report was released on 13 January 2016 (Biosecurity Advice 2016/02) for comment and consultation with stakeholders, for a period of 30 days that concluded on 12 February 2016. The department received five submissions on the draft report. All submissions were carefully considered and, where relevant, changes were made to the final report. A summary of major stakeholder comments and how they were considered is contained in Appendix B.

2 Method for pest risk analysis

This chapter sets out the method used for the pest risk analysis (PRA) in this report. The Australian Government Department of Agriculture and Water Resources has conducted this PRA in accordance with the International Standards for Phytosanitary Measures (ISPMs), including ISPM 2: *Framework for pest risk analysis* (FAO 2007) and ISPM 11: *Pest risk analysis for quarantine pests* (FAO 2013) that have been developed under the SPS Agreement (WTO 1995).

A PRA is 'the process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it'(FAO 2015a). A pest is 'any species, strain or biotype of plant, animal, or pathogenic agent injurious to plants or plant products' (FAO 2015a).

Biosecurity risk consists of two major components: the likelihood of a pest entering, establishing and spreading in Australia from imports; and the consequences should this happen. These two components are combined to give an overall estimate of the risk.

Unrestricted risk is estimated taking into account the existing commercial production practices of the exporting country and that, on arrival in Australia, the department will verify that the consignment received is as described on the commercial documents and its integrity has been maintained.

Restricted risk is estimated with phytosanitary measure(s) applied. A phytosanitary measure is 'any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests' (FAO 2015a).

A glossary of the terms used is provided at the back of this report.

The PRAs are conducted in the following three consecutive stages: initiation, pest risk assessment and pest risk management.

2.1 Stage 1 Initiation

Initiation identifies the pest(s) and pathway(s) that are of quarantine concern and should be considered for risk analysis in relation to the identified PRA area.

Appendix A of this risk analysis report lists the pests with the potential to be associated with the exported commodity produced using commercial production and packing procedures. 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. Contaminating pests that have no specific relation to the commodity or the export pathway have not been listed and would be addressed by Australia's current approach to contaminating pests.

The identity of the pests is given in Appendix A. The species name is used in most instances but a lower taxonomic level is used where appropriate. Synonyms are provided where the current scientific name differs from that provided by the exporting country's National Plant Protection Organisation (NPPO) or where the cited literature used a different scientific name.

For this risk analysis, the 'PRA area' is defined 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.

For pests that had been considered by the department in other risk assessments and for which import conditions already exist, this risk analysis considered the likelihood of entry of pests on the commodity and whether existing policy is adequate to manage the risks associated with its import. Where appropriate, the previous risk assessment was taken into consideration when developing this risk analysis.

2.2 Stage 2 Pest risk assessment

A pest risk assessment (for quarantine pests) is the 'evaluation of the probability of the introduction and spread of a pest and of the magnitude of the associated potential economic consequences' (FAO 2015a).

The following three, consecutive steps were used in pest risk assessment:

2.2.1 Pest categorisation

Pest categorisation identifies which of the pests with the potential to be on the commodity are quarantine pests for Australia and require pest risk assessment. A 'quarantine pest' is a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (FAO 2015a).

The pests identified in Stage 1 were categorised using the following primary elements to identify the quarantine pests for the commodity being assessed:

- identity of the pest
- presence or absence in the PRA area
- regulatory status
- potential for establishment and spread in the PRA area
- potential for economic consequences (including environmental consequences) in the PRA area.

The results of pest categorisation are set out in Appendix A. The quarantine pests identified during categorisation were carried forward for pest risk assessment and are listed in Table 4.1.

2.2.2 Assessment of the probability of entry, establishment and spread

Details of how to assess the 'probability of entry', 'probability of establishment' and 'probability of spread' of a pest are given in ISPM 11 (FAO 2013). The SPS Agreement (WTO 1995) uses the term likelihood rather than probability for these estimates. In qualitative PRAs, the department uses the term 'likelihood' for the descriptors it uses for its estimates of likelihood of entry, establishment and spread. The use of the term 'probability' is limited to the direct quotation of ISPM definitions.

A summary of this process is given below, followed by a description of the qualitative methodology used in this risk analysis.

Likelihood of entry

The likelihood of entry describes the likelihood that a quarantine pest will enter Australia as a result of trade in a given commodity, be distributed in a viable state in the PRA area and subsequently be transferred to a host. It is based on pathway scenarios depicting necessary steps in the sourcing of the commodity for export, its processing, transport and storage, its use in Australia and the generation and disposal of waste. In particular, the ability of the pest to survive is considered for each of these various stages.

The likelihood of entry estimates for the quarantine pests for a commodity are based on the use of the existing commercial production, packaging and shipping practices of the exporting country. Details of the existing commercial production practices for the commodity are set out in Chapter 3. These practices are taken into consideration by the department when estimating the likelihood of entry.

For the purpose of considering the likelihood of entry, the department divides this step into two components:

- **Likelihood of importation—** the likelihood that a pest will arrive in Australia when a given commodity is imported.
- **Likelihood of distribution—** the likelihood 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.

Factors considered in the likelihood of importation include:

- distribution and incidence of the pest in the source area
- occurrence of the pest in a life-stage that would be associated with the commodity
- mode of trade (for example, bulk, packed)
- volume and frequency of movement of the commodity along each pathway
- seasonal timing of imports
- pest management, cultural and commercial procedures applied at the place of origin
- speed of transport and conditions of storage compared with the duration of the lifecycle of the pest
- vulnerability of the life-stages of the pest during transport or storage
- incidence of the pest likely to be associated with a consignment
- commercial procedures (for example, refrigeration) applied to consignments during transport and storage in the country of origin, and during transport to Australia.

Factors considered in the likelihood of distribution include:

- commercial procedures (for example, refrigeration) applied to consignments during distribution in Australia

- dispersal mechanisms of the pest, including vectors, to allow movement from the pathway to a host
- whether the imported commodity is to be sent to a few or many destination points in the PRA area
- proximity of entry, transit and destination points to hosts
- time of year at which import takes place
- intended use of the commodity (for example, for planting, processing or consumption)
- risks from by-products and waste.

Likelihood of establishment

Establishment is defined as the 'perpetuation for the foreseeable future, of a pest within an area after entry' (FAO 2015a). In order to estimate the likelihood of establishment of a pest, reliable biological information (for example, lifecycle, host range, epidemiology, survival) is obtained from the areas where the pest currently occurs. The situation in the PRA area can then be compared with that in the areas where it currently occurs and expert judgement used to assess the likelihood of establishment.

Factors considered in the likelihood of establishment in the PRA area include:

- availability of hosts, alternative hosts and vectors
- suitability of the environment
- reproductive strategy and potential for adaptation
- minimum population needed for establishment
- cultural practices and control measures.

Likelihood of spread

Spread is defined as 'the expansion of the geographical distribution of a pest within an area' (FAO 2015a). The likelihood of spread considers the factors relevant to the movement of the pest, after establishment on a host plant or plants, to other susceptible host plants of the same or different species in other areas. In order to estimate the likelihood of spread of the pest, reliable biological information is obtained from areas where the pest currently occurs. The situation in the PRA area is then carefully compared with that in the areas where the pest currently occurs and expert judgement used to assess the likelihood of spread.

Factors considered in the likelihood of spread include:

- suitability of the natural and/or managed environment for natural spread of the pest
- presence of natural barriers
- potential for movement with commodities, conveyances or by vectors
- intended use of the commodity
- potential vectors of the pest in the PRA area
- potential natural enemies of the pest in the PRA area.

Assigning likelihoods for entry, establishment and spread

Likelihoods are assigned to each step of entry, establishment and spread. Six descriptors are used: high; moderate; low; very low; extremely low; and negligible (Table 2.1). Definitions for these descriptors and their indicative probability ranges are given in Table 2.1. The indicative probability ranges are only provided to illustrate the boundaries of the descriptors and are not used beyond this purpose in qualitative PRAs. These indicative probability ranges provide guidance to the risk analyst and promote consistency between different pest risk assessments.

Table 2.1 Nomenclature of qualitative likelihoods

Likelihood	Descriptive definition	Indicative range
High	The event would be very likely to occur	0.7 < to ≤ 1
Moderate	The event would occur with an even likelihood	0.3 < to ≤ 0.7
Low	The event would be unlikely to occur	0.05 < to ≤ 0.3
Very low	The event would be very unlikely to occur	0.001 < to ≤ 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 < to ≤ 0.001
Negligible	The event would almost certainly not occur	0 < to ≤ 0.000001

Combining likelihoods

The likelihood of entry is determined by combining the likelihood that the pest will be imported into the PRA area and the likelihood that the pest will be distributed within the PRA area, using a matrix of rules (Table 2.2). This matrix is then used to combine the likelihood of entry and the likelihood of establishment, and the likelihood of entry and establishment is then combined with the likelihood of spread to determine the overall likelihood of entry, establishment and spread.

For example, if the likelihood of importation is assigned a descriptor of ‘low’ and the likelihood of distribution is assigned a descriptor of ‘moderate’, then they are combined to give a likelihood of ‘low’ for entry. The likelihood for entry is then combined with the likelihood assigned for establishment of ‘high’ to give a likelihood for entry and establishment of ‘low’. The likelihood for entry and establishment is then combined with the likelihood assigned for spread of ‘very low’ to give the overall likelihood for entry, establishment and spread of ‘very low’. This can be summarised as:

importation x distribution = entry [E] **low x moderate = low**

entry x establishment = [EE] **low x high = low**

[EE] x spread = [EES] **low x very low = very low**

Table 2.2 Matrix of rules for combining likelihoods

	High	Moderate	Low	Very low	Extremely low	Negligible
High	High	Moderate	Low	Very low	Extremely low	Negligible
Moderate		Low	Low	Very low	Extremely low	Negligible
Low			Very low	Very low	Extremely low	Negligible
Very low				Extremely low	Extremely low	Negligible
Extremely low					Negligible	Negligible
Negligible						Negligible

Time and volume of trade

One factor affecting the likelihood of entry is the volume and duration of trade. If all other conditions remain the same, the overall likelihood of entry will increase as time passes and the overall volume of trade increases.

The department normally considers the likelihood of entry on the basis of the estimated volume of one year's trade. This is a convenient value for the analysis that is relatively easy to estimate and allows for expert consideration of seasonal variations in pest presence, incidence and behaviour to be taken into account. The consideration of the likelihood of entry, establishment and spread and subsequent consequences takes into account events that might happen over a number of years even though only one year's volume of trade is being considered. This difference reflects biological and ecological facts, for example where a pest or disease may establish in the year of import but spread may take many years.

The use of a one year volume of trade has been taken into account when setting up the matrix that is used to estimate the risk and therefore any policy based on this analysis does not simply apply to one year of trade. Policy decisions that are based on the department's method that uses the estimated volume of one year's trade are consistent with Australia's policy on appropriate level of protection and meet the Australian Government's requirement for ongoing quarantine protection. If there are substantial changes in the volume and nature of the trade in specific commodities then the department will review the risk analysis and, if necessary, provide updated policy advice.

In assessing the volume of trade in this risk analysis, the department assumed that a substantial volume of trade will occur.

2.2.3 Assessment of potential consequences

The objective of the consequence assessment is to provide a structured and transparent analysis of the potential consequences if the pests or disease agents were to enter, establish and spread in Australia. The assessment considers direct and indirect pest effects and their economic and environmental consequences. The requirements for assessing potential consequences are given in Article 5.3 of the SPS Agreement (WTO 1995), ISPM 5 (FAO 2015a) and ISPM 11 (FAO 2013).

Direct pest effects are considered in the context of the effects on:

- plant life or health

- other aspects of the environment.

Indirect pest effects are considered in the context of the effects on:

- eradication, control
- domestic trade
- international trade
- environment.

For each of these six criteria, the consequences were estimated over four geographic levels, defined as:

Local—an aggregate of households or enterprises (a rural community, a town or a local government area).

District—a geographically or geopolitically associated collection of aggregates (generally a recognised section of a state or territory, such as 'Far North Queensland').

Regional—a geographically or geopolitically associated collection of districts in a geographic area (generally a state or territory, although there may be exceptions with larger states such as Western Australia).

National—Australia wide (Australian mainland states and territories and Tasmania).

For each criterion, the magnitude of the potential consequence at each of these levels was described using four categories, defined as:

Indiscernible—pest impact unlikely to be noticeable.

Minor significance—expected to lead to a minor increase in mortality/morbidity of hosts or a minor decrease in production but not expected to threaten the economic viability of production. Expected to decrease the value of non-commercial criteria but not threaten the criterion's intrinsic value. Effects would generally be reversible.

Significant—expected to threaten the economic viability of production through a moderate increase in mortality/morbidity of hosts, or a moderate decrease in production. Expected to significantly diminish or threaten the intrinsic value of non-commercial criteria. Effects may not be reversible.

Major significance—expected to threaten the economic viability through a large increase in mortality/morbidity of hosts, or a large decrease in production. Expected to severely or irreversibly damage the intrinsic 'value' of non-commercial criteria.

The estimates of the magnitude of the potential consequences over the four geographic levels were translated into a qualitative impact score (A-G) using Table 2.3. For example, a consequence with a magnitude of 'significant' at the 'district' level will have a consequence impact score of D.

Table 2.3 Decision rules for determining the consequence impact score based on the magnitude of consequences at four geographic scales

	Geographic scale			
Magnitude	Local	District	Region	Nation
Indiscernible	A	A	A	A
Minor significance	B	C	D	E
Significant	C	D	E	F
Major significance	D	E	F	G

Note: In earlier qualitative PRAs, the scale for the impact scores went from A to F and did not explicitly allow for the rating 'indiscernible' at all four levels. This combination might be applicable for some criteria. In this report, the impact scale of A to F has been changed to become B-G and a new lowest category A ('indiscernible' at all four levels) was added. The rules for combining impacts in Table 2.4 were adjusted accordingly.

The overall consequence for each pest is achieved by combining the qualitative impact scores (A–G) for each direct and indirect consequence using a series of decision rules (Table 2.4). These rules are mutually exclusive, and are assessed in numerical order until one applies.

Table 2.4 Decision rules for determining the overall consequence rating for each pest

Rule	The impact scores for consequences of direct and indirect criteria	Overall consequence rating
1	Any criterion has an impact of 'G'; or more than one criterion has an impact of 'F'; or a single criterion has an impact of 'F' and each remaining criterion an 'E'.	Extreme
2	A single criterion has an impact of 'F'; or all criteria have an impact of 'E'.	High
3	One or more criteria have an impact of 'E'; or all criteria have an impact of 'D'.	Moderate
4	One or more criteria have an impact of 'D'; or all criteria have an impact of 'C'.	Low
5	One or more criteria have an impact of 'C'; or all criteria have an impact of 'B'.	Very Low
6	One or more but not all criteria have an impact of 'B', and all remaining criteria have an impact of 'A'.	Negligible

2.2.4 Estimation of the unrestricted risk

Once the assessment of the likelihood of entry, establishment and spread and for potential consequences are completed, the unrestricted risk can be determined for each pest or groups of pests. This is determined by using a risk estimation matrix (Table 2.5) to combine the estimates of the likelihood of entry, establishment and spread and the overall consequences of pest establishment and spread. Therefore, risk is the product of likelihood and consequence.

When interpreting the risk estimation matrix, note the descriptors for each axis are similar (for example, low, moderate, high) but the vertical axis refers to likelihood and the horizontal axis refers to consequences. Accordingly, a 'low' likelihood combined with 'high' consequences, is not the same as a 'high' likelihood combined with 'low' consequences—the matrix is not symmetrical. For example, the former combination would give an unrestricted risk rating of 'moderate', whereas, the latter would be rated as a 'low' unrestricted risk.

Table 2.5 Risk estimation matrix

Likelihood of pest entry, establishment and spread	Consequences of pest entry, establishment and spread					
	Negligible	Very low	Low	Moderate	High	Extreme
High	Negligible risk	Very low risk	Low risk	Moderate risk	High risk	Extreme risk
Moderate	Negligible risk	Very low risk	Low risk	Moderate risk	High risk	Extreme risk
Low	Negligible risk	Negligible risk	Very low risk	Low risk	Moderate risk	High risk
Very low	Negligible risk	Negligible risk	Negligible risk	Very low risk	Low risk	Moderate risk
Extremely low	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Very low risk	Low risk
Negligible	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Very low risk

2.2.5 The appropriate level of protection (ALOP) for Australia

The SPS Agreement defines the concept of an 'appropriate level of sanitary or phytosanitary protection (ALOP)' as the level of protection deemed appropriate by the WTO Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory.

Like many other countries, Australia expresses its ALOP in qualitative terms. The ALOP for Australia, which reflects community expectations through government policy, is currently expressed as providing a high level of sanitary or phytosanitary protection aimed at reducing risk to a very low level, but not to zero. The band of cells in Table 2.5 marked 'very low risk' represents the ALOP for Australia.

2.3 Stage 3 Pest risk management

Pest risk management describes the process of identifying and implementing phytosanitary measures to manage risks to achieve the ALOP for Australia, while ensuring that any negative effects on trade are minimised.

The conclusions from pest risk assessment are used to decide whether risk management is required and if so, the appropriate measures to be used. Where the unrestricted risk estimate does not achieve the ALOP for Australia, risk management measures are required to reduce this risk to a very low level. The guiding principle for risk management is to manage risk to achieve the ALOP for Australia. The effectiveness of any proposed phytosanitary measures (or combination of measures) is evaluated, using the same approach as used to evaluate the unrestricted risk, to ensure the restricted risk for the relevant pest or pests achieve the ALOP for Australia.

ISPM 11 (FAO 2013) provides details on the identification and selection of appropriate risk management options and notes that the choice of measures should be based on their effectiveness in reducing the likelihood of entry of the pest.

Examples given of measures commonly applied to traded commodities include:

- options for consignments—for example, inspection or testing for freedom from pests, prohibition of parts of the host, a pre-entry or post-entry quarantine system, specified conditions on preparation of the consignment, specified treatment of the consignment, restrictions on end-use, distribution and periods of entry of the commodity
- options preventing or reducing infestation in the crop—for example, treatment of the crop, restriction on the composition of a consignment so it is composed of plants belonging to resistant or less susceptible species, harvesting of plants at a certain age or specified time of the year, production in a certification scheme
- options ensuring that the area, place or site of production or crop is free from the pest—for example, pest-free area, pest-free place of production or pest-free production site
- options for other types of pathways—for example, consider natural spread, measures for human travellers and their baggage, cleaning or disinfestations of contaminated machinery
- options within the importing country—for example, surveillance and eradication programs
- prohibition of commodities—if no satisfactory measure can be found.

Risk management measures are identified for each quarantine pest where the level of biosecurity risk does not achieve the ALOP for Australia. These are presented in Chapter 5: Pest risk management, of this report.

3 Sonora's commercial production practices for table grapes

This chapter provides information on the pre-harvest, harvest and post-harvest practices, considered to be standard practices in Sonora, Mexico, for the production of table grapes for export. The export capability of Sonora, Mexico, is also outlined.

3.1 Assumptions used in estimating unrestricted risk

Mexico provided Australia with information on the standard commercial practices used in the production of table grapes in Sonora. This information was complemented with data from other sources and was taken into consideration when estimating the unrestricted risks of pests that may be associated with the import of this commodity.

The Australian Government Department of Agriculture and Water Resources visited table grape production areas in Sonora in May 2015 to verify the pest status and observe the harvest, processing and packing procedures for export of table grapes. The department's observations and additional information provided during the visit confirmed the production and processing procedures described in this chapter as standard commercial production practices for table grapes for export.

In estimating the likelihood of pest introduction it was assumed that the pre-harvest, harvest and post-harvest production practices for table grapes as described in this chapter are implemented for all production areas in Sonora and for all table grapes within the scope of this analysis. Where a specific practice described in this chapter is not taken into account to estimate the unrestricted risk, it is clearly identified and explained in Chapter 4.

3.2 Climate in production areas

In Mexico, the states that produce wine grapes, table grapes and grapes for drying are Aguascalientes, Baja California, Baja California Sur, Chihuahua, Coahuila, Durango, Guanajuato, Jalisco, Morelos, Nuevo Leon, Puebla, Queretaro, Sonora and Zacatecas (SAGARPA 2015c).

The major table grape growing states are Sonora, Zacatecas, Baja California and Queretaro, with Sonora accounting for over 90 per cent of the total production (Berman & Flores 2013; Wolf & Flores 2014). The municipalities of Hermosillo and Caborca are the main table grape producing areas in Sonora.

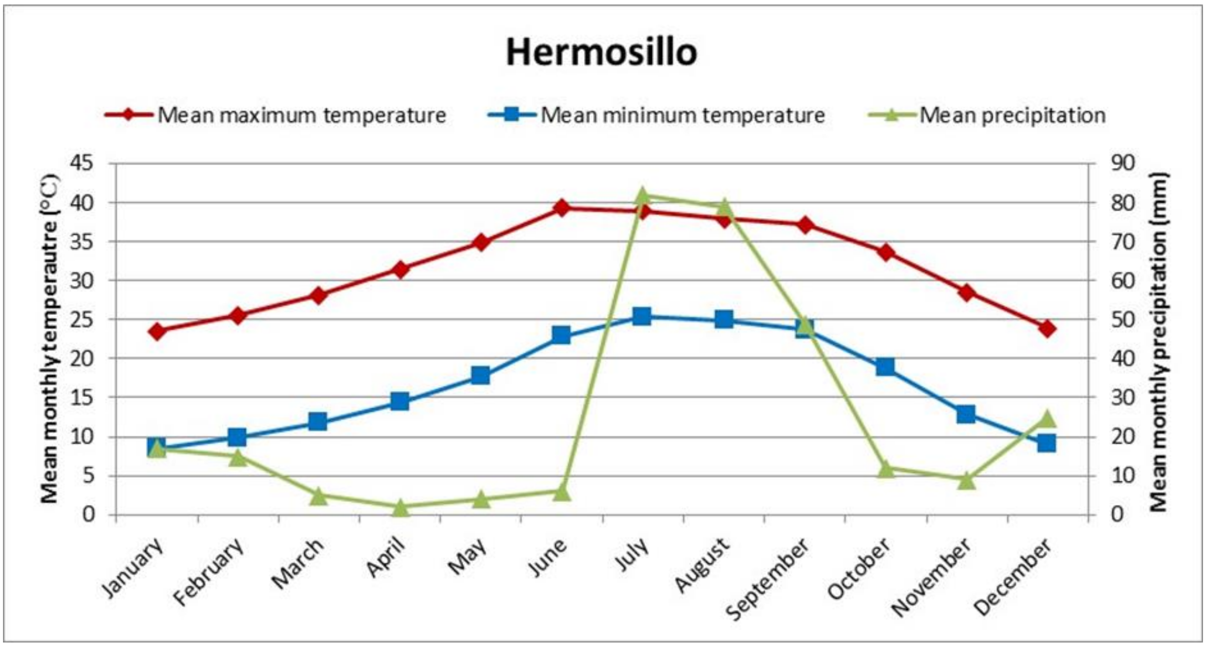
Map 3 Main table grape production areas in Sonora

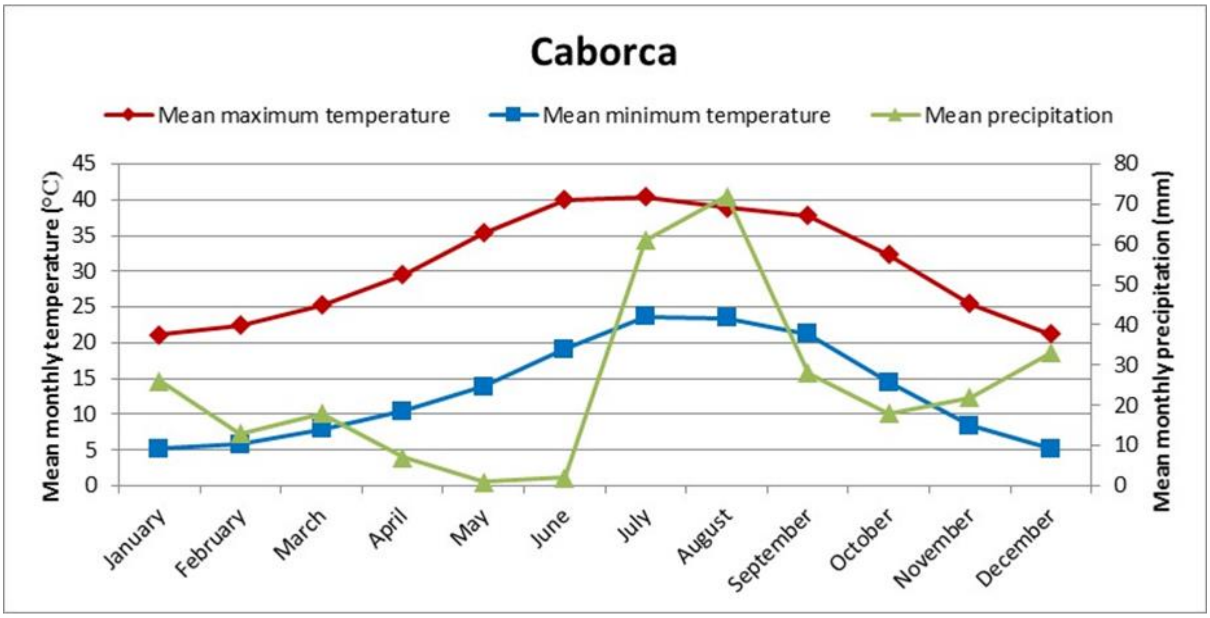
Source: Adapted from SAGARPA (2015b).

Sonora has a desert climate with relatively low rainfall and high temperatures (Emerson 1979). Most of the rain occurs in summer during July and August (Emerson 1979). Mean monthly rainfall and temperature for Caborca and Hermosillo, the main table grape growing municipalities in Sonora (SAGARPA 2005, 2015c), are shown in Figure 2.

The mountains of Baja California protect Sonora from winter and spring rainfall (Emerson 1979). In winter, temperatures range between –3 degrees Celsius and 15 degrees Celsius. In spring, daily temperatures vary widely, ranging from 10 degrees Celsius at night to 38 degrees Celsius during the day. Although temperatures sometimes fall below freezing during winter, it normally does not last long enough to cause any frost injury (Emerson 1979). The hot and dry weather of Sonora is good for table grape production and the climate helps to develop grapes with a high sugar-to-acid ratio (Emerson 1979).

Figure 2 Mean monthly maximum and minimum temperatures and rainfall in the main table grape producing municipalities of Sonora





Source: Weatherbase (2014)

3.3 Pre-harvest

3.3.1 Cultivars

The main table grape cultivars grown in Sonora are Black Seedless, Flame Seedless, Sugarone, Perlette and Red Globe (SAGARPA 2015c) and it is expected that these cultivars are the main cultivars Sonora intends to export. The characteristics of these cultivars are described.

Black Seedless

The berries of Black Seedless are black, seedless and cylindrical in shape. This cultivar has a crunchy texture and the average berry diameter is between 17 and 19 millimetres. The clusters are large (760 to 1000 grams), moderately compact and have a winged and conical trunked shape (SAGARPA 2015; Sonora Spring Grapes 2015). This cultivar is harvested in June to July (Molina Group 2015).

Figure 3 Black Seedless

Source: Sonora Spring Grapes (2015)

Flame Seedless

The berries of Flame Seedless are bright red, spherical, seedless and have high sugar levels. This cultivar has a crunchy texture and the average diameter of berries is 18 millimetres. The clusters are medium to large (550 to 750 grams), moderately compact and have a winged and tapered shape (SAGARPA 2014). This cultivar is harvested in May to July (Molina Group 2015).

Figure 4 Flame Seedless

Source: Sonora Spring Grapes (2015)

Sugarone

Sugarone, also known as Superior, has large, elongated, seedless and light green berries. This cultivar has a crunchy texture. The average berry diameter is 21 to 22 millimetres. The clusters are medium to large (550 to 700 grams), semi-compact, and form a conical, sometimes winged, shape (Molina Group 2015; SAGARPA 2014). This cultivar is harvested in June to July (Molina Group 2015).

Figure 5 Sugarone

Source: SAGARPA (2014)

Perlette

The berries of Perlette are seedless, round or slightly oval and white/green or sometimes slightly yellow and of a crunchy texture. The average berry diameter is between 18 and 19 millimetres. Bunches are 300 to 450 grams, cylindrical and compact (Molina Group 2015; SAGARPA 2014). This cultivar is harvested in May to June (Molina Group 2015).

Figure 6 Perlette

Source: SAGARPA (2014)

Red Globe

Red Globe has a large, round, dark red and shiny berry between 24 and 25 millimetres in diameter and is seeded with a crunchy texture. The bunches are large with an average weight between 1000 and 1200 grams (Molina Group 2015; SAGARPA 2014). This cultivar is harvested in June to July (Molina Group 2015).

Figure 7 Red Globe

Source: SAGARPA (2014)

3.3.2 Cultivation practices

Planting materials

Most rootstocks are produced from cuttings, and scions of commercial cultivars are then grafted on to the rootstock. Rootstock cultivars in Sonora generally need to be resistant to drought, salt accumulation, nematodes and Phylloxera (Emerson 1979; SAGARPA 2015c). The main rootstocks used in Sonora include Harmony, Salt Creek, Freedom and Dogridge (SAGARPA 2015c). Any planting material used must be certified by SAGARPA/SENASICA as free from pests and diseases (SAGARPA 2015c).

Cultivation

Table grape production in Sonora achieves higher yields compared to other growing regions in Mexico due to higher density plantings and the innovative use of technology (Wolf & Flores 2014). There are on average 2500 plants per hectare (Wolf & Flores 2014). The distance between individual rows is 3.6 to 4.0 metres and the distance between individual plants within a row is 0.8 to 1.6 meters (SAGARPA 2015b).

Training and pruning

In Sonora, table grapes are typically grown on a Y-trellis system where shoot positioning is semi-horizontal (Figure 8).

Figure 8 Y-trellis system

Source: Teubes (2014)

Two principal pruning methods, short cane pruning and long cane pruning, are used in Mexico (Emerson 1979). For short cane pruning or severe spur-pruning, straight primary shoots are maintained and only two to three buds are left on a lateral shoot. For long cane pruning, one year old canes that elongated in the previous year are pruned leaving several buds (8 to 15 buds). Pruning usually occurs in December, and the method of cutting and training vines varies widely according to grape cultivars, the distance between rows and the distance between individual plants in a row (Emerson 1979).

In Sonora, practices used to manage the canopy include shoot removal (20 to 25 centimetres), secondary shoot removal, leaf removal and shoot tipping (SAGARPA 2015b).

Intensive berry thinning and cluster trimming are practiced to obtain the crop load levels that enhance high quality table grapes with good berry size and high sugar content.

Use of plant growth regulators

Plant growth regulators are generally used in table grape production to improve production efficiency and grape quality, including berry size, berry colour and cluster quality (Dokoozlian 2000). Plant growth regulators used in Sonora include gibberellic acid, hydrogen cyanamide and etephon (Corrales-Maldonado et al. 2010; SAGARPA 2015b, c). Gibberellic acid can be used to induce cluster elongation, berry thinning or increased berry size (Dokoozlian 2000). In Sonora, growers use hydrogen cyanamide as bud breaking agent in the field (Corrales-Maldonado et al. 2010; SAGARPA 2015c).

Irrigation

All vineyards producing table grapes in Sonora are irrigated (Wolf & Flores 2014). In general, advanced drip irrigation systems are used with self-compensated drips spaced out between 0.5 and 1.0 metres (SAGARPA 2015c).

3.3.3 Pest management

In general, vineyards in Sonora use integrated pest management. Pest management programs include monitoring, preventative sprays and control programs (information collected during a verification visit by the department). Depending on the status of a pest, the management strategies in place are administered at the local, regional or national level. For example, Mexico has a national program for the control, eradication and suppression of fruit flies of economic concern in Mexico which is managed by SENASICA/SAGARPA. At the regional level, pest management programs are managed by CESAVE Sonora, Sonora's State Committee of Plant Health.

Pest trapping and monitoring forms a critical component of the management systems. Mexico has a National Phytosanitary Epidemiological Surveillance Program which has been in operation since 2010 (SAGARPA 2015c). The purpose of this program is:

- to detect phytosanitary risks or regulated pests in a timely manner, in order to prevent their introduction or spread and establishment
- to establish and keep updated records on occurrence, distribution and prevalence of pests that are regulated or considered a phytosanitary risk in Mexico
- to report on the current phytosanitary status of pests that are regulated or considered a phytosanitary risk (SAGARPA-SENASICA 2015).

Currently, 29 pests identified as high risk, which affect a number of agricultural products, are under surveillance under this program (SAGARPA-SENASICA 2015; SAGARPA 2015c).

In Sonora, trapping is conducted for a number of pests including for *Drosophila suzukii*, *Ceratitis capitata*, *Anastrepha* species, *Epiphysas postvittana* and *Lobesia botrana* (SAGARPA 2015a, b). Pest traps are geo-located. Data, including date of trap maintenance, geographical location, inspector's details, vineyard identification and pest species, are collected via smart phone and recorded in a database. Qualified CESAVE Sonora staff are responsible for setting up, monitoring and servicing each trap every 7 to 15 days depending on the pest species (information collected during a verification visit by the department).

General pest traps such as yellow sticky boards are also used. Depending on the nature of the pest found, a suitable control measure will be put in place. For example, detections of *Caliothrips fasciatus* will result in a specific pesticide being applied. For regulated pests such as fruit flies, the detection will be communicated to the local office of SAGARPA/SENASICA and the National Fruit Fly Emergency Protocol will be initiated (information collected during a verification visit by the department).

Continuous surveillance is also conducted at road checkpoints in Sonora located on the main highways on which agricultural products are transported coming from abroad or from other Mexican states (SAGARPA 2005, 2015b). Vehicles are inspected and any type of plant material that is intended to be brought into Sonora must have official documentation and be confirmed free of quarantine pests (SAGARPA 2005).

Sanitation in the vineyards is generally very good and includes weed management and removal and destruction of poor quality fruit and pruned cuttings (information collected during a verification visit by the department).

Export vineyards maintain records which contain information on species of pests monitored, any chemicals used, the date of the monitoring/control activity and the person undertaking the activity (information collected during a verification visit by the department).

3.4 Harvesting and handling procedures

Both in field and packing house systems are used to pack table grapes for export.

In field packing

Harvesting is done by hand. Table grape bunches are harvested when they have reached a minimum of 15 degrees Brix (SAGARPA 2015a). Bunches are picked using scissors, damaged or unsightly berries are trimmed out and bunches are collected into plastic picking tubs (Figure 9).

Figure 9 Picker harvesting table grape bunches

The plastic tubs are taken to a stand, off the ground, at the end of the row. The packer checks the bunches again and then packs them into either plastic bags or clam shell packaging, which are then placed into boxes (Figure 10). Once packed, the boxes are stacked on pallets at the end of the row, awaiting collection to be taken to the packing house (Figure 11).

Figure 10 Field packing of table grapes at the end of the row

Figure 11 Stacks of field packed table grapes awaiting collection

Packing house packing

For table grapes destined to be packed in a packing house, the bunches are picked in the same manner as for field packed table grapes. But rather than packing bunches at the end of the row, the plastic picking tubs are stacked onto pallets at the end of the row (Figure 12) to be collected and taken to a packing house.

Figure 12 Plastic tubs of table grapes awaiting collection to be packed in the packing house

3.5 Post-harvest

3.5.1 Packing house

Packing houses for table grapes in Sonora are of two types, for table grapes that are packed in the field and for those to be packed in the packing house.

Field packed table grapes

Boxes of field packed table grapes are sent to a packing house for final quality checks, labelling, palletising consignments, phytosanitary inspection and certification and finally for transport and export.

Figures 13 to 15 show external and internal views of a packing house for field packed table grapes. Truckloads of boxed table grapes are brought in from the field and unloaded. Traceability details are recorded, including the grower, plot and row. Each box is weighed and labelled. Sometimes sulphur pads are placed in the boxes as a quality control measure for fungal pathogens when destination countries are a long distance away (information collected during a verification visit by the department). The boxes are palletised and the consignment is labelled.

Figure 13 External view of a packing house for field packed table grapes

Figure 14 Boxes of field packed table grapes arriving at the packing house

Figure 15 Inside a packing house for field packed table grapes

Packing house packed table grapes

Some importers and supermarkets in destination countries require table grapes to be packed in a packing house. Packing house packing of table grapes may also be done to process large volumes of table grapes in a short time.

Crates of table grapes are brought in from the field and traceability details recorded. The crates are placed onto conveyer belts for packers to select and place table grape bunches into plastic bags or clam shell packaging which are then placed into boxes. After packing, the process is the same as for field packed table grapes. Each box is weighed, labelled and palletised. The pallet is labelled and is ready for export procedures.

In addition, Mexico advised that before packing it would include an application of compressed air blowing to remove any live arthropods such as adults, juvenile or eggs for table grapes for export to Australia.

Figure 16 Tubs of table grapes arriving at the packing house for packing

Figure 17 Packing house for packing house packed table grapes

Figure 18 Packing line in a packing house

Cold Storage

Once table grapes have been packed and palletised, by either method, they are sent to cool rooms for pre-cooling and cold storage until transport, for export or the domestic market. Figures 19 and 20 show cold storage facilities.

Figure 19 Cold store facility adjacent to a packing house

Figure 20 Consignments of palletised table grapes in a cool room awaiting transport

3.5.2 Export procedures

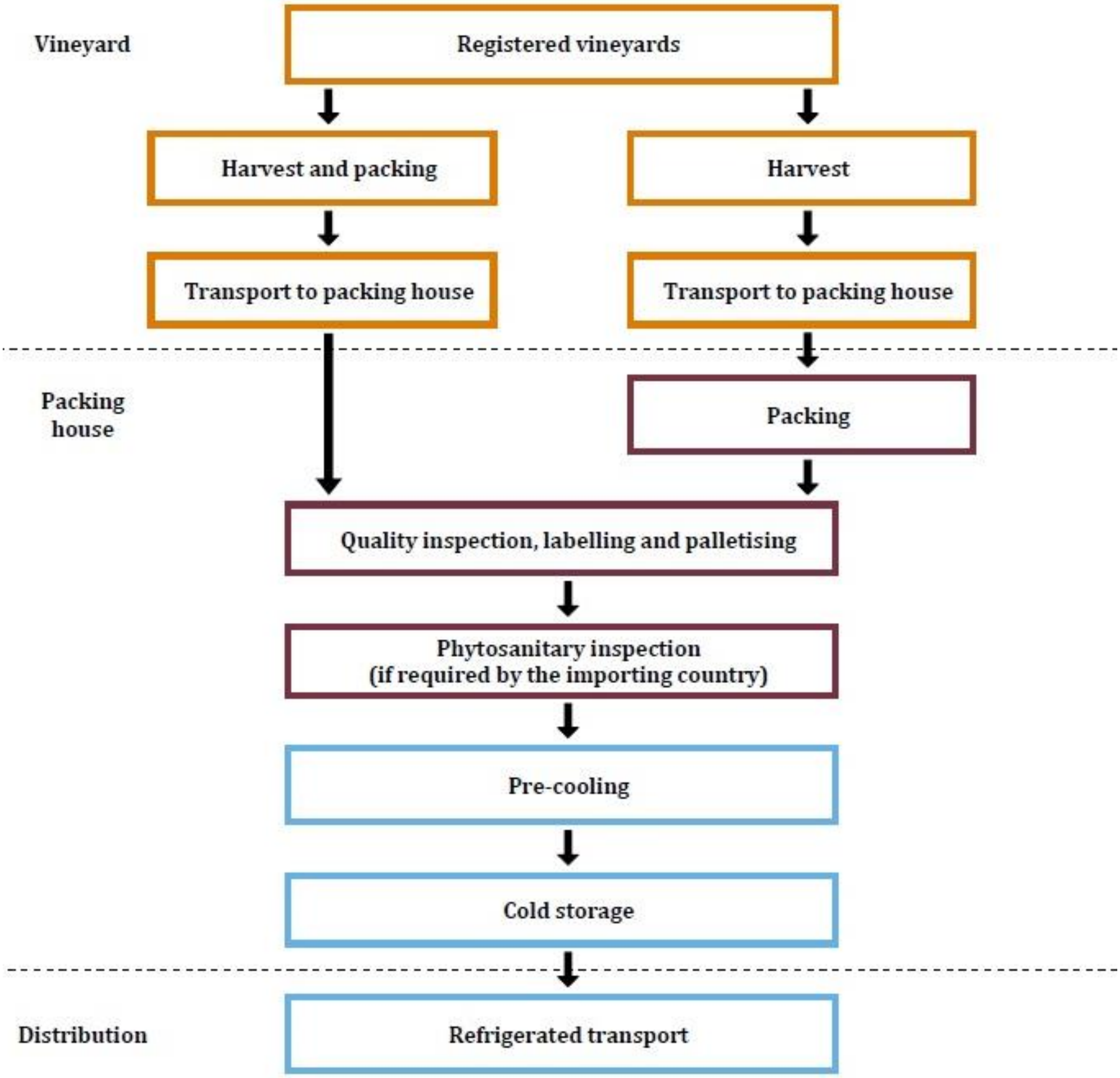
After palletising, consignments for export are issued with a phytosanitary certificate. The phytosanitary certificate is issued by SAGARPA at the request of an officer authorised by Mexico's NPPO (authorised officer) who checks that all phytosanitary conditions have been met for the particular export market. Pallets are shipped in sealed containers and the phytosanitary certificates include the seal number (information collected during a verification visit by the department).

Phytosanitary inspections, if required, are undertaken by authorised officers. Authorised officers hold appropriate qualifications and are trained in the commodity in question. They are continuously evaluated on matters including sampling techniques, checking vineyard and packing house registration, processes for sending samples for off-site identification and dealing with non-compliances, and the process of phytosanitary certification (information collected during a verification visit by the department). The authorised officer provides results of the inspection to SAGARPA.

3.5.3 Transport

Table grapes for export from Mexico are transported by air or sea freight depending on the destination. The table grapes are refrigerated during transport (SAGARPA 2015c).

Figure 21 Summary of vineyard and post-harvest steps for table grapes grown in Sonora for export



3.6 Export capability

3.6.1 Production statistics

Approximately 260 000 tonnes of table grapes are produced annually in Mexico. Table 3.1 shows Mexico's production figures (Berman & Flores 2013; Wolf & Flores 2014). Over 90 per cent of the total production is from Sonora (Berman & Flores 2013; Wolf & Flores 2014).

Table 3.1 Production and per cent share of total table grape production in Mexico in 2012–13 and in 2013–14

	2012–13		2013–14	
State	**Production (metric tonnes)**	**Per cent share**	**Production (metric tonnes)**	**Per cent share**
Sonora	260 904	93.17	238 478	91.89
Zacatecas	12 198	4.36	11 539	4.45
Baja California	3 929	1.40	6 121	2.36
Queretaro	1 829	0.65	2 090	0.81
Total for all of Mexico	279 966	N/A	259 472	N/A

Source: Berman (2013) and Wolf (2014).

3.6.2 Export statistics

From 2010 to 2014, Mexico exported between 137 000 and 171 000 tonnes of table grapes per year (International Trade Centre 2015). Over 98 per cent of Mexico's exported table grapes go to the United States (International Trade Centre 2015). Other export markets include Venezuela, Costa Rica, Guatemala, China, El Salvador, Japan and Brazil (International Trade Centre 2015). Table 3.2 shows volumes of table grapes exported from Mexico from 2010 to 2014 (International Trade Centre 2015).

Table 3.2 Export volumes of table grapes from Mexico to the top eight markets from 2010 to 2014

	Volume (metric tonnes)				
Destination	**2010**	**2011**	**2012**	**2013**	**2014**
United States	169 747	135 662	166 064	147 591	150 612
Venezuela	0	0	0	884	540
Costa Rica	376	309	477	392	372
Guatemala	381	279	330	176	182
China	0	0	71	0	180
El Salvador	78	104	177	139	165
Japan	0	15	122	17	131
Brazil	125	169	106	98	116
Total for top eight export markets	170 707	136 538	167 347	149 297	152 298
Total for all export markets	171 325	137 531	167 854	149 647	152 541

Sources: ITC calculations based on UN COMTRADE statistics (International Trade Centre 2015).

Over 85 per cent of the total exported table grapes from Mexico are from Sonora. Table 3.3 shows volumes of table grapes exported from Sonora from 2010 to 2014 (CESAVE Sonora 2015).

Table 3.3 Volumes of table grapes exported from Sonora from 2010 to 2014

Volume (metric tonnes)				
2010	**2011**	**2012**	**2013**	**2014**
149 037	128 813	150 000	131 515	131 769

Sources: CESAVE Sonora (2015).

3.6.3 Export season

The expected export season is from May to July as table grapes in Sonora are generally harvested during these months (Berman & Flores 2013; SAGARPA 2015b; Wolf & Flores 2014).

4 Pest risk assessments for quarantine pests

Quarantine pests associated with table grapes from Sonora, Mexico, are identified in the pest categorisation process (Appendix A) and are listed in Table 4.1. This chapter assesses the likelihood of the entry (importation and distribution), establishment and spread of these pests and economic, including environmental, consequences these pests may cause if they were to enter, establish and spread in Australia.

Assessments of risks associated with these pests are presented in this chapter unless otherwise indicated.

Most of the pest species and all of the pest groups considered here have been assessed previously by the department. Therefore, the outcomes of previous assessments have been adopted for these pests, unless new information is available that suggests otherwise. Further explanation about the adoption of the outcomes of previous assessments is outlined below.

The likelihood of establishment and of spread of a pest in the PRA area will be comparable regardless of the fresh fruit commodity/country pathway in which the pest is imported into Australia, as these likelihoods relate specifically to events that occur in the PRA area and are independent of the importation pathway. The consequences of a pest are also independent of the importation pathway. For pests that have been assessed previously, the department reviewed the latest literature. If no new information is available that would significantly change the likelihood ratings for establishment and for spread, and the consequences the pests may cause, the ratings given in the previous assessments for these components will be adopted.

The need to reassess the likelihood of distribution for pests that have been assessed previously is considered on a case-by-case basis by comparing factors relevant to the distribution of table grapes from Sonora, Mexico, with those assessed previously. These factors include the commodity type, time of year at which import takes place and availability and susceptibility of hosts during the time of import. After comparing these factors and reviewing the latest literature, the ratings of likelihood of distribution from the previous assessments will be adopted if the department considers that the likelihood of distribution for table grapes from Sonora is be comparable to that given in the previous assessments.

The need to reassess the likelihood of importation for pests that have been assessed previously is also considered on a case-by-case basis by comparing factors relevant to the importation of table grapes from Sonora with those assessed previously. These factors include the commodity type, prevalence of the pest and commercial production practices. After comparing these factors and reviewing the latest literature, the department considers it appropriate not to reassess the likelihood of importation for table grapes from Sonora, Mexico, as it would be comparable to that concluded in the previous assessments. In addition, where changes to the likelihood rating for importation will not alter the unrestricted risk estimate (URE), there is no need to reassess the likelihood of importation.

The URE of achieving or not achieving the ALOP for Australia will be adopted for pests for which the reassessment of both the likelihood of importation and the likelihood of distribution is considered not necessary because the URE outcome would not change from the previous assessment (Table 4.1).

In addition, the biosecurity risks posed by *Drosophila suzukii* from all countries and for all commodities, including table grapes, were previously assessed in the final pest risk analysis report for *Drosophila suzukii* (Department of Agriculture 2013). Therefore, there is no need to reassess this pest here (Table 4.1). A summary of pest information from the final pest risk analysis report for *D. suzukii* is presented in this chapter for convenience.

Some pests identified in this assessment have been recorded in some regions of Australia, and due to interstate quarantine regulations and their enforcement are considered pests of regional concern. The acronym for the state or territory for which the regional pest status is considered, such as 'WA' (Western Australia), is used to identify these organisms.

The pest categorisation process also identified two spiders (*Cheiracanthium inclusum* and *Latrodectus hesperus*) which are of human health concern and known to be associated with table grapes. These spiders have been detected on trade of Mexican table grapes to New Zealand (MPI 2015). Due to their risk to human health, these spiders are considered to require risk management measures. More detail on these pests is provided in Appendix A.

The department is aware of the recent changes in fungal nomenclature which ended the separate naming of different states of fungi with a pleiomorphic life cycle. However, as the nomenclature for these fungi is in a phase of transition and many priorities of names are still to be resolved, this report uses the generally accepted names and provides alternatively used names as synonyms, where required. As official lists of accepted and rejected fungal names become available, these accepted names will be adopted.

Table grapes harvested, packed, stored and transported for export to Australia may need to travel variable distances to ports. Depending on the port of departure and arrival it could take up to four weeks for general sea freight from Mexico to Australia. Table grapes could also potentially be air-freighted from Sonora to Australia. While the assessments of the unrestricted risk undertaken in this risk analysis do not impose any mandatory measures during storage and transport, common commercial practices may impact on the survival of some pests. If these conditions are applied to all consignments for a minimum period of time, then those conditions can be considered as part of the assessment of the unrestricted risk.

Table 4.1 Quarantine pests for table grapes from Sonora, Mexico, for which the URE outcome is adopted from previous assessments

Pest	Common name
Ladybirds [Coleoptera: Coccinellidae]	
Harmonia axyridis (EP)	Harlequin ladybird
Fruit flies [Diptera: Tephritidae]	
Anastrepha fraterculus	South American fruit fly
Ceratitis capitata (EP)	Mediterranean fruit fly
Drosophila [Diptera: Drosophilidae]	
Drosophila suzukii (EP)	Spotted wing drosophila
Sharpshooters [Hemiptera: Cicadellidae]	
Homalodisca vitripennis (EP) **a**	Glassy-winged sharpshooter
Draeculacephala minerva **a**	Green sharpshooter
Graphocephala atropunctata **a**	Blue-green sharpshooter

Pest	Common name
Plant bugs [Hemiptera: Miridae]	
Lygus hesperus (EP)	Western plant bug
Lygus lineolaris (EP)	Tarnished plant bug
Phylloxera [Hemiptera: Phylloxeridae]	
Daktulosphaira vitifoliae (EP)	Grapevine phylloxera
Soft scales [Hemiptera: Coccidae]	
Parthenolecanium corni (EP, WA)	European fruit lecanium
Mealybugs [Hemiptera: Pseudococcidae]	
Planococcus ficus (EP)	Grapevine mealybug
Planococcus minor (EP, WA)	Pacific mealybug
Pseudococcus comstocki (EP)	Comstock mealybug
Pseudococcus jackbeardsleyi (EP)	Jack Beardsley mealybug
Pseudococcus maritimus (EP)	American grape mealybug
Peelminers [Lepidoptera: Gracillariidae]	
Marmara gulosa (EP)	Citrus peelminer
Leafroller moths [Lepidoptera: Tortricidae]	
Platynota stultana (EP)	Omnivorous leafroller
Thrips [Thysanoptera: Thripidae]	
Caliothrips fasciatus (EP)	Bean thrips
Drepanothrips reuteri (EP)	Grape thrips
Frankliniella occidentalis (EP, NT)	Western flower thrips
Spider mites [Trombidiformes: Tetranychidae]	
Tetranychus kanzawai (EP, WA)	Kanzawa spider mite
Fungi	
Guignardia bidwellii (EP)	Black rot
Phomopsis viticola (EP, WA)	Phomopsis cane and leaf spot

EP: Species has been assessed previously and import policy already exists.

WA: Pest of quarantine concern for Western Australia.

NT: Pest of quarantine concern for the Northern Territory.

a as these species can vector *Xylella fastidiosa*, the causal agent of Pierce's disease and a quarantine pest of significant concern to Australia, visual inspection and remedial action will be required to manage the risk of this species for table grapes from Sonora, Mexico. This is consistent with Australia's existing policy for *Homalodisca vitripennis* for table grapes from California.

4.1 Harlequin ladybird

***Harmonia axyridis* (EP)**

Harmonia axyridis was included in the final import policy for table grapes from China (Biosecurity Australia 2011a), from California to Western Australia (DAFF 2013) and from Japan (Department of Agriculture 2014). In these existing policies, the unrestricted risk estimate for *H. axyridis* was assessed as not achieving the ALOP for Australia and therefore specific risk management measures are required for this pest.

The likelihood of establishment and spread of *H. axyridis* in Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of *H. axyridis* are also independent of the importation pathway.

Harmonia axyridis has a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for this pest for table grapes from Sonora is comparable to that for table grapes from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for *H. axyridis* for table grapes from Sonora and those previously assessed. The likelihood of importation for *H. axyridis* for table grapes from Sonora is comparable to that in the previous assessments, particularly to that for table grapes from California to Western Australia (DAFF 2013).

In addition, the department has also reviewed the latest literature (for example Kenis et al. 2016; Roy & Brown 2015; Roy et al. 2016; Torres-Acosta & Sánchez-Peña 2015) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *H. axyridis* in the existing policies.

4.1.1 Unrestricted risk estimate

The unrestricted risk estimate for *H. axyridis* for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for this pest.

4.2 Fruit flies

***Anastrepha fraterculus and Ceratitis capitata* (EP)**

Anastrepha fraterculus (South American fruit fly) and *Ceratitis capitata* (Mediterranean fruit fly, Medfly) belong to the family Tephritidae. They have been grouped together because of their related biology and taxonomy, and are considered to pose a similar risk and to require similar mitigation measures.

Several fruit flies species were assessed previously in a number of existing import policies, for example, in the final import policy for truss tomatoes from the Netherlands (DAFF 2003), sweet oranges from Italy (Biosecurity Australia 2005a), mangoes from India (Biosecurity Australia 2008a), longan and lychee from China and Thailand (DAFF 2004) and table grapes from Chile (Biosecurity Australia 2005b) and from China (Biosecurity Australia 2011a). In these existing policies, the unrestricted risk estimate for fruit flies does not achieve the ALOP for Australia and therefore specific risk management measures are required for the pests.

Although the department acknowledges that Mexico has a national program for the control, eradication and suppression of fruit flies of economic importance in Sonora, Mexico, fruit fly outbreaks do occur from time to time in Mexico. For this reason, the department considers it necessary to include these fruit fly species as pests requiring specific risk management measures. Area freedom is included as one of the measure options for these fruit fly species.

4.2.1 Unrestricted risk estimate

The unrestricted risk estimate for fruit flies for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for these species.

4.3 Spotted wing drosophila

Drosophila suzukii (EP)

The quarantine risks posed by *Drosophila suzukii* from all countries and for all commodities, including table grapes, were previously assessed in the Final pest risk analysis (PRA) report for *Drosophila suzukii* (Department of Agriculture 2013). Therefore, there is no need to reassess this pest here. A summary of pest information from the final PRA report for *D. suzukii* is provided here.

In addition, the department has also reviewed the latest literature (for example Asplen et al. 2015; García-Ávila et al. 2016; Grant & Sial 2016) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out in the final PRA report for *D. suzukii*.

Drosophila suzukii was reported in Mexico in 2011 (NAPPO 2011), and is now reported from the states of Aguascalientes, Baja California, Colima, Guanajuato, Jalisco, Michoacán, Estado de México, Querétaro and Veracruz (CABI 2014; García-Ávila et al. 2016; Lasa & Tadeo 2015). *Drosophila suzukii* is not reported from the state of Sonora and Mexico has domestic movement control in place to restrict the entry of pests, including *D. suzukii*, into Sonora.

Drosophila suzukii preferentially oviposit on ripe fruit but will also oviposit on unripe and overripe fruit (Asplen et al. 2015; Brewer et al. 2012; Kanzawa 1939; Lee et al. 2011). Larvae feeding on very acidic fruit fail to complete development (Kanzawa 1935). In its native and introduced range, *D. suzukii* has been recorded to cause damage to a range of commercial fruits including grapes, cherry, blueberry, red bayberry, strawberry and various caneberries.

On grapes, oviposition trials on wine and table grapes have shown that fully-ripe table grapes can be attacked (Atallah et al. 2014; Maiguashca et al. 2010; Saguez, Lasnier & Vincent 2013). Damaged fruit with low sugar levels will be oviposited in but larvae develop poorly and fail to pupate (Maiguashca et al. 2010). Kanzawa (1939) recorded that different grape varieties sustained different levels of attack and considered skin thickness was the factor that limited oviposition. Oviposition of *D. suzukii* has been reported on a number of grape varieties/cultivars which are 100 per cent *V. vinifera*, such as Gros Coleman, Muscat of Alexandra, Muscat of Hamburg, Foster's seeding Rose de Italy, Kyoshin (Kanzawa 1939), Thompson Seedless (Lee et al. 2011), Black Manuka and Perlette (WSUE 2010). Reports of oviposition on grape varieties/cultivars which are 100 per cent *Vitis labrusca* have not been found. There have been reports of a number of grape varieties/cultivars not being attacked by *D. suzukii*, some of these are 100 per cent *Vitis vinifera* (for example Koshu, Chasselas de Fontainbleau, Golden champion and White Malaga), some are 100 per cent *Vitis labrusca* (for example Concord, Eaton, Niagara and Hostess seedling) (Kanzawa 1939), and some are hybrids between *V. vinifera* and *V. labrusca* for which percentage of *V. vinifera* as parentage range from 25 per cent (for example Early Campbell) (Maiguashca et al. 2010) to 75 per cent (for example Brighton) (Kanzawa 1939).

The risk scenario of concern for *D. suzukii* is the presence of the larvae in mature bunches of table grapes.

4.3.1 Unrestricted risk estimate

Based on the Final pest risk analysis (PRA) report for *Drosophila suzukii* (Department of Agriculture 2013) the unrestricted risk estimate for *D. suzukii* for table grapes from Sonora does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for this pest.

4.4 Grapevine phylloxera

***Daktulosphaira vitifoliae* (EP)**

Daktulosphaira vitifoliae was included in the final import policy for table grapes from China (Biosecurity Australia 2011a), from Korea (Biosecurity Australia 2011b) and from Japan (Department of Agriculture 2014). In these existing policies, the unrestricted risk estimate for *D. vitifoliae* does not achieve the ALOP for Australia and therefore specific risk management measures are required for this pest.

The likelihood of establishment and spread of *D. vitifoliae* in Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of *D. vitifoliae* are also independent of the importation pathway.

Even though the main import windows differ between table grapes from the previous export areas and Sonora, tissues susceptible to infection by *D. vitifoliae* will be available during the expected import window for table grapes from Sonora. Therefore, the likelihood of distribution for this pest for table grapes from Sonora is comparable to that for table grapes from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for *D. vitifoliae* for table grapes from Sonora and those previously assessed. The likelihood of importation for *D. vitifoliae* for table grapes from Sonora is comparable to that in the previous assessments.

In addition, the department has also reviewed the latest literature (for example EFSA Panel on Plant Health 2014; Hoffmann et al. 2015; Wistrom et al. 2016) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *D. vitifoliae* in the existing policies.

4.4.1 Unrestricted risk estimate

The unrestricted risk estimate for *D. vitifoliae* for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for this pest.

4.5 Plant bugs

Lygus hesperus (EP) *and Lygus lineolaris* (EP)

Lygus hesperus and *Lygus lineolaris* were included in the existing import policies for table grapes from California to Western Australia (DAFF 2013) and stone fruit from California, Idaho, Oregon and Washington (Biosecurity Australia 2010). In these existing policies, the unrestricted risk estimate for *L. hesperus and L. lineolaris* was assessed as achieving the ALOP for Australia and therefore no specific risk management measures are required for this pest.

The likelihood of establishment and spread of *L. hesperus* and *L. lineolaris* for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of *L. hesperus* and *L. lineolaris* are also independent of the importation pathway.

Lygus hesperus and *L. lineolaris* have a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for these pests for table grapes from Sonora is comparable to that for commodities from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for *L. hesperus* and *L. lineolaris* for table grapes from Sonora and those previously assessed. Unlike in the previous assessments, although these two *Lygus* species are recorded in Mexico, there are no reports citing infestation of table grapes in Mexico. Therefore, the likelihood of importation of these *Lygus* species for table grapes from Sonora is even lower than that assessed previously.

In addition, the department has also reviewed the latest literature (for example Cooper, Nicholson & Puterka 2014; Cooper & Spurgeon 2015; Hagler et al. 2016) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *L. hesperus and L. lineolaris* in the existing policies.

4.5.1 Unrestricted risk estimate

The unrestricted risk estimate for *L. hesperus and L. lineolaris* for table grapes from Sonora is comparable to the estimates in previous assessments, and achieves the ALOP for Australia. Therefore, no specific risk management measures are required for this pest.

4.6 European fruit lecanium

***Parthenolecanium corni* (EP, WA)**

Parthenolecanium corni is not present in Western Australia and is a pest of regional quarantine concern for that state.

Parthenolecanium corni was included in the final import policy for table grapes from China (Biosecurity Australia 2011a), from California to Western Australia (DAFF 2013) and from Japan (Department of Agriculture 2014). In these existing policies, the unrestricted risk estimate for *P. corni* was assessed as achieving the ALOP for Australia and therefore specific risk management measures are not required for this pest.

The likelihood of establishment and spread of *P. corni* in Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of *P. corni* are also independent of the importation pathway.

Parthenolecanium corni has a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for this pest for table grapes from Sonora is comparable to that for table grapes from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for *P. corni* for table grapes from Sonora and those previously assessed. The likelihood of importation for *P. corni* for table grapes from Sonora is comparable to that in the previous assessments. Also, if the likelihood of importation is assessed as 'high' (the possible highest estimate) for *P. corni* for table grapes from Sonora, the unrestricted risk estimate will still achieve the ALOP for Australia.

In addition, the department has also reviewed the latest literature (for example Camacho 2015; Camacho & Chong 2015; Rakimov, Hoffmann & Malipatil 2015) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *P. corni* in the existing policies.

4.6.1 Unrestricted risk estimate

The unrestricted risk estimate for *P. corni* for table grapes from Sonora is comparable to the estimates in previous assessments, and achieves the ALOP for Australia. Therefore, specific risk management measures are not required for this pest.

4.7 Mealybugs

***Planococcus ficus, Planococcus minor* (EP, WA), *Pseudococcus comstocki* (EP), *Pseudococcus jackbeardsleyi* (EP), *Pseudococcus maritimus* (EP)**

Planococcus ficus (Mediterranean vine mealybug), *Planococcus minor* (Pacific mealybug), *Pseudococcus comstocki* (Comstock mealybug), *Pseudococcus jackbeardsleyi* (Jack Beardsley mealybug) and *Pseudococcus maritimus* (American grape mealybug) belong to the Pseudococcidae or mealybug family. The mealybug species assessed here have been grouped together because of their related biology and taxonomy, and they are considered to pose a similar risk and to require similar mitigation measures.

Planococcus minor is not present in Western Australia and is a pest of regional quarantine concern for that state.

Several mealybug species were assessed previously in a number of existing import policies, for example, in the import policy for mango from Taiwan (Biosecurity Australia 2006c), bananas from the Philippines (Biosecurity Australia 2008b), Unshu mandarin from Japan (Biosecurity Australia 2009), stone fruit from California, Idaho, Oregon and Washington (Biosecurity Australia 2010), and table grapes from Chile (Biosecurity Australia 2005b), from China (Biosecurity Australia 2011a) and from Korea (Biosecurity Australia 2011b). In these existing policies, the unrestricted risk estimate for mealybugs was assessed and does not achieve the ALOP for Australia and therefore specific risk management measures are required for the pests.

The likelihood of establishment and spread of mealybugs in Australia is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of mealybugs are also independent of the importation pathway.

Mealybugs have a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for these pests for table grapes from Sonora is comparable to that for commodities from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for mealybugs for table grapes from Sonora and those previously assessed. The likelihood of importation for mealybugs for table grapes from Sonora is comparable to that in the previous assessments.

In addition, the department has also reviewed the latest literature (for example Daane et al. 2015; Krüger et al. 2015; Liu 2013; Malausa et al. 2016; Mani & Shivaraju 2016) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for mealybugs in the existing policies.

4.7.1 Unrestricted risk estimate

The unrestricted risk estimate for mealybugs for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for these pests.

4.8 Citrus peelminer

Marmara gulosa (EP)

Marmara gulosa was included in the final import policy for table grapes from California to Western Australia (DAFF 2013). In this existing policy, the unrestricted risk estimate for *M. gulosa* was assessed as achieving the ALOP for Australia and therefore specific risk management measures are not required for this pest.

The likelihood of establishment and spread of *M. gulosa* in Australia for table grapes from Sonora is comparable to the previous assessment. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of *M. gulosa* are also independent of the importation pathway.

Marmara gulosa has a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for this pest for table grapes from Sonora is comparable to that for table grapes from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for *M. gulosa* for table grapes from Sonora and those previously assessed. The likelihood of importation for *M. gulosa* for table grapes from Sonora is comparable to that in the previous assessments, particularly to that for table grapes from California to Western Australia. Also, even if the likelihood of importation is assessed as 'high' (the highest possible estimate) for *M. gulosa* for table grapes from Sonora, the unrestricted risk estimate will still achieve the ALOP for Australia.

In addition, the department has also reviewed the latest literature (for example Ayquipa Aycho et al. 2014; Grafton-Cardwell et al. 2014) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *M. gulosa* in the existing policies.

4.8.1 Unrestricted risk estimate

The unrestricted risk estimate for *M. gulosa* for table grapes from Sonora is comparable to the estimates in previous assessments, and achieves the ALOP for Australia. Therefore, specific risk management measures are not required for this pest.

4.9 Omnivorous leafroller

Platynota stultana **(EP)**

Platynota stultana was included in the final import policy for stone fruit from California, Idaho, Oregon and Washington (Biosecurity Australia 2010) and table grapes from California to Western Australia (DAFF 2013). In these existing policies, the unrestricted risk estimate for *P. stultana* does not achieve the ALOP for Australia and therefore specific risk management measures are required for this pest.

The likelihood of establishment and spread of *P. stultana* in Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of *P. stultana* are also independent of the importation pathway.

Platynota stultana has a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for this pest for table grapes from Sonora is comparable to that for table grapes from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for *P. stultana* for table grapes from Sonora and those previously assessed. The likelihood of importation for *P. stultana* for table grapes from Sonora is comparable to that in the previous assessments, particularly to that for table grapes from California to Western Australia (DAFF 2013).

In addition, the department has also reviewed the latest literature (for example Bentley & Coviello 2012; Groenen & Baixeras 2013) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *P. stultana* in the existing policies.

4.9.1 Unrestricted risk estimate

The unrestricted risk estimate for *P. stultana* for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for this pest.

4.10 Thrips

Caliothrips fasciatus **(EP),** ***Drepanothrips reuteri*** **(EP)** ***and Frankliniella occidentalis*** **(EP, NT)**

Caliothrips fasciatus (bean thrips), *Drepanothrips reuteri* (grape thrips) and *Frankliniella occidentalis* (western flower thrips) have been grouped together because of their related biology and taxonomy, and they are considered to pose a similar risk and to require similar mitigation measures.

Frankliniella occidentalis is not present in the Northern Territory and is a pest of quarantine concern for that territory.

Several thrips species, including *D. reuteri* and/or *F. occidentalis*, were assessed previously in a number of existing import policies, for example, in the import policy for stone fruit from New Zealand to Western Australia (Biosecurity Australia 2006b) and table grapes from China (Biosecurity Australia 2011a) and from Japan (Australian Department of Agriculture 2014). In these existing policies, the unrestricted risk estimate for thrips does not achieve the ALOP for Australia and therefore specific risk management measures are required for the pests.

The likelihood of establishment and spread of thrips in Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of thrips are also independent of the importation pathway.

Thrips have a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for these pests for table grapes from Sonora is comparable to that for commodities from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for thrips for table grapes from Sonora and those previously assessed. The likelihood of importation for thrips for table grapes from Sonora is comparable to that in the previous assessments.

In addition, the department has also reviewed the latest literature (for example Arce-Flores, López-Martínez & Gaona-García 2015; Gilbertson et al. 2015; Mani, Shivaraju & Srinivasa Rao 2014; Mound, Nakahara & Tsuda 2016; Nunes Moreira et al. 2014; Ogada, Moualeu & Poehling 2016) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for thrips in the existing policies.

4.10.1 Unrestricted risk estimate

The unrestricted risk estimate for thrips for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for these pests.

4.11 Kanzawa spider mite

***Tetranychus kanzawai* (EP, WA)**

Tetranychus kanzawai is not present in Western Australia and is a pest of regional quarantine concern for that state.

Tetranychus kanzawai was assessed previously in the final import policy for table grapes from China (Biosecurity Australia 2011a), from Korea (Biosecurity Australia 2011b) and from Japan (Department of Agriculture 2014). In these existing policies, the unrestricted risk estimate for *T. kanzawai* does not achieve the ALOP for Australia and therefore specific risk management measures are required for this pest.

The likelihood of establishment and spread of *T. kanzawai* in Western Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Western Australia and are principally independent of the importation pathway. The consequences of *T. kanzawai* are also independent of the importation pathway.

Tetranychus kanzawai has a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for this pest for table grapes from Sonora is comparable to that for table grapes from the previously assessed export areas.

The department considered factors affecting the likelihood of importation for *T. kanzawai* for table grapes from Sonora and those previously assessed. The likelihood of importation for *T. kanzawai* for table grapes from Sonora is comparable to that in the previous assessments.

In addition, the department has also reviewed the latest literature (for example Ghazy et al. 2016; Shim et al. 2016) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *T. kanzawai* in the existing policies.

4.11.1 Unrestricted risk estimate

The unrestricted risk estimate for *T. kanzawai* for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for this pest.

4.12 Black rot

Guignardia bidwellii (EP)

Guignardia bidwellii was included in the final import policies for table grapes from China (Biosecurity Australia 2011a) and Japan (Department of Agriculture 2014). In these existing policies, the unrestricted risk estimate for *G. bidwellii* does not achieve the ALOP for Australia and therefore specific risk management measures are required for this pest.

The likelihood of establishment and spread of *G. bidwellii* in Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Australia and are principally independent of the importation pathway. The consequences of *G. bidwellii* are also independent of the importation pathway.

Guignardia bidwellii has a wide host range and host material is likely to be available all year round in Australia. The likelihood of distribution for this pest for table grapes from Sonora is comparable to that for table grapes from the previous export areas.

The department considered factors affecting the likelihood of importation for *G. bidwellii* for table grapes from Sonora and those previously assessed. Due to the arid and semi-arid climate of Sonora, the likelihood of importation for *G. bidwellii* for table grapes from Sonora could be lower than that in the previous assessments. However, because *G. bidwellii* has been recorded on table grapes in Sonora, the likelihood of importation for *G. bidwellii* for table grapes from Sonora is at least 'very low'. The unrestricted risk estimate for *G. bidwellii* for table grapes from Sonora would only achieve the ALOP for Australia if the likelihood of importation was assessed as 'extremely low' or 'negligible'.

In addition, the department has also reviewed the latest literature (for example Onesti, González-Domínguez & Rossi 2016; Rossi et al. 2015) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *G. bidwellii* in the existing policies.

4.12.1 Unrestricted risk estimate

The unrestricted risk estimate for *G. bidwellii* for table grapes from Sonora is comparable to the estimates in previous assessments, and does not achieve the ALOP for Australia. Therefore, specific risk management measures are required for this pest.

4.13 Phomopsis cane and leaf spot

Phomopsis viticola (EP, WA)

Phomopsis viticola is not present in Western Australia and is a pest of regional quarantine concern for that state.

Phomopsis viticola was included in several existing import policies, for example for table grapes from Chile (Biosecurity Australia 2005b), from China (Biosecurity Australia 2011a), from California to Western Australia (DAFF 2013) and from Japan (Department of Agriculture 2014). In these existing policies, the unrestricted risk estimate for *P. viticola* was assessed as achieving the ALOP for Australia and therefore no specific risk management measures are required for this pest.

The likelihood of establishment and spread of *P. viticola* in Western Australia for table grapes from Sonora is comparable to previous assessments. These likelihoods relate specifically to events that occur in Western Australia and are principally independent of the importation pathway. The consequences of *P. viticola* are also independent of the importation pathway

The likelihood of distribution was reassessed for table grapes from Sonora to take account of new information available as well as the differences in the expected import window compared to that assessed previously. Similar to table grapes from California, the main import window for table grapes from Sonora occurs during a period when Australian grapevines are considered less susceptible to infection and climatic conditions in most areas of Western Australia are warm and dry and not conducive to disease development. Therefore, the likelihood of distribution for *P. viticola* for table grapes from Sonora is comparable to that for table grapes from California to Western Australia.

The department considered factors affecting the likelihood of importation for *P. viticola* for table grapes from Sonora and those previously assessed. The likelihood of importation for *P. viticola* for table grapes from Sonora is comparable or at least not higher than the highest rating in the previous assessments. Also, if the likelihood of importation is assessed as 'high' (the possible highest rating) for *P. viticola* for table grapes from Sonora, the unrestricted risk estimate will still achieve the ALOP for Australia.

In addition, the department has also reviewed the latest literature (for example Emmett, Wicks & Baker 2015; Smith, Bettiga & Gubler 2016; Úrbez-Torres et al. 2013) and no new information is available that would significantly change the risk ratings for importation, distribution, establishment, spread and consequences as set out for *P. viticola* in the existing policies.

4.13.1 Unrestricted risk estimate

The unrestricted risk estimate for *P. viticola* for table grapes from Sonora is comparable to the estimates in previous assessments, and achieves the ALOP for Australia. Therefore, no specific risk management measures are required for this pest.

4.14 Pest risk assessment conclusions

Key to Table 4.2 (starting next page)

Genus species (EP): pests for which policy already exists. The outcomes of previous assessments and/or reassessments in this risk analysis are presented in Table 4.2

Genus species (Acronym for state/territory): state/territory in which regional quarantine pests have been identified

Likelihoods for entry, establishment and spread

N	negligible
EL	extremely low
VL	very low
L	low
M	moderate
H	high
EES	overall likelihood of entry, establishment and spread

Assessment of consequences from pest entry, establishment and spread

PLH	plant life or health	
OE	other aspects of the environment	
EC	eradication, control	
DT	domestic trade	
IT	international trade	
ENC	environmental and non-commercial	
A-G	consequence impact scores are detailed in section 2.2.3	
	A	Indiscernible at the local level
	B	Minor significance at the local level
	C	Significant at the local level
	D	Significant at the district level
	E	Significant at the regional level
	F	Significant at the national level
	G	Major significance at the national level
URE	unrestricted risk estimate. This is expressed on an ascending scale from negligible to extreme.	

Table 4.2 Summary of unrestricted risk estimates for quarantine pests associated with table grapes from Sonora, Mexico, for which the URE outcome is adopted from previous assessments

Pest name	URE outcome
Ladybirds [Coleoptera: Coccinellidae]	
Harmonia axyridis (EP)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Fruit flies [Diptera: Tephritidae]	
Anastrepha fraterculus	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Ceratitis capitata (EP)	
Spotted wing drosophila [Diptera: Drosophilidae]	
Drosophila suzukii (EP)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Grape Phylloxera [Hemiptera: Phylloxeridae]	
Daktulosphaira vitifoliae (EP)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Plant Bugs [Hemiptera: Miridae]	
Lygus hesperus (EP)	The URE outcome, which achieves the ALOP for Australia, has been adopted from existing policy
Lygus lineolaris (EP)	
European fruit lecanium [Hemiptera: Coccidae]	
Parthenolecanium corni (EP, WA)	The URE outcome, which achieves the ALOP for Australia, has been adopted from existing policy
Mealybugs [Hemiptera: Pseudococcidae]	
Planococcus ficus (EP)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Planococcus minor (EP, WA)	
Pseudococcus comstocki (EP)	
Pseudococcus jackbeardsleyi (EP)	
Pseudococcus maritimus (EP)	
Citrus peelminer [Lepidoptera: Gracillariidae]	
Marmara gulosa (EP)	The URE outcome, which achieves the ALOP for Australia, has been adopted from existing policy

Pest name	URE outcome
Omnivorous leafroller [Lepidoptera: Tortricidae]	
Platynota stultana (EP)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Thrips [Thysanoptera: Thripidae]	
Caliothrips fasciatus (EP)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Drepanothrips reuteri (EP)	
Frankliniella occidentalis (EP, NT)	
Spider mite [Trombidiformes: Tetranychidae]	
Tetranychus kanzawai (EP, WA)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Fungi	
Guignardia bidwellii (EP)	The URE outcome, which does not achieve the ALOP for Australia, has been adopted from existing policy
Phomopsis viticola (EP, WA)	The URE outcome, which achieves the ALOP for Australia, has been adopted from existing policy

5 Pest risk management

This chapter provides information on the management of quarantine pests identified with an unrestricted risk level that does not achieve the appropriate level of protection (ALOP) for Australia. The recommended risk management measures are described in this chapter.

5.1 Pest risk management measures

Pest risk management evaluates and selects options for measures to reduce the risk of entry, establishment or spread of quarantine pests for Australia where they have been assessed to have an unrestricted risk level that does not achieve the ALOP for Australia. In calculating the unrestricted risk, existing commercial production practices in Sonora, Mexico, have been considered, as have post-harvest procedures and the packing of fruit.

In addition to Sonora's existing commercial production practices for table grapes and minimum border procedures in Australia, specific pest risk management measures, including operational systems, are recommended to achieve the ALOP for Australia.

In this chapter, the Australian Government Department of Agriculture and Water Resources has identified risk management measures that may be applied to consignments of table grapes sourced from Sonora, Mexico. Finalisation of the import conditions may be undertaken with input from the Australian states and territories as appropriate.

5.1.1 Pest risk management for quarantine pests

The pest risk analysis identified the quarantine pests listed in Table 5.1 as having an unrestricted risk level that does not achieve the ALOP for Australia. Therefore, risk management measures are required to manage the risks posed by these pests.

Table 5.1 Risk management measures recommended for quarantine pests and pests of human health concern for table grapes from Sonora, Mexico

Pest	Common name	Measures
Arthropods		
Harmonia axyridis (EP)	Harlequin ladybird	Visual inspection and, if detected, remedial action **a** (for example methyl bromide fumigation)
Homalodisca vitripennis (EP)	Glassy-winged sharpshooter	
Draeculacephala minerva	Green sharpshooter	
Graphocephala atropunctata	Blue-green sharpshooter	
Planococcus ficus (EP)	Grapevine mealybug	
Planococcus minor (EP, WA)	Pacific mealybug	
Pseudococcus comstocki (EP)	Comstock mealybug	
Pseudococcus jackbeardsleyi (EP)	Jack Beardsley mealybug	
Pseudococcus maritimus (EP)	American grape mealybug	
Platynota stultana (EP)	Omnivorous leafroller	
Tetranychus kanzawai (EP, WA)	Kanzawa spider mite	
Caliothrips fasciatus (EP)	Bean thrips	
Drepanothrips reuteri (EP)	Grape thrips	
Frankliniella occidentalis (EP, NT)	Western flower thrips	
Anastrepha fraterculus	South American fruit fly	Area freedom **b** OR Irradiation OR Cold treatment
Ceratitis capitata (EP)	Mediterranean fruit fly	
Drosophila suzukii (EP)	Spotted wing drosophila	Area freedom **b** OR Systems approach OR Irradiation OR SO_2/CO_2 fumigation followed by cold treatment OR Methyl bromide fumigation
Daktulosphaira vitifoliae (EP)	Grapevine phylloxera	Area freedom **b** OR Sulphur pads OR SO_2/CO_2 fumigation
Pathogens		
Guignardia bidwellii (EP)	Black rot	Area freedom **b** OR Systems approach
Pests of human health concern (see Appendix A for further detail)		
Cheiracanthium inclusum (EP)	Yellow sac spider	Systems approach **c** OR SO_2/CO_2 fumigation
Latrodectus hesperus (EP)	Black widow spider	

a Remedial action by SENASICA may include withdrawing the consignment from export to Australia or applying approved treatment of the consignment to ensure that the pest is no longer viable. **b** Area freedom may include pest free areas, pest free places of production or pest free production sites. **c** If the pests are detected repeatedly, the Australian Government Department of Agriculture and Water Resources would review this recommended measure.
(EP) Species has been assessed previously and import policy already exists.
(WA) Pest of quarantine concern for Western Australia.
(NT) Pest of quarantine concern for the Northern Territory.

Risk management measures recommended here build on the existing policies for the import of table grapes from California (AQIS 1999, 2000; Biosecurity Australia 2006a; DAFF 2013), Chile (Biosecurity Australia 2005b), China (Biosecurity Australia 2011a), Korea (Biosecurity Australia 2011b) and Japan (Department of Agriculture 2014), which include most of the pests identified in Table 5.1. Among these existing policies, there has been trade in table grapes from California and Korea, with over 90 000 tonnes imported into Australia between 2010 and 2016. The risk management measures implemented for table grapes from California and Korea have successfully managed pests associated with the pathway. Most of the risk management measures recommended for table grapes from Sonora are the same as those used for table grapes from California and Korea, for example sulphur pads for grapevine phylloxera, and a combined sulphur dioxide/carbon dioxide fumigation followed by cold treatment for spotted wing drosophila.

This non-regulated analysis report recommends that when the following risk management measures are followed, the restricted risk for all identified quarantine pests assessed achieve the appropriate level of protection (ALOP) for Australia. They include:

- visual inspection and, if detected, remedial action for the ladybird, sharpshooters, mealybugs, moth, spider mite and thrips
- area freedom, irradiation or cold treatment for fruit flies
- area freedom, irradiation, methyl bromide fumigation, systems approach approved by the Australian Government Department of Agriculture and Water Resources or combined sulphur dioxide/carbon dioxide fumigation followed by cold treatment for spotted wing drosophila
- area freedom, sulphur pads or combined sulphur dioxide/carbon dioxide fumigation for grapevine phylloxera
- area freedom or systems approach approved by the Australian Government Department of Agriculture and Water Resources for black rot
- systems approach approved by the Australian Government Department of Agriculture and Water Resources or combined sulphur dioxide/carbon dioxide fumigation for spiders of human health concern.

Management for Harlequin ladybird, sharpshooters, mealybugs, omnivorous leaf roller, Kanzawa spider mite and thrips

To manage the risks from *Harmonia axyridis*, *Homalodisca vitripennis*, *Draeculacephala minerva*, *Graphocephala atropunctata*, *Planococcus ficus*, *Planococcus minor*, *Pseudococcus comstocki*, *Pseudococcus jackbeardsleyi, Pseudococcus maritimus, Platynota stultana*, *Tetranychus kanzawai*, *Caliothrips fasciatus*, *Drepanothrips reuteri* and *Frankliniella occidentalis* the Australian Government Department of Agriculture and Water Resources recommends visual inspection and, if detected, remedial action as a measure for these pests. The objective of the recommended visual inspection is to ensure that any consignments of table grapes from Sonora, Mexico, infested with these pests are identified and subjected to appropriate remedial action. The appropriate remedial action will reduce the risk associated with these pests to at least 'very low', which would achieve the ALOP for Australia.

Planococcus minor and *Tetranychus kanzawai* are quarantine pests only for Western Australia and *Frankliniella occidentalis* is a quarantine pest only for the Northern Territory.

Recommended measure. Pre-export visual inspection and, if detected, remedial action by SENASICA

All table grape consignments for export to Australia must be inspected by SENASICA, Mexico's NPPO, and found free of these quarantine arthropod pests. Export lots or consignments found to contain any of these pests must be subject to remedial action. Remedial action may include withdrawing the lots or consignments from export to Australia or, if available, applying approved treatment to the export lots or consignments to ensure that the pest is no longer viable.

Management for *Anastrepha fraterculus* and *Ceratitis capitata*

The Australian Government Department of Agriculture and Water Resources recommends the options of area freedom, irradiation or cold disinfestation treatment as measure to reduce the risks associated with *A. fraterculus* and *C. capitata*. The objective of each of these measures is to reduce the likelihood of importation of these pests to at least 'extremely low'. The restricted risk would then be reduced to at least 'very low', which would achieve the ALOP for Australia.

Recommended measure 1. Area freedom

The requirements for establishing pest free areas or pest free places of production are set out in ISPM 4: *Requirements for the establishment of pest free areas* (FAO 1995) and ISPM 10: *Requirements for the establishment of pest free places of production and pest free production sites* (FAO 1999) and more specifically in ISPM 26: *Establishment of pest free areas for fruit flies* (Tephritidae) (FAO 2015b).

The Australian Government Department of Agriculture and Water Resources recognises the state of Sonora, Mexico, as free from fruit flies of economic importance, including South American fruit fly and Mediterranean fruit fly. Under the area freedom option, SENASICA is to be responsible for maintaining area freedom which includes monitoring and trapping for fruit flies and regulating the movement of risk material on an ongoing basis. SENASICA would be required to notify the Australian Government Department of Agriculture and Water Resources of a detection of any fruit fly species (Tephritidae) of economic importance in Sonora within 48 hours. The Australian Government Department of Agriculture and Water Resources would then assess the species and number of individual flies detected and the circumstances of the detection, before advising SENASICA of the action to be taken.

In the case of an outbreak of a fruit fly of economic importance in Sonora, table grapes sourced from the area within a certain distance of the outbreak area (suspension area) will require a mandatory treatment for the fruit fly species contributing to the outbreak. In the case of an outbreak of *A. fraterculus* or *C. capitata*, table grapes sourced from the area within a 7.5 kilometre radius of the outbreak area will require a mandatory treatment for the relevant species. In the case of an outbreak of any other fruit fly species of economic importance, an appropriate suspension area would need to be agreed on between the Australian Government Department of Agriculture and Water Resources and SENASICA.

SENASICA is required to report to the Australian Government Department of Agriculture and Water Resources of any actions undertaken, including eradication activities. Reinstatement of the area freedom status will be subject to the joint investigation between SENASICA and the Australian Government Department of Agriculture and Water Resources on the eradication outcomes.

If any fruit flies of economic importance are detected at on-arrival inspection, trade would be suspended immediately, pending the outcome of an investigation.

Recommended measure 2. Irradiation

Irradiation treatment is considered a suitable measure for *A. fraterculus* and *C. capitata* and other fruit fly of economic importance. The treatment schedule of minimum absorbed dose for the respective fruit fly species as set in ISPM 28 Annex 7: *Irradiation treatment for fruit flies of the family Tephritidae (generic)* (FAO 2009).

Recommended measure 3. Cold disinfestation treatment

In the case of an outbreak of *A. fraterculus* and/or *C. capitata* or other fruit fly of economic importance, cold disinfestation treatment can be used as a treatment. Cold treatments can be conducted pre-export in Sonora or in-transit.

In the case of an outbreak of *A. fraterculus*, the following treatment regimes consistent with the USDA Treatment Manual (USDA 2015) for *A. fraterculus* on a range of commodities, including grapes, can be used:

- 0.00 degrees Celsius or below for 11 days, or
- 0.56 degrees Celsius or below for 13 days, or
- 1.11 degrees Celsius or below for 15 days, or
- 1.67 degrees Celsius or below for 17 days.

In the case of an outbreak of *C. capitata*, the following treatment regimes consistent with previous policies for *C. capitata* on a range of commodities can be used:

- 0.0 degrees Celsius or below for 10 days, or
- 0.6 degrees Celsius or below for 11 days, or
- 1.1 degrees Celsius or below for 12 days, or
- 1.7 degrees Celsius or below for 14 days, or
- 2.2 degrees Celsius or below for 16 days, or
- 3 degrees Celsius or below for 20 days.

Management for *Drosophila suzukii*

The Australian Government Department of Agriculture and Water Resources recommends the options of area freedom, systems approach or fruit treatment (irradiation, methyl bromide fumigation or combined SO_2/CO_2 fumigation followed by cold disinfestation treatment) as management measures. The objective of each of these measures is to reduce the likelihood of importation of *D. suzukii* to at least 'extremely low'. The restricted risk would then be reduced to at least 'very low', which would achieve the ALOP for Australia.

Fruit treatments would need to be applied prior to arrival in Australia to ensure that any live adult flies in consignments of fruit do not enter Australia.

Recommended measure 1. Area freedom

The requirements for establishing pest free areas or pest free places of production are set out in ISPM 4: *Requirements for the establishment of pest free areas* (FAO 1995) and ISPM 10: *Requirements for the establishment of pest free places of production and pest free production sites* (FAO 1999).

If area freedom from *D. suzukii* could be demonstrated for any areas in Sonora, the likelihood of importation of this pest with table grapes sourced from those areas would be reduced to at least 'extremely low'. The restricted risk would then be reduced to at least 'very low', which would achieve the ALOP for Australia.

The Australian Government Department of Agriculture and Water Resources recognises the municipalities of Caborca, Carbo, Empalme, Guaymas, Hermosillo, Pitiquito and San Miguel de Horcasitas as free from *D. suzukii*, based on a system of trapping and regulations on the movement of risk material. SENASICA needs to ensure that this area freedom management system is maintained.

Under the area freedom option, SENASICA would be required to notify the Australian Government Department of Agriculture and Water Resources of a detection of any *D. suzukii* in pest free area within 48 hours. The Australian Government Department of Agriculture and Water Resources would then assess the species and number of individual flies detected and the circumstances of the detection, before advising SENASICA of the action to be taken. If fruit flies are detected at on-arrival inspection, trade would be suspended immediately, pending the outcome of an investigation.

Recommended measure 2. Systems approach

A systems approach that uses the integration of different risk management measures, at least two of which act independently, and which cumulatively achieve the required level of phytosanitary protection could be used to reduce the risk of *D. suzukii* being imported to Australia with consignments of table grapes. More information on a systems approach is set out in ISPM 14: *The use of integrated measures in a systems approach for pest risk management* (FAO 2002).

The Australian Government Department of Agriculture and Water Resources considers that a systems approach to address the risks posed by *D. suzukii* on table grapes may be feasible. The approach could be based on a combination of fruit protection, for example fruit bagging, vineyard preventative measures and monitoring, and pest control with post-harvest measures. The approach could be used to progressively reduce the risk of infested fruit being imported into Australia with consignments of table grapes.

Should Mexico wish to use a systems approach as a measure to manage the risk posed by *D. suzukii*, SENASICA would need to submit to Australia a proposal outlining components of the system and how these components will address the risks posed by this pest. The Australian Government Department of Agriculture and Water Resources will consider the effectiveness of any system proposed by SENASICA.

Recommended measure 3. Irradiation

Irradiation treatment is considered a suitable measure for *D. suzukii* (Follett, Swedman & Price 2014). The Australian Government Department of Agriculture and Water Resources recommends a treatment schedule of 150 gray minimum absorbed dose, consistent with ISPM 28 Annex 7: *Irradiation treatment for fruit flies of the family Tephritidae (generic)* (FAO 2009). Although lower doses (78 gray) have been shown to induce sterility of all immature life stages associated with fruit, adults can successfully emerge from irradiated pupae. The detection of a sterilised *D. suzukii* adult post border would result in regulatory actions. A dose of 150 gray would make adult emergence from irradiated fruit an unlikely event.

Recommended measure 4. Combined SO_2/CO_2 fumigation followed by cold disinfestation treatment

The Australian Government Department of Agriculture and Water Resources reviewed the efficacy data in support of a combination treatment of SO_2/CO_2 fumigation followed by a cold disinfestation treatment (listed below), and considered it suitable to manage the risk of *D. suzukii* in table grapes (*Vitis vinifera*). The treatment is:

- 1 per cent sulphur dioxide (SO_2) and 6 per cent carbon dioxide (CO_2) by volume for 30 minutes, at a pulp temperature of 15.6 degrees Celsius or greater and a maximum chamber load of 30 per cent, followed by
- a cold treatment for six days or more at a pulp temperature of –0.50 degrees Celsius plus or minus 0.50 degrees Celsius.

OR

- 1 per cent sulphur dioxide (SO_2) and 6 per cent carbon dioxide (CO_2) by volume for 30 minutes, at a pulp temperature of 15.6 degrees Celsius or greater and a maximum chamber load of 30 per cent, followed by
- a cold treatment for twelve days or more at a pulp temperature of 0.9 degrees Celsius plus or minus 0.50 degrees Celsius.

Recommended measure 5. Methyl bromide fumigation

The Australian Government Department of Agriculture and Water Resources reviewed the efficacy data in support of methyl bromide fumigation and considered it suitable to manage the risk of *D. suzukii* in table grapes (*Vitis vinifera*). The treatment is:

- 40 grams of methyl bromide per cubic meter for two hours at a pulp temperature of 16 degrees Celsius or greater and a maximum chamber load of 50 per cent.

Management for *Daktulosphaira vitifoliae*

The Australian Government Department of Agriculture and Water Resources recommends the options of area freedom or fruit treatment that is considered to be effective against all life stages of *D. vitifoliae* (sulphur pads or combined SO_2/CO_2 fumigation) as measures to reduce the risk associated with this pest to at least 'very low', which would achieve the ALOP for Australia.

Recommended measure 1. Area freedom

The requirements for establishing pest free areas or pest free places of production are set out in ISPM 4: *Requirements for the establishment of pest free areas* (FAO 1995) and ISPM 10: *Requirements for the establishment of pest free places of production and pest free production sites* (FAO 1999).

If area freedom from *D. vitifoliae* could be demonstrated for any areas in Sonora, the likelihood of importation of this pest with table grapes sourced from those areas would be reduced to at least 'extremely low'. The restricted risk would then be reduced to 'negligible', which would achieve the ALOP for Australia.

Recommended measure 2. Sulphur pads

Commercial sulphur pads with proven efficacy against *D. vitifoliae* packed inside the plastic liner in all cartons of table grapes for export can be used to manage the risk posed by this pest. The sulphur pads must be a registered product containing a minimum of 970 grams per kilogram anhydrous sodium metabisulphite used at the rate specified on the label (PIRSA 2010).

The inclusion of sulphur pads in all cartons of table grapes for export is to reduce the survival of *D. vitifoliae* associated with packed table grapes and the likelihood of introduction to at least 'very low'. The restricted risk would then be reduced to at least 'very low', which would achieve the ALOP for Australia.

Recommended measure 3. SO_2/CO_2 fumigation

The Australian Government Department of Agriculture and Water Resources reviewed the efficacy data in support of a combination treatment of SO_2/CO_2 fumigation (listed below) and considered it suitable to manage the risk of *D. vitifoliae*. The treatment is:

- 1 per cent sulphur dioxide (SO_2) and 6 per cent carbon dioxide (CO_2) by volume for 30 minutes, at a pulp temperature of 15.6 degrees Celsius or greater.

Treatment of table grapes with combined SO_2/CO_2 fumigation would reduce the likelihood of introduction of infested fruit to at least 'very low'. The restricted risk would then be reduced to at least 'negligible', which would achieve the ALOP for Australia.

Management for *Guignardia bidwellii*

The Australian Government Department of Agriculture and Water Resources recommends area freedom or a systems approach as measures to reduce the restricted risk for *Guignardia bidwellii* to at least very low, which would achieve the ALOP for Australia.

Recommended measure 1. Area freedom

The requirements for establishing pest free areas or pest free places of production are set out in ISPM 4: *Requirements for the establishment of pest free areas* (FAO 1995) and ISPM 10: *Requirements for the establishment of pest free places of production and pest free production sites* (FAO 1999).

Should Mexico wish to use area freedom as a measure to manage the risk posed by this pathogen, SENASICA would need to provide Australia with a submission demonstrating area freedom for consideration by the Australian Government Department of Agriculture and Water Resources.

If area freedom from this pathogen could be demonstrated for any areas in Sonora, the likelihood of importation of this pathogen with table grapes sourced from those areas would be reduced to at least 'extremely low'. The restricted risks would then be reduced to at least 'very low', which would achieve the ALOP for Australia.

Recommended measure 2. Systems approach

A systems approach that uses the integration of different risk management measures, at least two of which act independently, and which cumulatively achieve the required level of phytosanitary protection could be used to reduce the risk of this pathogen being imported to Australia with consignments of table grapes. More information on a systems approach is set out in ISPM 14: *The use of integrated measures in a systems approach for pest risk management* (FAO 2002).

The Australian Government Department of Agriculture and Water Resources considers a systems approach to address the risk posed by *G. bidwellii* could be based on an area of low pest prevalence, a combination of fruit protection for example fruit bagging, vineyard preventative measures and monitoring, and pest control with post-harvest measures. The approach could be used to progressively reduce the risk of infested table grapes being imported to Australia.

Should Mexico wish to use a systems approach as a measure to manage the risks posed by *G. bidwellii*, SENASICA would need to submit a proposal outlining components of the system and how these components will address the risks posed by this pathogen. The Australian Government Department of Agriculture and Water Resources will consider the effectiveness of any system proposed by SENASICA.

Management for *Cheiracanthium inclusum* and *Latrodectus hesperus*

The spiders *Cheiracanthium inclusum* (yellow sac spider) and *Latrodectus hesperus* (black widow spider) are not plant pests. However, these spiders have been considered to have an unacceptable unrestricted risk to human health and measures are therefore required to manage that risk.

The risk management measures recommended for these pests are a systems approach or fruit treatment (SO_2/CO_2 fumigation) considered to be effective against all life stages of the pests. The objective of these recommended measures is to reduce the risk associated with *C. inclusum* and *L. hesperus* to an acceptable level.

Recommended measure 1. Systems approach

The Australian Government Department of Agriculture and Water Resources considers that a systems approach based on vineyard and packing management and visual inspection is suitable to address the risks posed by yellow sac spider and black widow spider.

Component 1 of systems approach: Vineyard and packing management

Growers must implement a vineyard and packing management regime that will ensure table grapes for export to Australia are free from these pests. Vineyard monitoring must be conducted at a frequency appropriate to the vine growth stage and the life stage of the spiders until the completion of harvest.

Fruit must be packed in a packing house, not in the field, to reduce the likelihood of spiders infesting packaged table grape bunches. Additional security measures may be required to limit contamination by these pests after packing.

Fruit must be inspected for spiders during the harvesting and processing stage. Table grape bunches suspected of being infested with spiders must be examined closely and if any live adults, juvenile spiders or eggs are detected, the fruit must be removed from the export pathway or subjected to remedial action before presentation for pre-export inspection by SENASICA.

Component 2 of systems approach: Visual inspection and, if detected, remedial action

Spiders are external pests and can be detected by trained quarantine inspectors. The Australian Government Department of Agriculture and Water Resources recommends visual inspection and, if detected, remedial action as a second component of a systems approach for these pests. The objective of the recommended visual inspection is to ensure that any consignments of table grapes from Sonora infested with these pests are identified and subjected to appropriate remedial action. Remedial action could include any treatment considered to be effective against the target pests. The remedial action will reduce the risk associated with these spiders to an acceptable level.

Recommended measure 2. SO_2/CO_2 fumigation

The Australian Government Department of Agriculture and Water Resources reviewed the efficacy data in support of a treatment of SO_2/CO_2 fumigation (listed below) and considered it suitable to manage the risk of *C. inclusum* and *L. hesperus*. The treatment is:

- Pre-shipment fumigation with a mixture of 1 per cent sulphur dioxide (SO_2) and 6 per cent carbon dioxide (CO_2) by volume for a minimum of 30 minutes delivered using forced air at a fruit pulp temperature of 15.6 degrees Celsius or greater.
- The chamber load must not exceed 30 per cent.

5.1.2 Consideration of alternative measures

Consistent with the principle of equivalence detailed in ISPM 11: *Pest risk analysis for quarantine pests* (FAO 2013), the Australian Government Department of Agriculture and Water Resources will consider any alternative measure proposed by SENASICA, providing that it manages the target pest to achieve the ALOP for Australia. Evaluation of such measures will require a technical submission from SENASICA that details the proposed measure and includes suitable information to support the efficacy.

5.2 Operational system for the maintenance and verification of phytosanitary status.

A system of operational procedures is necessary to maintain and verify the phytosanitary status of table grapes from Sonora, Mexico. This is to ensure that the recommended risk management measures have been met and are maintained.

5.2.1 A system of traceability to source vineyards

The objectives of this recommended procedure are to ensure that:

- table grapes are sourced only from vineyards producing commercial quality fruit
- vineyards from which table grapes are sourced can be identified so investigation and corrective action can be targeted rather than applying it to all contributing export vineyards in the event that viable quarantine pests are intercepted.

It is recommended that SENASICA establishes a system to enable traceability back to the vineyards where table grapes for export to Australia are sourced from. SENASICA would be responsible for ensuring that export table grape growers are aware of pests of quarantine concern to Australia, and control measures.

5.2.2 Registration of packing house and treatment providers and auditing of procedures

The objectives of this recommended procedure are to ensure that:

- table grapes are sourced only from packing houses and treatment providers processing commercial quality fruit approved by SENASICA for export to Australia
- references to the packing house and the vineyard source (by name or a number code) are clearly stated on cartons destined for export to Australia for trace-back and auditing purposes
- treatment providers are capable of applying a treatment that suitably manages the target pest.

It is recommended that export packing houses and the relevant treatment providers (where applicable) are registered with SENASICA before the commencement of harvest each season. The list of registered packing houses and treatment providers must be kept by SENASICA.

SENASICA would be required to ensure that packing houses and the treatment providers are suitably equipped to carry out the specified phytosanitary activities and treatments. Records of SENASICA audits would be made available to the Australian Government Department of Agriculture and Water Resources upon request.

Where table grapes undergo fruit treatment prior to export, this process could only be undertaken by treatment providers that have been registered with and approved by SENASICA for the purpose.

Approval for treatment providers is subject to availability of suitable equipment and facilities to carry out the treatment.

Where irradiation treatment is used, this process could only be undertaken by treatment providers that have been registered with and audited by SENASICA for the purpose. The Australian Government Department of Agriculture and Water Resources will audit SENASICA management and approval systems.

5.2.3 Packaging and labelling

The objectives of this recommended procedure are to ensure that:

- table grapes proposed for export to Australia, and all associated packaging, is not contaminated by quarantine pests or regulated articles
  - regulated articles are any items other than table grapes. Regulated articles may include plant, plant product, soil and any other organisms, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved
  - in this report, table grapes is defined as table grape bunches or clusters, which include peduncles, rachises, laterals, pedicels and berries (Pratt 1988), but not other plant parts (section 1.2.2)
- unprocessed packing material (which may vector pests identified as not being on the pathway and pests not known to be associated with table grape bunches) is not imported with the table grapes
- all wood material used in packaging of table grapes complies with the Australian Government Department of Agriculture and Water Resources conditions
- secure packaging is used during storage and transport to Australia and must meet Australia's general import conditions for fresh fruits and vegetables, available on the Australian Government Department of Agriculture and Water Resources website
- the packaged table grapes are identifiable for the purposes of trace-back
- the phytosanitary status of table grapes must be clearly identified.

It is recommended that export packing houses and treatment providers (where applicable) ensure packaging and labelling are suitable to maintain phytosanitary status of the export consignments.

SENASICA would be required to ensure all packing houses and treatment providers at the beginning of each export season are suitably equipped to carry out the specified packing and labelling requirements. Records of SENASICA audits would be made available to the Australian Government Department of Agriculture and Water Resources upon request.

5.2.4 Specific conditions for storage and movement

The objective of this recommended procedure is to ensure that:

- the quarantine integrity of the table grapes during storage and movement is maintained.

Table grapes for export to Australia that have been treated and/or inspected must be kept secure and segregated at all times from any fruit for domestic or other markets and untreated/non-certified product, to prevent mixing or cross-contamination

5.2.5 Freedom from trash

All table grapes for export must be free from trash (for example, stem and leaf material, seeds, soil, animal matter/parts or other extraneous material) and foreign matter. Freedom from trash will be verified by the inspection procedures. Export lots or consignments found to contain trash or foreign matter should be withdrawn from export unless approved remedial action is available and applied to the export consignment and then re-inspected.

5.2.6 Pre-export phytosanitary inspection and certification by SENASICA

The objectives of this recommended procedure are to ensure that:

- Australia's import conditions have been met
- all consignments have been inspected 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 phytosanitary certificate or equivalent, 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 traceability information)
  - details of disinfestation treatments (for example methyl bromide fumigation) which includes date, concentration, temperature, duration, and/or attach treatment certificate (as appropriate)

and

- an additional declaration that *'The fruit in this consignment has been produced in Sonora, Mexico, in accordance with the conditions governing entry of fresh table grapes to Australia and inspected and found free of quarantine pests'*.

5.2.7 Verification inspection by the Australian Government Department of Agriculture and Water Resources

The objectives of the recommended requirement for verification are to ensure that:

- all consignments comply with Australian import requirements
- consignments are as described on the phytosanitary certificate and quarantine integrity has been maintained.

To verify that phytosanitary status of consignments of table grapes from Sonora, Mexico, meets Australia's import conditions, it is recommended that the Australian Government Department of Agriculture and Water Resources complete a verification inspection of all consignments of table grapes. It is recommended that the Australian Government Department of Agriculture and Water Resources randomly sample 600 units per phytosanitary certificate.

The detection of any quarantine pest or regulated article for Australia would require suitable remedial action.

5.2.8 Remedial action(s) for non-compliance

The objectives of remedial action(s) for non-compliance are to ensure that:

- any quarantine risk is addressed by remedial action, as appropriate
- non-compliance with import requirements is addressed, as appropriate.

Any consignment that fails to meet Australia's import conditions must be subject to a suitable remedial treatment, if one is available, re-exported from Australia, or destroyed.

Separate to the corrective measures mentioned, there may be other breach actions necessary depending on the specific pest intercepted and the risk management strategy put in place against that pest in the protocol.

If product repeatedly fails inspection, the Australian Government Department of Agriculture and Water Resources reserves the right to suspend the export program and conduct an audit of the risk management systems. The program will recommence only when the Australian Government Department of Agriculture and Water Resources is satisfied that appropriate corrective action has been taken.

5.3 Uncategorised pests

If an organism, including contaminant pests, is detected on table grape bunches either in Sonora, Mexico, or on-arrival in Australia that has not been categorised, it will require assessment by the Australian Government Department of Agriculture and Water Resources to determine its quarantine status and whether phytosanitary action is required. Assessment is also required if the detected species was categorised as not likely to be on the import pathway. The detection of any pests of quarantine concern not already identified in the analysis may result in remedial action and/or temporary suspension of trade while a review is conducted to ensure that existing measures continue to provide the appropriate level of protection for Australia.

5.4 Review of processes

5.4.1 Verification of protocol

Prior to or during the first season of trade, the Australian Government Department of Agriculture and Water Resources will verify the implementation of agreed import conditions and phytosanitary measures including registration, operational procedures and treatment providers, where applicable. This may involve representatives from the Australian Government Department of Agriculture and Water Resources visiting areas in Sonora, Mexico, that produce table grapes for export to Australia.

5.4.2 Review of policy

The Australian Government Department of Agriculture and Water Resources will review the import policy after the first year of trade. In addition, the department reserves the right to review the import policy as deemed necessary, such as when there is reason to believe that the pest or phytosanitary status in Sonora, Mexico, has changed.

SENASICA must inform the Australian Government Department of Agriculture and Water Resources immediately on detection in Sonora, Mexico, of any new pests of table grapes that are of potential quarantine concern to Australia.

5.5 Meeting Australia's food laws

Imported food for human consumption must comply with the requirements of the *Imported Food Control Act 1992*, as well as Australian state and territory food laws. Among other things, these laws require all food, including imported food, to meet the standards set out in the Australia New Zealand Food Standards Code (the Code).

The Australian Government Department of Agriculture and Water Resources administers the *Imported Food Control Act 1992*. This legislation provides for the inspection and control of imported food using a risk-based border inspection program, the Imported Food Inspection Scheme. More information on this inspection scheme, including the testing of imported food, is available from the department's website.

Food Standards Australia New Zealand (FSANZ) is responsible for developing and maintaining the Code, including Standard 1.4.2 – Agvet chemicals. This standard is available on the Federal Register of Legislation or through the FSANZ website.

Standard 1.4.2 and Schedules 20 and 21 of the Code set out the maximum residue limits (MRLs) and extraneous residue limits (ERLs) for agricultural or veterinary chemicals that are permitted in food, including imported food.

Standard 1.1.1 of the Code specifies that a food must not have, as an ingredient or a component, a detectable amount of an Agvet chemical or a metabolite or a degradation product of the Agvet chemical; unless expressly permitted by the Code.

Anyone may apply to change the Code whether they are an individual, organisation or company. The application process, including the explanation of establishment of MRLs in Australia, is described at the FSANZ website.

6 Conclusion

The findings of this final report for a non-regulated analysis of existing policy for table grapes from Sonora, Mexico, are based on a comprehensive scientific analysis of relevant literature.

The Australian Government Department of Agriculture and Water Resources considers that the risk management measures recommended in this report will provide an appropriate level of protection against the pests identified as associated with the trade of table grapes from Sonora, Mexico.

Appendix A Initiation and categorisation for pests of fresh table grapes from Sonora, Mexico

The steps in the initiation and categorisation processes are considered sequentially, with the assessment terminating at 'Yes' for column 3 (except for pests that are present, but under official control and/or pests of regional concern) or the first 'No' for columns 4, 5 or 6.

Details of the method used in this risk analysis are given in Section 2: Method for pest risk analysis.

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, 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.

The department is aware of the recent changes in fungal nomenclature which ended the separate naming of different states of fungi with a pleiomorphic life cycle. However, as the nomenclature for these fungi is in a phase of transition and many priorities of names are still to be resolved, this report uses the generally accepted names and provides alternatively used names as synonyms, where required. As official lists of accepted and rejected fungal names become available, these accepted names will be adopted.

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
ARTHROPODS						
Coleoptera						
Altica torquata Le Conte, 1858 [Chrysomelidae] Flea beetle	Yes (Furth 2005)	No records found	No Larval damage occurs on the foliage of grapevines whilst adult beetles feed primarily on grape buds (Flaherty et al. 1992; Galvan, Burkness & Hutchinson 2013). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Blapstinus sp. Eschscholtz in Mannerheim, 1843 [Tenebrionidae] Darkling ground beetle	Yes (Marcuzzi 1985)	No records found	No This genus damages young vines only on rare occasions by feeding on wounds on the trunk (Flaherty et al. 1992). The larvae live in the soil and feed on the roots of grasses and do not damage grapevine roots (Flaherty et al. 1992). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Carpophilus hemipterus Linnaeus, 1758 [Nitidulidae] Dried fruit beetle	Yes (Olsen 1981)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Cotinis mutabilis (Gory & Percheron, 1833) [Scarabaeidae] Peach beetle	Yes (Maes 2004)	No records found	No Larvae live in the soil. Adults have weak mouthparts and feed on soft fruit or fruit that is already damaged (Faulkner 2006). Adults are large (20 to 34 millimetres) and would be detected if present on a grape bunch during harvest (Faulkner 2006).	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Diabrotica balteata LeConte, 1865 [Chrysomelidae] Banded cucumber beetle	Yes (Capinera 2008; Maes 2004)	No records found	No Although recorded from *Vitis* spp. (Maes 2004), this species prefers plants in the Cucurbitaceae, Rosaceae, Leguminoseae, and Cruciferae families (Capinera 2008). Larvae feed on roots, and adults feed on foliage and flowers (Capinera 2008).	Assessment not required	Assessment not required	No
Fidia viticida Walsh, 1867 [Chrysomelidae] Grape rootworm	Yes (Global Biodiversity Information Facility 2013)	No records found	No Grape rootworm beetles lay eggs under the bark of grapevine trunks. Immature grubs feed on the roots and adults feed on grape foliage. In heavy infestations, the beetles may feed on immature berries in addition to leaves (Dennehy & Clark 1986). No evidence of an association with mature grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Glyptoscelis squamulata Crotch, 1873 [Chrysomelidae] Grape bud beetle	Yes (Andrews & Gilbert 2005)	No records found	No Adult beetles feed on newly opening buds, with feeding damage becoming negligible once shoots reach 26-38 millimetres. *Glyptoscelis squamulata* feed at night, hiding during the day in bark and cracks in wooden stakes. Immature stages are found in the soil and feed on grapevine roots. Eggs are laid under bark or between layers of bark (Flaherty et al. 1992). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Harmonia axyridis Pallas, 1773 [Coccinellidae] Harlequin ladybird	Yes (CABI 2014)	No records found	Yes This species is recorded feeding on grape berries in the US (Kenis et al. 2008; Missouri State University 2005). *Harmonia axyridis* aggregates within grape clusters to feed on damaged berries (Galvan, Burkness & Hutchison 2006; Kovach 2004). In a laboratory test, this species was found able to feed on undamaged grapes, but still prefers to feed on damaged grapes (Kovach 2004).	Yes *Harmonia axyridis* was introduced as a biological control agent of aphids and coccids in Europe, North America, Africa and South America (Brown et al. 2008; Koch, Venette & Hutchison 2006). *Harmonia axyridis* has a wide host range (that is multiple prey species), ability to establish and disperse, and indirect and direct effects on non-target species. In Europe, *H. axyridis* is considered to be an invasive alien species (Brown et al. 2008). Environments with climates similar to these regions exist in various parts of Australia, suggesting that *H. axyridis* has the potential to establish and spread in Australia.	Yes *Harmonia axyridis* are a concern of the wine industry. Due to their noxious odour, even small numbers of beetles inadvertently processed along with grapes can taint the flavour of wine. Tainted wine has reportedly resulted in millions of dollars in losses to the wine industry throughout eastern USA and southern Canada (Galvan, Burkness & Hutchison 2006; Potter, Bessin & Townsend 2005). Recent studies suggest that infestations can cause allergies in some individuals, ranging from eye irritation to asthma which may incur medical costs. *Harmonia axyridis* has also invaded buildings, incurring cleanup and pest control costs (Potter, Bessin & Townsend 2005).	Yes (EP)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Hoplia spp. Illiger, 1803 [Scarabaeidae] Hoplia beetles	Yes (Prokofiev 2014)	No records found	No This species lays eggs in the soil and larvae feed on decaying vegetation and plant roots (Perry 2010). Adults feed on buds, flowers and leaves of a range of plants (Perry 2010), and may feed on grape berry clusters (Bentley et al. 2009; Molinar & Norton 2003). However, they feign death and fall to the ground when disturbed (University of California 2012). Therefore, harvested grape bunches do not provide a pathway for this beetle.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Diptera						
Anastrepha fraterculus (Weidemann, 1830) [Tephritidae] South American fruit fly	Yes (CABI 2014)	No records found	Yes Grapevine is a host of *Anastrepha fraterculus* (CABI 2014) and it has been demonstrated that *A. fraterculus* can complete its life cycle on *V. vinifera* (Zart, Fernandes & Botton 2010).	Yes This species is highly polyphagous with many hosts, including many cultivated plants found throughout Australia such as: citrus, quince, fig, apple, mango, avocado, various stonefruit and grapevine. It is found throughout South and Central America and also up into North America in Mexico and Texas (CABI 2014). Similar climatic conditions to these areas are present in Australia. In addition, *Anastrepha* spp. adults can fly up to 135 kilometres (Fletcher 1989) suggesting their ability to spread.	Yes In Brazil, this is the main pest associated with table grape cultivation. Direct damage to grape berries and other fruit is caused by female oviposition larval feeding. Injury sites can also increase the incidence of fungal infection and bunch rots (Machota et al. 2013).	Yes

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Ceratitis capitata (Wiedemann 1824) [Tephritidae] Mediterranean fruit fly	Yes (CABI 2014)	Yes Present in WA, but under official control	Yes This pest can infest mature table grape bunches (de Lima et al. 2011).	Yes This pest is polyphagous, feeding on the fruit of many plants such as citrus, peach, pear, apple, apricot, fig, plum, kiwifruit, quince, grape, sweet cherry, pomegranate and strawberry (CABI 2014). Mediterranean type climates that favour the establishment of this species occur in various parts of Australia. Adults can fly up to 20 kilometres (Fletcher 1989) allowing them to spread.	Yes A highly damaging pest, particularly in citrus and peach. It can also transmit fruit-rotting fungi. Damage to fruit crops can sometimes reach 100 per cent (CABI 2014).	Yes (EP)
Drosophila melanogaster Meigen, 1830 [Drosophilidae] Common fruit fly	Yes (CABI 2014)	Yes NSW, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Drosophila simulans Sturtevant 1919 [Drosophilidae] Vinegar fly	Yes (CABI 2014)	Yes NSW, Qld (Evenhuis 2007), Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Drosophila suzukii Matsumara, 1931 [Drosophilidae] Spotted wing drosophila	Yes (NAPPO 2011)	No records found	A pest risk assessment for *D. suzukii* will not be conducted in this risk analysis report for table grapes from Sonora, Mexico. There is existing policy for *D. suzukii* for all commodities, including table grapes, from all countries (Department of Agriculture 2013). A summary of pest information and previous assessment is presented in Chapter 4 of this report. Further information on existing policy can be found in the 'Final pest risk analysis report for *Drosophila suzukii*', published on 24 April 2013 (Department of Agriculture 2013).			

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Hemiptera						
Aonidiella orientalis (Newstead, 1894) [Diaspididae] Oriental yellow scale, Oriental scale	Yes (Miller 1998)	Yes Qld, NT, WA (CSIRO 2005; Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Aphis fabae Scopoli, 1763 [Aphididae] Black bean aphid	Yes (CABI 2014)	No records found	No While this species attacks grapevine (Mirica, Mirica & St.Timotei 1987; USDA-APHIS 2002), it rests and feeds on leaves (Miles 1987) and is not associated with fruit (Ingels et al. 1998). No evidence was found of an association with table grape bunches nor an association with grapevines in Mexico.	Assessment not required	Assessment not required	No
Aphis gossypii Glover, 1877 [Aphididae] Cotton aphid	Yes (CABI 2014).	Yes NSW, NT, Qld, SA, Tas., Vic., WA (CSIRO 2005; Plant Health Australia 2001) *Aphis gossypii* is a known vector of Plum pox virus, which is absent from Australia. No records of Plum pox virus were found for Mexico.	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Aphis illinoisensis Shimer, 1866 [Aphididae] Grapevine aphid	Yes (CABI 2014)	No records found	No Prefers young tissues; lives mainly on the lower side of young leaves and on shoots of grapevine (Kamel-Ben Halima & Mdellel 2010). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Aphis spiraecola Patch, 1914 Synonyms: *Aphis citricola* Del Geurcio, 1917 [Aphididae] Spirea aphid, green citrus aphid	Yes (CABI 2001).	Yes NSW, NT, Qld, SA, Tas., Vic., WA (CSIRO 2005; Plant Health Australia 2001) *Aphis spiraecola* is a known vector of Plum pox virus, which is absent from Australia. No records of Plum pox virus were found for Mexico.	Assessment not required	Assessment not required	Assessment not required	No
Aspidiotus destructor Signoret, 1869 [Diaspididae] Coconut scale	Yes (Miller 1998)	Yes NSW, NT, Qld, Vic., WA (Plant Health Australia 2001; Poole 2010)	Assessment not required	Assessment not required	Assessment not required	No
Coccus hesperidum Linnaeus, 1758 [Coccidae] Brown soft scale	Yes (Ben-Dov 2013a; Miller 1998)	Yes ACT, NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Coccus longulus (Douglas, 1887) [Coccidae] Long brown scale	Yes (Miller 1998)	Yes NSW, NT, Qld, SA, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Daktulosphaira vitifoliae (Fitch, 1855) Synonym: *Viteus vitifolii* (Fitch, 1855) [Phylloxeridae] Grapevine phylloxera	Yes (CABI & EPPO 1997c)	Yes Present only in isolated areas of Vic. and NSW. The pest is under official control in these areas and strict quarantine conditions apply (NVHSC 2005; PGIBSA 2009). Not known to be present in WA	Yes The first instar 'crawler' stage is the most dispersive stage and can be found on the soil surface and on the foliage or fruit of vines (Buchanan & Whiting 1991; Powell 2008).	Yes *Daktulosphaira vitifoliae* is already established in small areas of Australia, where it is under official control (NVHSC 2008). In Australia, several generations develop in each growing season (NVHSC 2005). *Daktulosphaira vitifoliae* can be spread by human activities, notably movement of grapevine nursery stock and related products including soil associated with infested roots (for example, carried on footwear or vehicle tyres). Harvesting machinery, other equipment and tools are also implicated with its spread (NVHSC 2005). The potential for spread on harvested table grapes is also a concern (Buchanan & Whiting 1991).	Yes *Daktulosphaira vitifoliae* only causes direct harm to grapevines (*Vitis* spp.). Feeding activity of this insect reduces productivity of vineyards (Granett et al. 2001; Loch & Slack 2007) and infestation renders vineyards uneconomic within 3 to 10 years (Buchanan & Whiting 1991). The only reliable control measure for *D. vitifoliae* is the complete removal of infested vines and their replacement with grapevines grown on resistant rootstock (Buchanan & Whiting 1991).	Yes (EP)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Diaspis boisduvalii Signoret, 1869 [Diaspididae] Boisduval scale	Yes (Miller 1998)	Yes NSW, Qld, SA, Tas. (Plant Health Australia 2001). Not known to be present in WA	No Miller and Davidson (2005) examined specimens from *Vitis* but they do not state which *Vitis* species or plant part. This is only an important pest on orchids. It may settle on any aerial part of a plant, but there is a preference for leaves. It is not considered to be a pest in Mexico (Miller & Davidson 2005). No evidence of an association with table grape bunches was found.	Assessment not required	Assessment not required	No
Draeculacephala minerva Ball 1927 [Cicadellidae] Green sharpshooter	Yes (Wilson, Turner & McKamey 2009)	No records found	No Feeds on pastures, *Vitis vinifera* is only an occasional host (Bentley et al. 2009; Cabrera-La Rosa et al. 2008; Purcell & Frazier 1985). Given the large size and mobility of sharpshooter species, they are easily detected and disturbed during harvest and packing house operations and are not likely to be associated with the pathway. However, because this species can vector *Xylella fastidiosa*, the causal agent of Pierce's disease and a quarantine pest of significant concern to Australia, visual inspection and remedial action will be required to manage the risk of this species for table grapes from Sonora, Mexico. This is consistent with Australia's existing policy for *Homalodisca vitripennis* for table grapes from California.			
Erythroneura elegantula Osborn, 1928 [Cicadellidae] Western grape leafhopper	Yes (González et al. 1988)	No records found	No Leafhopper feeding and oviposition occurs on leaves (Bentley et al. 2009; Paxton & Thorvilson 1996). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Erythroneura variabilis Beamer, 1929 [Cicadellidae] Variegated leafhopper	Yes (González et al. 1988)	No records found	No Leafhopper feeding and oviposition occurs on leaves (Bentley et al. 2009; Paxton & Thorvilson 1996). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Erythroneura ziczac Walsh, 1862 [Cicadellidae] Virginia creeper leafhopper	Yes (González et al. 1988)	No records found	No Leafhopper feeding and oviposition occurs on leaves (Bentley et al. 2009; Paxton & Thorvilson 1996). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Ferrisia virgata Cockerell 1893 [Pseudococcidae] Striped mealy bug	Yes (Miller 1998)	Yes NSW, NT, Qld, WA (Ben-Dov 1994; CSIRO 2005; Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Graphocephala atropunctata (Signoret, 1854) [Cicadellidae] Blue-green sharpshooter	Yes (Wilson, Turner & McKamey 2009)	No records found	No This pest is most abundant in riparian habitats in association with weeds, shrubs and trees (Redak et al. 2004). Sharpshooters feed on the succulent new growth of shoots, not fruit (Redak et al. 2004). Given the large size and mobility of sharpshooter species, they are easily detected and disturbed during harvest and packing house operations. However, because this species can vector *Xylella fastidiosa*, the causal agent of Pierce's disease and a quarantine pest of significant concern to Australia, visual inspection and remedial action will be required to manage the risk of this species for table grapes from Sonora, Mexico. This is consistent with Australia's existing policy for *Homalodisca vitripennis* for table grapes from California.			

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Hemiberlesia lataniae Signoret 1869 Synonym: *Aspidiotus lataniae* Signoret 1869 [Diaspididae] Latania scale	Yes (Miller 1998)	Yes NSW, NT, Qld, Vic., WA (CSIRO 2005; Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Hemiberlesia rapax (Comstock, 1881) [Diaspididae] Greedy scale	Yes (Miller 1998)	Yes NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Homalodisca vitripennis Germar, 1821 Synonym: *Homalodisca coagulata* Say 1832 [Cicadellidae] Glassy-winged sharpshooter	Yes (Hoddle 2004)	No records found	A pest risk assessment for *Homalodisca vitripennis* will not be conducted in this risk analysis report for table grapes from Sonora, Mexico. Reviews of policy for Californian table grapes, undertaken since those imports commenced in 2002, have concluded that commercially picked and packed table grapes are not a pathway for this pest (Biosecurity Australia 2003, 2006a). However, because this species can vector *Xylella fastidiosa*, the causal agent of Pierce's disease and a quarantine pest of significant concern to Australia, visual inspection and remedial action are still required to manage the risk on Californian table grapes. The same policy will be adopted for *H. vitripennis* for table grapes from Sonora, Mexico.			
Icerya purchasi (Maskell, 1876) [Monophlebidae] Cottony cushion scale	Yes (Ben-Dov, Miller & Gibson 2012)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Lygus hesperus Knight, 1917 [Miridae] Western plant bug	Yes (Machain 1973)	No records found	Yes *Lygus hesperus* feeds on leaf and flower buds, flowers, fruits and seeds (PHA 2013; Rosenheim, Goeriz & Thacher 2004; Scott 1977). *Lygus* bugs are recorded as pests of grapes in Colorado, USA (Hamman, Savage & Larsen 1998).	Yes *Lygus hesperus* is highly polyphagous and has been reported from over 100 plant species in 24 families (Scott 1977). It is found in California, the Pacific Northwest, arid southwest of the USA (Naranjo & Stefanek 2012; Seymour et al. 2005) and Mexico (Machain 1973). Its polyphagy and current geographic distribution suggest that it could establish and spread in similar parts of Australia.	Yes This is an important pest of fruit, vegetable, fibre, tree and seed crops in North America (Day, Baird & Shaw 2012) and the most important pest of the alfalfa seed industry in California and the Pacific Northwest. Applications of insecticides to control this pest impacts on beneficial insects such as bees, reducing crop yields even further. Insecticide resistant populations of *Lygus* species have also been reported (Seymour et al. 2005). Crop losses attributed to *Lygus* species have often been estimated in the millions of dollars (Mueller 2003).	Yes (EP)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Lygus lineolaris (Palisot, 1818) [Miridiae] Tarnished plant bug	Yes (Machain 1973)	No records found	Yes Associated with grapes (Fleury et al. 2006; Jubb, Masteller & Wheeler 1979). It feeds on all aerial plant parts, but favours leaf and flower buds, flowers, fruits and seeds (CABI 2014).	Yes Highly polyphagous and attacks a wide range of economic hosts including herbaceous plants, vegetable crops, cut flower crops, fruit trees and nursery stock (Dixon 2009). More than half of the cultivated plant species in the USA are reported as hosts for *L. lineolaris* (Dixon 2009). It is found throughout North America in climates which share similarities to that of Australia. This, and its wide host range (385 plant species), small size, and relatively quick reproductive cycle (Dixon 1989) would facilitate its ability to establish and spread in Australia.	Yes Damage has been reported on apples, strawberries and peaches, with fruits developing 'catfacing' injuries around feeding sites. Fruit development can also be affected (CABI 2014) In New York State, 67 per cent fruit damage, and a 30 per cent reduction in berry weight, was observed in strawberry (CABI 2014). It has developed insecticide resistance to all traditional classes of insecticides, including organophosphates, pyrethroids and cyclodines in Arkansas and Mississippi, USA (Lorenz et al. 2000).	Yes (EP)
Maconellicoccus hirsutus (Green, 1908) [Pseudococcidae] Pink hibiscus mealybug, grape mealybug	Yes (EPPO 2005)	Yes NT, Qld, SA, Vic., WA (CSIRO 2005; Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Macrosiphum euphorbiae Thomas, 1878 [Aphididae] Potato aphid	Yes (Mora-Aguilera et al. 1993)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (CSIRO 2005; Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Murgantia histrionica (Hahn, 1834) [Pentatomidae] Harlequin bug	Yes (Barrios-Díaz et al. 2004)	No records found	No Feeds and breeds on crucifers, but a historic reference states that it attacks the fruit of grapes (Chittenden 1908). No contemporary report of association with grape bunches was found. Eggs are laid on the underside of leaves, nymphs remain atop or near the eggs and the adults are large (8 to 11.5 millimetres) and colourful (CABI 2014) and therefore easily seen.	Assessment not required	Assessment not required	No
Myzus persicae (Sulzer, 1776) [Aphididae] Green peach aphid	Yes (CABI 2014)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Nysius raphanus Howard, 1872 [Lygaeidae] False chinch bug	Yes (Schaefer & Panazzi 2000)	No records found	No A pest of cruciferous weeds (Bentley et al. 2009) in Europe and the US. However, population pressures can cause the nymphs and adults to migrate from their weedy hosts to grapevine in search of new green growth (Bentley et al. 2009; Flaherty et al. 1992). This is associated with undercutting of weeds in and around vineyards when vines are leafing out (Barnes 1970). Does not prefer grapevine as a host and is only associated with grapevine leaves (Bentley, Varela & Daane 2005). Eggs are also laid in the soil (Flaherty et al. 1992). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Parasaissetia nigra Nietner, 1861 [Coccidae] Pomegranate scale	Yes (Miller 1998)	Yes NSW, NT, Qld, Vic., WA (CSIRO 2005; Plant Health Australia 2001), SA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Parthenolecanium corni Bouché, 1844 [Coccidae] European fruit lecanium	Yes (Ben-Dov 2013a)	Yes Tas., Vic., (CSIRO 2005; Plant Health Australia 2001; Snare 2006) Not known to be present in WA	Yes This species sucks sap from branches, leaves and fruit of grapevines (Zhang 2005). Due to their small size and habit of feeding in concealed areas on plant material and fruit, they are frequent invasive species (Miller et al. 2007).	Yes This pest is widely distributed in temperate and subtropical regions (Ben-Dov 2012a). This pest is highly polyphagous, attacking some 350 plant species placed in 40 families (Ben-Dov 2012a). Many of these host plants are available in Western Australia.	Yes It has been observed to cause heavy infestation and damage to *Vitis vinifera* in the Kashmir Valley (Bhagat, Ramzan & Farhan 1991) and is the most widespread and injurious soft scale in French vineyards (Sforza, Boudon-Padieu & Greif 2003). Trees infested with *P. lecanium* lose leaves and decrease their annual growth while heavy infestations lead to fungal growth on the honeydew secretions (David'yan 2008). This species also transmits viruses (Ben-Dov 2012a).	Yes (EP, WA)
Parthenolecanium persicae (Fabricius, 1776) [Coccidae] Peach scale	Yes (Ben-Dov 2013a)	Yes ACT, NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Parthenolecanium pruinosum (Coquillett, 1891) [Coccidae] Frosted scale	Yes (Ben-Dov 2013a)	Yes NSW, SA, Tas., Vic., WA (Poole & Hammond 2011b)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Planococcus ficus (Signoret, 1875) [Pseudococcidae] Grapevine mealybug	Yes (Ben-Dov 2013b)	No records found	Yes Mealybugs occupy the main stems of the vines, but move to the new growth areas, such as leaves and grape bunches as the season progresses (Walton & Pringle 2004a). They have been known to accumulate in grape clusters (Millar et al. 2002).	Yes The grapevine mealybug can have up to four to six generations per year (Millar et al. 2002) and is very polyphagous, causing damage to plants in over 11 families (Ben-Dov 2012b). The grapevine mealybug occurs in many countries including Argentina, Brazil, Egypt, France, Mexico, Russia, South Africa and United States of America (Ben-Dov 2012b). Environments with climates similar to these regions exist in various parts of Australia, suggesting that *P. ficus* has the potential to establish and spread in Australia.	Yes *Planococcus ficus* is a key pest in vineyards worldwide (Ben-Dov 2012b; Millar et al. 2002; Walton & Pringle 2004b). This pest has the ability to destroy a grape crop and cause progressive weakening of vines through early leaf loss (Walton et al. 2006; Walton & Pringle 2004b). In the last decade, economic losses from this pest in Californian vineyards have increased dramatically (Millar et al. 2002). The pest is also a major transmitter of numerous viruses and diseases (Millar et al. 2002; Walton & Pringle 2004a). It also excretes large amounts of honeydew on grapes (Walton & Pringle 2004b).	Yes (EP)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Planococcus minor (Maskell, 1897) [Pseudococcidae] Pacific mealybug	Yes (Miller 1998)	Yes ACT, NSW, NT, Qld, SA (Plant Health Australia 2001) Not known to be present in WA	Yes A pest of grapes (USDA 2007). *Planococcus* are known to feed on grape bunches (Yadav & Amala 2013).	Yes *Planococcus minor* is polyphagous attacking many wild and cultivated susceptible species; 250 host species in nearly 80 families are reported as hosts (Ben-Dov 2012b; Lit, Caasi-Lit & Calilung 1998; Sugimoto 1994; Venette & Davis 2004). Susceptible hosts are freely available in Western Australia, suggesting a high possibility that a suitable host would be found. Many species of mealybugs are considered invasive, rapidly becoming established when introduced into new areas (Miller, Miller & Watson 2002). This species is already present in the eastern states and territories of Australia. The current distribution and host range of this insect suggests that it could establish and spread in Western Australia.	Yes *Planococcus minor* is a pest of many economically important species (Ben-Dov 2012b; Venette & Davis 2004). It has potential to cause economic damage if introduced into Western Australia.	Yes (EP, WA)

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Pseudococcus calceolariae Maskell, 1879 [Pseudococcidae] Citrophilus mealybug	Yes (Miller 1998)	Yes Qld, NSW, Vic., Tas., SA (CSIRO 2005; Plant Health Australia 2001) No records found for WA. However, WA does not require mitigation measures for this pest for other hosts (such as stonefruit) from Australian states where this pest is present (DAFWA 2014; Poole et al. 2011). This is also reinforced in the Pest Policy Review for Fresh table grape bunches (*Vitis* spp.) imported into Western Australia from other states and territories (DAFWA 2015d).	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Pseudococcus comstocki (Kuwana, 1902) [Pseudococcidae] Comstock mealybug	Yes (Miller 1998)	No records found	Yes Found on grapevine (Kaydan & Kozár 2010). When searching for sheltered places females of this species may infest fruits (Ben-Dov 2013b). Mealybugs associated with grapevine are known to infest grape bunches (Furness & Charles 1994).	Yes Over 300 possible host plant species are reported including several agricultural crops (such as banana, peach, pears, lemon, apricot, cherry, grapes and mulberry) in Asia and Europe (Ben-Dov 2013b; CABI 2014). Widely distributed across the world, except Africa, (Ben-Dov 2013b) indicating it has the potential to establish and spread in Australia.	Yes *Pseudococcus comstocki* is known to damage several agricultural crops such as banana, peach, pears, lemon, apricot, cherry, grapes and mulberry (CABI 2014).	Yes (EP)
Pseudococcus jackbeardsleyi Gimpel and Miller, 1996 [Pseudococcidae] Jack Beardsley mealybug	Yes (Ben-Dov 2013b)	No Although detected in the Torres Strait Islands in 2010 and at Weipa in 2013, there are quarantine measures in place to prevent its further spread on mainland Australia (Australian Government Department of Agriculture 2014).	Yes Reported to be associated with grapevine (Ben-Dov 2013b; CABI 2014). Mealybugs associated with grapevine are known to infest grape bunches (Furness & Charles 1994).	Yes Currently distributed through Asia, North, Central and South America and the Pacific. It is highly polyphagous and recorded on over 70 genera including Acacia, Ananas, Annona, Apium, Capsicum, Citrus, Cucumis, Cucurbita, Gossypium, Mangifera, Musa, Solanum and Vitis (CABI 2014). The current host range and distribution suggest that it could establish and spread in Australia.	Yes Listed as a quarantine pest by Korea. Establishment in Australia could affect market access to Korea. Specific reports of economic damage were not found, but the highly polyphagous nature of this pest and its record of spread suggest that it could become a significant pest (CABI 2014).	Yes (EP)

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Pseudococcus longispinus (Targioni Tozzetti, 1867) [Pseudococcidae] Long-tailed mealybug	Yes (Miller 1998).	Yes ACT, NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Pseudococcus maritimus (Ehrhorn, 1900) [Pseudococcidae] American grape mealybug	Yes (Ben-Dov 2013b)	No records found	Yes Early stages damage the young roots of grapevines before moving up onto the vine to damage shoots, stems and fruit (Zhang 2005).	Yes The potential for *P. martimus* to become established and spread in new areas is reflected by its wide host range, which includes cultivated and ornamental plants from 44 families (Ben-Dov 2013b). Most of the listed hosts occur throughout Australia. Climatic conditions in Australia may be suitable for its establishment and spread.	Yes Mealybugs feed on sap, stressing their host plants and reducing yield of commercial crops. Production of honeydew also promotes growth of sooty moulds, which reduce the marketability of fruit (CABI 2014).	Yes (EP)
Pseudococcus viburni (Signoret, 1875) [Pseudococcidae] Obscure mealybug	Yes (Miller 1998)	Yes NSW, Qld, SA, Tas., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Rhizoecus falcifer Kunckel d'Herculais, 1878 [Rhizoecidae] Ground mealybug	Yes (Ben-Dov, Miller & Denno 2014)	Yes NSW, Qld, SA (Plant Health Australia 2001) Not known to be present in WA	No The ground mealybug lives its life entirely subterranean, feeding on plant roots (Flaherty et al. 1992). It has an occasional association with home or backyard grapevine plantings, but not with commercial vineyards (Flaherty et al. 1992).	Assessment not required	Assessment not required	No

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Saissetia coffeae Walker, 1852 [Coccidae] Hemispherical scale	Yes (Ben-Dov 2013a)	Yes ACT, NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Saissetia oleae (Olivier, 1791) [Coccidae] Black scale	Yes (Miller 1998)	Yes ACT, NSW, Qld, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Scaphoideus titanus Ball, 1932 Synonym: *Scaphoideus littoralis* Ball, 1932 [Cicadellidae]	Yes (Munyaneza et al. 2009)	No records found	No All life stages of this pest have been collected on grapevine in the USA (Maixner et al. 1993). However, the eggs are found under the bark; adults and fourth and fifth instar nymphs can feed on green shoots and stems (Lessio & Alma 2006). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Spissistilus festinus Say, 1830 [Membracidae] Three-cornered alfalfa hopper	Yes (Stewart, McClure & Patrick 2014)	No records found	No Feeds on the branches, leaves and stems of grapevine (Flaherty et al. 1992). Eggs are deposited on young tender shoots early in spring (Flaherty et al. 1992).	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Stictocephala bisonia Kopp & Yonke, 1977 Synonym: *Ceresa alta* Walker, 1851 [Membracidae] Buffalo treehopper	Yes (CABI 2014)	No records found	No Eggs are laid in twigs on lower branches, nymphs fall to the ground after hatching to feed on succulent plants and adults feed on woody plants (CABI 2014). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Lepidoptera						
Desmia funeralis Hübner, 1796 [Pyralidae] Grape leaffolder	Yes (Flaherty et al. 1992)	No records found	No Eggs are laid on leaves, larvae feed on leaves and pupae hide themselves in leaf folds. Only when population levels are high, and severe defoliation has occurred, will larvae move into grape bunches to feed. Affected fruit is not suitable for sale as fresh fruit and may be diverted for distilling. This pest also prefers native American grapes to *V. vinifera* varieties (Flaherty et al. 1992).	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Estigmene acrea (Drury, 1773) [Arctiidae] Salt marsh moth	Yes (Young & Sifuentes 1960)	No records found	No Eggs are laid on leaves and larvae feed on leaves. The caterpillars grow to over 5 centimetres and are covered in woolly hairs and hence are easily seen. The pupae are also large, about 2.5 centimetres long. Pupae are usually found on the soil, but some may be found in the grape bunches. However, these will not enter the pathway as the pupae are large and easily seen, and the presence of pupae in the bunch makes it unsalable (Flaherty et al. 1992).	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Eumorpha achemon Drury, 1773 [Sphingidae] Sphinx moth	Yes (Global Biodiversity Information Facility 2013)	No records found	No Larvae primarily attack the foliage of grapevines, including wild grapevines (Bentley, Varela & Daane 2005; Flaherty et al. 1992). Eggs are usually deposited on the upper surface of older leaves (Flaherty et al. 1992). After hatching, caterpillars feed on the leaves and then migrate to the ground (Flaherty et al. 1992). Adults can be as large as a hummingbird with a wing expanse up to 10 centimetres (Flaherty et al. 1992). Given their large size, adults of *E. achemon* are unlikely to be associated with grape bunches for export. No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Eumorpha vitis Linnaeus, 1758 [Sphingidae] Grapevine sphinx moth	Yes (Global Biodiversity Information Facility 2013)	No records found	No The assessment for *E. achemon* has been used for this species as no information could be found describing this species' association with the table grape pathway.	Assessment not required	Assessment not required	No

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Harrisina americana Guérin-Meneville, 1829 [Zygaenidae] Western grapeleaf skeletoniser	Yes (Global Biodiversity Information Facility 2013)	No records found	No Eggs are laid on leaves and larvae feed on leaves (Bentley et al. 2009). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Harrisina brillians Barnes and McDunnough, 1910 [Zygaenidae] Western grapeleaf skeletoniser	Yes (Guerra-Sobrevilla 1991)	No records found	No Eggs are laid on leaves and pupae are found on the ground or under loose bark (Flaherty et al. 1992). Larvae feed on leaves, but in cases of high population levels and severe defoliation, fourth and fifth instar larvae may feed on berries (Flaherty et al. 1992). If this occurs, the fruit will not be picked and packed for export because they will be of low quality and have feeding damage and rots.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Hyles lineata Fabricius, 1775 [Sphingidae] White lined sphinx moth	Yes (Global Biodiversity Information Facility 2013; Robinson et al. 2010)	Yes WA (Plant Health Australia 2001)	No The larvae primarily attack foliage and are only an occasional pest on grapevines (Flaherty et al. 1992). It is most often found on weeds and herbaceous plants (Hyche 2001). Both pupae and adults are large and would be detected during harvest procedures. Caterpillars feed on grape leaves and migrate to the ground after about 25 days of feeding (Flaherty et al. 1992).	Assessment not required	Assessment not required	No
Hyphantria cunea Drury, 1770 [Arctiidae] Fall webworm	Yes (Warren & Tadic 1970)	No records found	No Found on grapevine (CABI 2014), but not a preferred host (Warren & Tadic 1970). Eggs are laid on leaves and larvae feed on leaves. Larvae are gregarious, spin silken nests and are large (up to 35 millimetres) and are therefore easily seen. Adults usually rest on the underside of leaves, trunks or branches and are also easily seen as they are white (Warren & Tadic 1970). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

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Marmara gulosa Guillén and Davis, 2001 [Gracillariidae] Citrus peelminer	Yes (Kirkland 2009)	No records found	Yes Is known to be associated with the stem, petiole, tendril, bunch rachis and berry of grapes (Eichlin & Kinnee 2001).	Yes Reported from California, Arizona, Texas, Florida, Mexico and Cuba (Eichlin & Kinnee 2001; Kirkland 2009; Stelinski 2007). The climatic conditions in its known range are similar to parts of Australia. That, and its wide host range across species of commercial fruit crops, ornamentals and weeds (Eichlin & Kinnee 2001) would allow it to establish and spread in Australia.	Yes Infestations have resulted in considerable economic losses to its host, such as citrus (Kirkland 2009). In grapes, mining damage can also lead to secondary infections, such as bunch rot (Kirkland 2009).	Yes (EP)
Peridroma saucia (Hübner, 1808) [Noctuidae] Pearly underwing moth	Yes (CABI 2014)	No records found	No Larvae feed on buds of grapevines (Bentley et al. 2009; MAF Biosecurity New Zealand 2009). Larvae move to the soil or under bark during the day (Bentley et al. 2009) and adults are inactive during the day, remaining under foliage or at the base of the plant (Mau & Martin Kessing 2007). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

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Platynota stultana Walsingham, 1884 [Tortricidae] Omnivorous leafroller	Yes (CABI 2014)	No records found	Yes Larvae feed on grape berries (Bentley & Coviello 2012).	Yes Polyphagous species feeding on many common fruit, vegetable and fibre crops as well as *Eucalyptus* spp. and clover (CABI 2014). Is likely to find suitable hosts and climatic conditions in Australia.	Yes Allows secondary rots to infect grape bunches due to direct feeding damage on berries (Bentley & Coviello 2012; CABI 2014).	Yes (EP)
Plodia interpunctella Hübner, 1813 [Pyralidae] Indian meal moth	Yes (CABI 2014)	Yes ACT, NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Spodoptera exigua Hübner, 1803 [Noctuidae] Beet armyworm	Yes (CABI 1972)	Yes ACT, NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Spodoptera frugiperda Smith & Abbot, 1797 [Noctuidae] Fall armyworm	Yes (Cortez-Mondaca, Armenta-Cárdenas & Bahena-Juárez 2010)	No records found	No Grapevines are only occasionally attacked. This pest's preferred hosts are grasses (Capinera 2005). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

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Orthoptera						
Schistocerca shoshone (Thomas, 1873) [Acrididae] Green valley grasshopper	Yes (Global Biodiversity Information Facility 2013)	No records found	No Eggs are laid in the soil and following egg hatch, nymphs feed on natural vegetation (Flaherty et al. 1992). Adults can migrate into the vineyard and feed on young foliage of young shoots (Flaherty et al. 1992). *Schistocerca shoshone* is large and highly mobile. It is likely that harvest procedures would detect or disturb this pest.	Assessment not required	Assessment not required	No
Schistocerca nitens Thunberg, 1815 [Acrididae] Vagrant grasshopper	Yes (CABI 2014)	No records found	No Eggs are laid in the soil and following egg hatch, nymphs feed on natural vegetation (Flaherty et al. 1992). Adults can migrate into the vineyard and feed on young foliage of young shoots (Flaherty et al. 1992). *Schistocerca nitens* is large and highly mobile. It is likely that harvest procedures would detect or disturb this pest.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Trombidiformes						
Brevipalpus californicus (Banks, 1904) Synonym: *Brevipalpus australis* Baker, 1949 [Tenuipalpidae] Citrus flat mite	Yes (Jeppson, Keifer & Baker 1975)	Yes NSW, NT, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Brevipalpus lewisi McGregor, 1949 [Tenuipalpidae] Grape bunch mite	Yes (CABI 2010)	Yes NSW, SA, Vic. (Plant Health Australia 2001), WA (Poole 2008)	Assessment not required	Assessment not required	Assessment not required	No
Brevipalpus obovatus Donnadieu, 1875 [Tenuipalpidae] Scarlet tea mite	Yes (CABI 1988)	Yes NSW, Vic., WA (Plant Health Australia 2001), Qld. (CSIRO 2005)	Assessment not required	Assessment not required	Assessment not required	No
Brevipalpus phoenicis (Geijskes, 1939) [Tenuipalpidae] Red and black flat mite	Yes (Denmark & Fasulo 2009)	Yes NSW, NT (CSIRO 2005; Plant Health Australia 2001), Qld, SA, WA (CSIRO 2005)	Assessment not required	Assessment not required	Assessment not required	No
Eotetranychus carpini (Oudemans, 1905) [Tetranychidae] Hornbeam spider mite	Yes (Migeon & Dorkeld 2013)	No records found	No Lives predominantly on leaves, feeds on shoots and leaves and overwinters under the bark (INRA 1997). No evidence of an association with grape bunces was found.	Assessment not required	Assessment not required	No

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Oligonychus punicae (Hirst, 1926) [Tetranychidae] Avocado brown mite	Yes (Tuttle, Baker & Abbatiello 1976)	No records found	No They are associated with leaves of grapevine (Vasquez et al. 2008). No evidence of an association with table grape bunches was found.	Assessment not required	Assessment not required	No
Oligonychus yothersi (McGregor, 1914) [Tetranychidae] Avocado red mite	Yes (Migeon & Dorkeld 2006b)	No records found	No Feeds on grapevine leaves. During heavy infestations, the entire leaf surface may be attacked (Jeppson, Keifer & Baker 1975). No evidence of an association with table grape bunches was found.	Assessment not required	Assessment not required	No
Panonychus citri (McGregor, 1916) [Tetranychidae] Citrus red mite	Yes (Migeon & Dorkeld 2006b)	Yes NSW (only in greater Sydney area and under official control) (Plant Health Australia 2009), SA (CSIRO 2005) Not known to be present in WA	No Though this species attacks grapevine (Migeon & Dorkeld 2012; Wu & Lo 1989), feeding occurs on leaves (Jeppson, Keifer & Baker 1975). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Polyphagotarsonemus latus Banks, 1904 [Tarsonemidae] Broad mite	Yes (de Coss et al. 2010)	Yes NSW, NT, SA, Vic., WA (Plant Health Australia 2009)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Tetranychus kanzawai Kishida, 1927 [Tetranychidae] Kanzawa spider mite	Yes (CABI 1998).	Yes NSW (Gutierrez & Schicha 1983), NT (Flechtmann & Knihinicki 2002), Qld (CSIRO 2005; Gutierrez & Schicha 1983) Not known to be present in WA	Yes *Tetranychus kanzawai* mites and webbing are often found on the under surfaces of the leaves, but can occasionally attack and breed on grape berries (Ashihara 1996; CABI 2012; Ho & Chen 1994).	Yes Major hosts are groundnut, tea, pawpaw, citrus, soybean, peach, apple, cherry, aubergine, watermelon and grapevine (CABI 2012; Migeon & Dorkeld 2012; Moon et al. 2008), which are present in Western Australia. This species is recorded from China, Greece, India, Japan, Korea and Mexico (Migeon & Dorkeld 2006a). It has also been introduced to, and has successfully established in, Queensland and NSW (Gutierrez & Schicha 1983). Environments with climates similar to these regions exist in various parts of Western Australia, suggesting that *T. kanzawai* has the potential to establish and spread in WA.	Yes *Tetranychus kanzawai* is a significant polyphagous pest subject to quarantine measures in many parts of the world (Navajas et al. 2001).	Yes (EP, WA)
Tetranychus mexicanus (McGregor, 1950) [Tetranychidae]	Yes (Mendonça et al. 2011)	No records found	No Only reported to occur on the leaves of grapevine (Andrade-Bertolo et al. 2013). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

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Tetranychus pacificus McGregor, 1919 [Tetranychidae] Pacific mite	Yes (CABI 2014)	No records found	No Only occurs on leaves (Flaherty et al. 1992). Mitcham *et al.* (1997) state that adults, larvae and protonymphs could be present on harvested grape bunches and cite Flaherty *et al.* (1992) as the authority, but Flaherty *et al.* (1992) does not make this statement. No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Tetranychus urticae Koch, 1836 Synonym: *Tetranychus cinnabarinus* (Boisduval, 1867) [Tetranychidae] Two spotted spider mite	Yes (CABI 2014)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

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Thysanoptera						
Caliothrips fasciatus (Pergande, 1895) [Thripidae] Bean thrips	Yes (Hoddle, Stosic & Mound 2006)	No records found	Yes This species is known to be associated with grapevine (Flaherty et al. 1992; Hoddle, Stosic & Mound 2006). Thrips are highly thigmotactic and cryptic (Hoddle, Stosic & Mound 2006). The cryptic and thigmotactic behaviour of thrips and this species' association with grapevine indicates it may be present in grape bunches.	Yes *Caliothrips fasciatus* is native to North America and is distributed across the United States and western Mexico (Hoddle, Stosic & Mound 2006). Environments with climates similar to these regions exist in Australia. That, and its highly polyphagous nature (Hoddle, Stosic & Mound 2006) suggest that *C. fasciatus* has the potential to establish and spread in Australia.	Yes It is a pest of quarantine concern that currently only occurs in North America. Establishment in Australia could affect export conditions for Australian produce to other countries (Hoddle, Stosic & Mound 2006).	Yes (EP)

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Drepanothrips reuteri Uzel, 1985 [Thripidae] Grape thrips	Yes (SAGARPA 2005)	No records found	Yes Table grapes are susceptible to thrips damage. This thrips causes severe damage to both foliage and grape bunches, scarring berries with their feeding (Flaherty et al. 1992).	Yes. *Drepanothrips reuteri* feeds on *Vitis* spp. and can survive on deciduous trees such as oak (Mound & Palmer 1981). These hosts are available in Australia. This species also has a high reproductive rate (Mound & Teulon 1995). This species is recorded from Japan, England, France, Italy, Greece, Chile and the USA (Mound & Palmer 1981). Environments with climates similar to these regions exist in various parts of Australia, suggesting that *D. reuteri* has the potential to establish and spread in Australia.	Yes Damages plants directly by feeding and laying eggs, and indirectly as a virus vector (Mound & Teulon 1995).	Yes (EP)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Frankliniella occidentalis (Pergande, 1895) [Thripidae] Western flower thrips	Yes (Nakahara 1997)	Yes ACT, NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001) Absent from NT (DRDPIFR NT 2008) and domestic restrictions are in place.	Yes This species feeds on leaves, stems, flowers and fruit of grapevine (Childers 1997; Flaherty et al. 1992; Kirk & Terry 2003; Kulkarni, Mani & Banerjee 2007; USDA-APHIS 2002).	Yes This thrips has a wide host range, including chrysanthemums, cucurbits, cotton, grapes, citrus and apple (CABI 2012). *Frankiniella occidentalis* is distributed globally (CABI 2014; Jones 2005; Kirk & Terry 2003) and has successfully spread across most of Australia (Plant Health Australia 2001), indicating that suitable environments exist in NT for this thrips to establish.	Yes This is a major pest causing direct damage through feeding and oviposition injury as well as via transmission of at least five tospoviruses. Feeds on leaves and flowers (CABI 2014; Davidson, Butler & Teulon 2006; Jones 2005; Stavisky et al. 2002).	Yes (EP, NT)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Scirtothrips citri (Moulton, 1909) [Thripidae] Californian citrus thrips	Yes (CABI & EPPO 1997b)	No records found	No It is associated with grapevine, but grapevine is not a breeding host (CABI 2014). Records of *S. citri* on grapevine appear to be limited to the southern part of North America where it is considered to be a minor pest of grapevine (Cline 1986). This thrips seems to require access to soft green tissue (except for pupation), so only seedlings or cuttings are likely to carry the pest. Only young fruit are attacked. There is no direct evidence that this species has been spread beyond its native range by human activity (CABI & EPPO 1997b). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Thrips hawaiiensis Morgan, 1913 [Thripidae] Hawaiian flower thrips	Yes (Nakahara 1994; Palmer & Wetton 1987)	Yes NSW, NT, Qld, SA, Vic., WA (Plant Health Australia 2001; Poole 2008, 2010)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
BACTERIA						
Pseudomonas syringae pv. *syringae* van Hall 1902 [Pseudomonadales: Pseudomonadaceae] Bacterial canker	Yes (CABI 2014)	Yes NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Rhizobium radiobacter (Beijerinck & van Delden, 1902) Young *et al.*, 2001 Synonym: *Agrobacterium tumefaciens* (Smith and Townsend, 1907) Conn, 1942 [Rhizobiales: Rhizobiaceae] Crown gall	Yes (Bradbury 1986; CABI 2014)	Yes NSW, Qld, SA, Tas., Vic. (Bradbury 1986; Plant Health Australia 2001), WA (Shivas 1989)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Xylella fastidiosa Wells *et al.*, 1987 [Xanthomonadales: Xanthomonadaceae] Pierce's disease	Yes (CABI 2014)	No records found	Yes It spreads systemically through xylem vessels and can be present where ever these tissues occur (Pearson & Goheen 1988).	No *Xylella fastidiosa* has been subject to rigorous assessment in context with the review of policy for the glassy winged sharpshooter, a vector of *X. fastidiosa*, in 2002 (Biosecurity Australia 2002) and with significant trade of table grapes into eastern Australian states since that time. Should new information suggest there is a change in the risk profile of this disease and/or its vectors, this would initiate a further review process to ensure appropriate measures are in place to reduce the risks posed to meet Australia's appropriate level of protection.	Assessment not required	No
CHROMALVEOLATA						
Globisporangium ultimum (Trow) Uzuhashi, Tojo & Kakish, 2010 Synonym: *Pythium ultimum* Trow [Saprolegniales: Pythiaceae]	Yes (Farr & Rossman 2014) Recorded on *Phaseolus vulgaris.*	Yes ACT, NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Globisporangium irregulare (Buisman) Uzuhashi, Tojo & Kashish, 2010 Synonym: *Pythium irregulare* Buisman, 1927 [Saprolegniales: Pythiaceae]	Yes (Farr & Rossman 2014) Recorded on *Ananas comosus.*	Yes NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Phytophthora cryptogea Pethybr. & Laff. 1919 [Peronosporales: Pythiaceae] Phytophthora root rot	Yes (Farr & Rossman 2014) Recorded on *Chrysanthemum* spp.	Yes ACT, NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Plasmopara viticola (Berk. & M.A. Curtis) Berl. & De Toni, 1888 Synonym: *Botrytis viticola* Berk. & M.A. Curtis, 1848 [Peronosporales: Peronosporaceae] Grapevine downy mildew	Yes (Farr & Rossman 2014)	Yes ACT, NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
FUNGI						
Alternaria alternata (Fr.) Keissl. [Pleosporales: Pleosporaceae]	Yes (Farr & Rossman 2014)	Yes ACT, NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Armillaria mellea (Vahl : Fr.) P. Kumm. [Agaricales: Physalacriaceae] Armillaria root rot	Yes (Farr & Rossman 2014)	No Plant Health Australia (2001) has a single record each for NSW and Qld, however, these are likely to be *A. luteobubalina* and not *A. mellea* (CABI 2015).	No Survives on diseased wood and roots below ground. Infects roots and is not typically soil borne (Pearson & Goheen 1988). Infection is transmitted from spores to exposed damaged roots, rhizomorphs in soil and between plants and their roots (Flaherty et al. 1992). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Aspergillus awamori Nakaz. Synonym: *Aspergillus niger* var. *awamori* (Nakaz.) Al-Musallam [Eurotiales: Trichocomaceae]	Yes (Ranzoni 1968)	No records found	Yes *Aspergillus* spores are blown from soil onto the surface of berries and may remain superficial without invading the pulp. The penetration and fungal infection is mediated by damaged berry skin and presence of spores at the wound (Leong 2005). Usually infects berries as a postharvest rot (Perrone et al. 2006).	Yes *Aspergillus* spp. are rapidly growing filamentous fungi or moulds that are ubiquitous in the environment and are found worldwide. *Aspergillus* disperse easily and grow almost anywhere when food and water are available (Bennett 2010; Leong, Hocking & Pitt 2004) and many species are common in vineyards (Selouane et al. 2009). Other *Aspergillus* species are established in Australia (Leong et al. 2006), including *Aspergillus niger* (Leong 2005), which is a related species to *A. awamori* (Varga et al. 2011).	No *Aspergillus* spp. are secondary invaders of grape berries that have been damaged by insects, pathogens, environmental factors such as rain and wind (Somma, Perrone & Logrieco 2012), or through fractures caused by partial detachment of berries at the pedicel (Jarvis & Traquair 1984). Furthermore, other species of *Aspergillus* are already present throughout Australia (Plant Health Australia 2001), including *A. niger*, which is already known to be associated with grape berries (Leong et al. 2006). Introduction of this species is unlikely to have economic consequences.	No
Aspergillus flavus Link [Eurotiales: Trichocomaceae]	Yes (de Luna-López et al. 2013; Ranzoni 1968)	Yes ACT, NSW, Qld, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Aspergillus nidulans (Eidam) G. Winter [Eurotiales: Trichocomaceae]	Yes (Ranzoni 1968)	Yes NT, SA, Vic. (Plant Health Australia 2001) Not known to be present in WA	Assessment not required	Assessment not required	Assessment not required	No
Aspergillus niger Tiegh. [Eurotiales: Trichocomaceae] Black mould	Yes (Ranzoni 1968)	Yes ACT, NSW, NT, Qld, SA, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Botryosphaeria corticola A.J.L. Phillips, A. Alves & J. Luque, Synonym: *Diplodia corticola* A.J.L. Phillips, A. Alves & J. Luque [Botryosphaeriales: Botryosphaeriaceae] Bot canker of oak	Yes (Candolfi-Arballo et al. 2010)	No records found	Yes *Botryosphaeria* species are most commonly associated with wood decay and canker (Úrbez-Torres, Gubler & Luque 2007) but can also be associated with bunch rot (Cooperative Research Centre for Viticulture 2005; Wunderlich et al. 2010).	Yes Other species of *Botryosphaeria* are already present in Australia (Plant Health Australia 2001), which suggests that new species could establish and spread.	No This species host range is limited to some *Quercus* species, *Cercis canadensis* and *Vitis vinifera* (Farr & Rossman 2014). On grapevine, this species was associated with black streaks and brown-red wood in Mexico. In Australia, other species of *Botryosphaeria* are associated with Botryosphaeria canker in grapevine wood and have also been found on berries at harvest (Wunderlich et al. 2010). Current management practises for other species of *Botryosphaeria* on grapevine in Australia are likely to control this species.	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Botryosphaeria dothidea (Moug.) Ces. & De Not. Synonym: *Fusicoccum aesculi* Sacc. [Botryosphaeriales: Botryosphaeriaceae] Canker	Yes (Valencia-Botín et al. 2003)	Yes NSW, Qld, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Botryosphaeria obtusa (Schwein.) Shoemaker Synonyms: *Diplodia seriata* De Not.; *Sphaeria obtusa* Schwein., [Botryosphaeriales: Botryosphaeriaceae] Dead arm	Yes (Úrbez-Torres et al. 2008)	Yes ACT, NSW, Qld, SA, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Cladosporium herbarum (Pers.) Link Synonym: *Mycosphaerella tassiana* (De Not.) Johanson [Capnodiales: Meruliaceae] Summer bunch rot	Yes (Ainsworth 1952; Farr & Rossman 2014)	Yes NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Colletotrichum acutatum J.H. Simmonds Synonym: *Glomerella acutata* Guerber & J.C. Correll [Glomerellales: Glomerellaceae] Anthracnose	Yes (Farr & Rossman 2014)	Yes NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Colletotrichum gloeosporioides (Penz.) Penz. & Sacc. Synonym: *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk, [Glomerellales: Glomerellaceae] Anthracnose	Yes (Farr & Rossman 2014)	Yes ACT, NSW, NT, Qld, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Diatrype stigma (Hoffm.) Fr. Synonym: *Sphaeria stigma* Hoffm. [Xylariales: Diatrypaceae]	Yes (Acero et al. 2004)	Yes NT (Plant Health Australia 2001) Not known to be present in WA	No Reported from cankered wood of grapevines in California (Trouillas & Gubler 2010; Trouillas, Úrbez-Torres & Gudmestad 2010). Trouillas and Gubler (2010) report colonisation of dormant canes/mature wood causing vascular necrosis. Moreover, no perithecia have been found in association with grapevine material, suggesting it may not be capable of completing its life cycle on grapevines (Trouillas & Gubler 2010). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Diatrypella verruciformis (Ehrh.) Nitschke Synonym: *Sphaeria verruciformis* Ehrh. [Xylariales: Diatrypaceae]	Yes (Chacon 2003)	No records found	No Reported in association with cankered wood of grapevines (Trouillas & Gubler 2010). Isolates were unable to produce lesions experimentally, suggesting it is a saprophyte rather than pathogenic on grapevines (Trouillas & Gubler 2010). Perithecia are rarely observed on grapevines, suggesting it is not capable of completing its life cycle on its grapevine hosts (Trouillas & Gubler 2010). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Elsinoë ampelina Shear Synonym: *Sphaceloma ampelinum* de Bary [Myriangiales: Elsinoaceae] Grape anthracnose	Yes (Alvarez 1976)	Yes NT (Plant Health Australia 2001), Qld (Simmonds 1966), SA (Cook & Dubé 1989), Tas. (Sampson & Walker 1982), Vic. (Cunnington 2003), WA (Shivas 1989)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Erysiphe necator var. *necator* Schwein. Synonyms: *Oidium tuckeri* Berk.; *Uncinula necator* (Schwein.) Burrill; *Uncinula americana* Howe [Erysiphales: Erysiphaceae] Grapevine powdery mildew	Yes (Alvarez 1976)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Eutypa lata (Pers.) Tul. & C. Tul. Synonyms*: Libertella blepharis* A.L. Sm.; *Eutypa armeniacae* Hansf. & M.V. Carter [Xylariales: Diatrypaceae] Eutypa dieback	Yes (Munkvold 2001)	Yes NSW (Trouillas et al. 2011), SA (Cook & Dubé 1989), Tas. (Sampson & Walker 1982), Vic. (Cunnington 2003). Not known to be present in WA. The record of *E. lata* in WA (Shivas 1989) is considered a dubious record (DAFWA 2016). In addition, specific surveys and general surveillance mechanisms in WA support the absence of this pest from WA (DAFWA 2016).	No *Eutypa lata* is generally associated with trunk and stem cankers (Ellis 2009; Ellis & Nita 2009). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

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Fusarium oxysporum Schltdl. Synonym: *Fusarium angustum* Sherb. [Hypocreales: Nectriaceae] Fusarium wilt	Yes (Ceja-Torres et al. 2000)	Yes ACT, NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Fusarium proliferatum (Matsushima) Nirenberg ex Gerlach & Nirenberg Synonym: *Cephalosporium proliferatum* Matsush. [Hypocreales: Nectriaceae]	Yes (Ochoa Fuentes et al. 2013)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Gibberella intricans Wollenw. Synonym: *Fusarium equiseti* (Corda) Sacc. [Hypocreales: Nectriaceae] Fusarium stalk rot	Yes (Vásquez-López et al. 2012)	Yes NSW, NT, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Greeneria uvicola (Berk. & M.A. Curtis) Punith. Synonym: *Melanconium fuligineum* (Ellis) Viala & Ravaz 1892 [Diaporthales: Gnomoniaceae] Bitter rot	Yes, but not in the State of Sonora. Only one record of *G. uvicola* being present in Mexico was found, with distribution limited to the state of Coahuila (Alvarez 1976). There have been no records of this species in Sonora. Should a recent record of *G. uvicola* be found for Sonora, or should this pest be detected in Sonora in the future, then this would need to be reported to Australia immediately and the assessment of this species will be reviewed accordingly.	Assessment not required	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Guignardia bidwellii (Ellis) Viala & Ravaz Synonyms: *Phyllosticta ampelicida* (Engelm.) Aa; *Sphaeria bidwellii* Ellis; *Botryosphaeria bidwellii* (Ellis) Petr.; *Carlia bidwellii* (Ellis) Prunet [Botryosphaeriales: Botryosphaeriaceae] Black rot	Yes (Alvarez 1976; CABI 1991; Instituto Nacional de Investigaciones Forestales 2010)	No records found	Yes Affects grape leaf, stem, peduncle and fruit (Ramsdell & Milholland 1988). The pathogen attacks all parts of the vine, predominantly berry clusters (Singh et al. 1999).	Yes *Guignardia bidwellii* overwinters in mummified berries, either in the vine or on the ground. Can also overwinter for two years within infected stems. Ascospores are airborne and disperse moderate distances and conidia are splash dispersed only short distances (Wilcox 2003). *Guignardia bidwellii* has a range of hosts, including *Ampelopsis* spp., *Cissus* spp., *Citrus* spp., *Vitis* spp., *Arachis hypogaea* (peanut) and *Asplenium nidus* (bird's nest fern), which are widely distributed in home gardens, nurseries and orchards in Australia (Eyres, Wood & Taylor 2006; Farr & Rossman 2012).	Yes Black rot is an important fungal disease of grapes that originated in eastern North America, but now occurs in parts of Europe, South America and Asia (Wilcox 2003). Crop losses can range from 5 to 80 per cent (Ramsdell & Milholland 1988) and are depending on weather, inoculum levels and cultivar susceptibility.	Yes (EP)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Lasiodiplodia theobromae (Pat.) Griffon & Maubl. Synonyms: *Botryosphaeria rhodina* (Berk. & M.A. Curtis) Arx,; *Physalospora rhodina* Berk. & M.A. Curtis,; *Botryodiplodia theobromae* Pat. [Botryosphaeriales: Botryosphaeriaceae]	Yes (Úrbez-Torres et al. 2008)	Yes NSW, NT, Qld, SA, WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Mycosphaerella personata B.B. Higgins Synonym: *Pseudocercospora vitis* (Lév.) Speg. [Capnodiales: Mycosphaerellaceae] Isariopsis blight	Yes (Farr & Rossman 2014)	Yes NSW, Vic. (Plant Health Australia 2001), Qld (Simmonds 1966), SA (Cook & Dubé 1989) Not known to be present in WA	No Infects leaves (McGrew & Pollack 1988). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Neofusicoccum australe (Slippers, Crous & M.J. Wingf.) Crous, Slippers & A.J.L. Phillips Synonym: *Botryosphaeria australis* Slippers, Crous & M.J. Wingf. [Botryosphaeriales: Botryosphaeriaceae]	Yes (Candolfi-Arballo et al. 2010)	Yes NSW, SA, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Neofusicoccum vitifusiforme (Van Niekerk & Crous) Crous, Slippers & A.J.L. Phillips Synonym: *Fusicoccum vitifusiforme* Van Niekerk & Crous [Botryosphaeriales: Botryosphaeriaceae]	Yes (Candolfi-Arballo et al. 2010)	No records found	No A grapevine trunk disease considered to be a weak pathogen of grapevine (Mondello et al. 2013; Úrbez-Torres et al. 2012). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No
Phakopsora euvitis Y. Ono [Pucciniales: Phakopsoraceae] Grapevine leaf rust	No No specific records of presence in Mexico under the name *P. euvitis* were found. *Phakopsora ampelopsidis* was recorded on *Vitis* sp. in Mexico (Farr & Rossman 2014). However, the revised distribution by Ono (2000) places *P. euvitis* and another species, *P. uva,* as the *Phakopsora* species being involved in causing grapevine leaf rust in the Americas. According to Ono's revision, *P. ampelopsidis* is the species occurring only on	Assessment not required	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
	the genus *Ampelopsidis*. As the record in Mexico is on grapevine, it could be *P. euvitis* or *P. uva* rather than *P. ampelopsidis.* However, to date, there is no conclusive evidence of *P. euvitis* being present in Mexico. If new information becomes available to support that *P. euvitis* is present in Mexico, the assessment of this pest for table grapes from Sonora will be reviewed.					
Phakopsora uva Buriticá & Hennen [Pucciniales: Phakopsoraceae] American grapevine leaf rust	Yes (Buritica 1999)	No records found	No Infects leaves of *Vitis vinifera* (Chatasiri & Ono 2008; Ono 2000). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Phomopsis viticola (Sacc.) Sacc. Synonyms: *Phomopsis ampelina* (Berk. & M.A. Curtis) Grove; *Diaporthe ampelina* (Berk & M.A. Curtis) R.R. Gomes, C. Glienke & Crous,; [Diaporthales: Diaporthaceae] Phomopsis cane and leaf spot, Excoriose (Europe), Dead arm (USA)	Yes (Alvarez 1976)	Yes NSW, Qld, SA, Vic. (Burges, Taylor & Kumar 2005; Plant Health Australia 2001), Tas. (Mostert, Corus & Kang 2001) Not known to be present in WA. Plant Health Australia (2001) has records for WA, but these have been identified as *Diaporthe australafricana* by molecular analysis (Burges, Taylor & Kumar 2005; Poole & Hammond 2011a).	Yes It infects all parts of the grape bunch including rachis, pedicels and berries (Hewitt & Pearson 1988).	Yes *Phomopsis viticola* is established in temperate climatic regions throughout the viticultural world and has been reported in Africa, Asia, Australia (except WA), Europe and North America (Hewitt & Pearson 1988). Spores of *P. viticola* are dispersed by rain splash and insects within the vineyard. Long distance dispersal occurs by movement of infected/contaminated propagation material, pruning equipment and agricultural machinery (Burges, Taylor & Kumar 2005).	Yes *Phomopsis viticola* is a serious pathogen of grapes in several viticultural regions of the world (Hewitt & Pearson 1988). It can cause vine stunting and reduced fruit yield (Burges, Taylor & Kumar 2005), as well as lower the quality of fruit and kill grafted and other nursery stock (Hewitt & Pearson 1988).	Yes (EP, WA)

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Pilidiella diplodiella (Speg.) Crous & Van Niekerk Synonyms: *Coniella diplodiella* (Speg.) Petr. & Syd., 1927; *Coniothyrium diplodiella* (Speg.) Sacc. [Diaporthales: Schizoparmaceae] White rot	Yes, but not in the State of Sonora. Reports limit distribution to the states of Aguascalientes and Coahuila (on grapes) (Alvarez 1976) and Tabasco (on *Hibiscus sabdariffa*) (Sánchez et al. 2011). There have been no records of this species in Sonora. Should a recent record of *P. diplodiella* be found for Sonora, or should this pest be detected in Sonora in the future, then this would need to be reported to Australia immediately and this species will be reviewed accordingly.	Assessment not required	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Pleospora tarda E. G. Simmons Synonym: *Stemphylium botryosum* Sacc. [Pleosporales: Pleosporaceae] Black mould	Yes (Farr & Rossman 2014)	Yes NSW, Qld, Vic., Tas., WA (Plant Health Australia 2001), SA (Cook & Dubé 1989)	Assessment not required	Assessment not required	Assessment not required	No
Rhizopus stolonifer (Ehrenb.) Vuill. [Mucorales: Mucoraceae] Fruit rot	Yes (Farr & Rossman 2014)	Yes NSW, NT, Qld, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Rosellinia necatrix Berl. Ex Prill. Synonym: *Dematophora necatrix* R. Hartig, [Xylariales: Xylariaceae] White root rot of trees	Yes (Alvarez 1976)	Yes NSW, Qld, WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Septoria ampelina Berk. & M.A. Curtis [Capnodiales: Mycosphaerellaceae] Septoria leaf spot	Yes (Farr & Rossman 2014)	No records found	No Causes leaf spot (Farr & Rossman 2014). No evidence of an association with grape bunches was found.	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Stereum hirsutum (Willd.) Pers. Synonyms: *Stereum complicatum* (Fr.) Fr.; *Stereum rameale* (Schwein.) Burt; *Stereum styracifluum* (Schwein.) Fr. [Russulales: Stereaceae] Esca disease complex	Yes (Farr & Rossman 2014)	Yes NSW, Qld, SA, Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
Verticillium dahliae Kleb. [Hypocreales: Plectosphaerellaceae]	Yes (Farr & Rossman 2014)	Yes ACT, NSW, Qld, SA, Tas., Vic., WA (Plant Health Australia 2001)	Assessment not required	Assessment not required	Assessment not required	No
VIRUSES						
Arabis mosaic virus [Secoviridae: Nepovirus] Hop bare-bine	Yes. On *Alstroemeria* sp. (CABI 2014; CABI & EPPO 2015)	Yes Vic. on *Narcissus* (Sharkey, Hepworth & Whattam 1996) Historical records of the hop-strain of this virus in Tas. (Munro 1987) but it has since been considered eradicated (Pethybridge et al. 2008). Not known to be present in WA	Yes This virus is associated with grapevine degeneration or decline (Martelli 2010). Transmitted through seed of a number of species (CABI & EPPO 1997a; Murant 1970). Found in infected weed seeds (Murant 1983).	No Not seed transmitted in grapevine (Lazar, Kolber & Laehoezky 1990). Spread occurs via nematode vectors including *Xiphinema diversicaudatum,* which are absent or have a limited distribution (Moran 1995; Pethybridge et al. 2008; Plant Health Australia 2001) or via mechanical inoculation (Brunt et al. 1996b).	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Carnation ringspot virus (CRSV) Synonym: Carnation ringspot dianthovirus [Tombusviridae: Dianthovirus]	Yes (CABI 2014)	Yes NSW, Vic. (ICTVdB Management 2002) Not known to be present in WA	Yes Associated with grapes in Europe. Infects some species systemically and therefore is potentially present in fruit.	No Spread occurs primarily via grafting and mechanical inoculation (Lommel, Stenger & Morris 1983), and potentially via contaminated soil from root exudates and/or the nematode vectors *Longidorus elongatus, L. macrosoma* and *Xiphinema diversicaudatum* (Brown & Trudgill 1984). These nematodes are not known to occur in Australia. These are unlikely to occur from fruit for human consumption. No evidence of seed transmission was found.	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Grapevine fanleaf virus [Secoviridae: Nepovirus]	Yes (Teliz & Goheen 1968; Velásquez-Valle, Reveles-Torres & Amador-Ramírez 2013)	Yes NSW (Plant Health Australia 2001), SA (Habili, Rowhani & Symons 2001; Stansbury, McKirdy & Power 2000), Vic. (Habili, Rowhani & Symons 2001) Not known to be present in WA	Yes Seed borne in grapevine (Cory & Hewitt 1968; Lazar, Kolber & Laehoezky 1990) and present in sap (Martelli, Walter & Pinck 2001).	No Seed transmitted in grapevine occasionally (Cory & Hewitt 1968; Lazar, Kolber & Laehoezky 1990; Mink 1993) and by grafting (Martelli, Walter & Pinck 2001). Infected grapevine seedlings are very unlikely to establish, as demonstrated by the previous full assessment of the likelihood of establishment for Tomato black ring virus (Department of Agriculture 2015). The chance that infected grape seeds from fruit waste will germinate is small. If germination does occur, seedlings are unlikely to survive. Transmitted by nematodes (*Xiphinema index*, and occasionally by *X. italiae*) (Brunt et al. 1996a; Cohn, Tanne & Nitzany 1970; Martelli, Walter & Pinck 2001)) and by grafting (Stace-Smith 1984). Transmission by *X. vuittenezi* has also been suspected but not proven (CIHEAM 2006). These nematodes are not known to be present in WA (DAWA 2006).	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
				Transmission via nematode from fruit for human consumption is unlikely.		
Grapevine leafroll associated virus (GLRaV) [Closteroviridae: Unassigned] Grapevine leafroll disease	Yes (Teliz & Goheen 1968; Velásquez-Valle, Reveles-Torres & Amador-Ramírez 2013)	Yes NSW, Qld, SA, Vic., WA (Constable & Rodoni 2011; Peake et al. 2004)	Assessment not required	Assessment not required	Assessment not required	No
Grapevine corky bark virus [Betaflexiviridae: Vitivirus] Rugose wood complex	Yes (Teliz & Goheen 1968) No records were found about what Grapevine virus strain is present in Mexico and causing corky bark symptoms.	Yes Corky bark is part of the Rugose wood complex disease and is associated with Grapevine viruses A, B and D (Constable, Nicholas & Rodoni 2010). GVA is present in Qld (Poole & Hammond 2011a), SA (Habili & Symons 2000), Vic. (Plant Health Australia 2001) and WA (Habili, Cameron & Randles 2009). GVB is present in SA and Vic. (Habili, Cameron & Randles 2009). GVD is present in SA and Vic. (Constable, Nicholas & Rodoni 2010). GVB and GVD are not known to be present in WA.	Yes Infects systemically (Martelli 1997); probably present in fruit.	No Grapevine corky bark virus is not seed transmitted. It is transmitted by grafting and by the mealybugs *Planococcus ficus*, *Pseudococcus longispinus* and *Pseudococcus affinis* (CIHEAM 2006). Unlikely to be co-transported with a vector insect or to be transmitted from imported fruit to a suitable host plant.	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Strawberry latent ringspot virus (SLRSV) Synonyms: Aesculus line pattern virus (Schmelzer and Schmidt, 1968); Rhubarb virus 5 [Secoviridae: Unassigned]	Yes (CABI 2014)	No Once recorded in SA, but there are no further reports and the department considers the virus to be absent from Australia	Yes Infects plants systemically (Murant 1974).	No Seed transmission has not been recorded in grapevine. Spread occurs via its root-feeding nematode vectors *Xiphinema diversicaudatum* and *X. coxi* (CABI 2014). Both nematodes are absent from Australia. Can be transmitted by grafting (Brunt et al. 1996b) but rachis material is not suitable for grafting.	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Tomato ringspot virus [Secoviridae: Nepovirus]	Yes (de la Torre-Almaraz et al. 1998)	No Recorded in SA (Chu, Francki & Hatta 1983; Cook & Dubé 1989), but there are no further records, the infected plants no longer exist, and the virus is believed to be absent from Australia.	Yes Infects systemically; present in fruit and seed (Gonsalves 1988; Uyemoto 1975).	No Seed transmitted in grapevine occasionally (Uyemoto 1975). Also transmitted by nematodes (*Xiphinema* spp.) and by grafting (Stace-Smith 1984). Transmission via nematode from fruit for human consumption is unlikely. Infected grapevine seedlings are very unlikely to establish, as demonstrated by the previous full assessment of the likelihood of establishment for Tomato black ring virus (Department of Agriculture 2015). The chance that infected grape seeds from fruit waste will germinate is small. If germination does occur, seedlings are unlikely to survive.	Assessment not required	No
Tomato spotted wilt virus Synonyms: Tomato spotted wilt tospovirus; Pineapple yellow spot virus [Bunyaviridae: Tospovirus]	Yes (de la Torre-Almaraz et al. 1998)	Yes NSW, Qld, SA, Vic., WA (Plant Health Australia 2001), NT, Tas. (CABI 1999)	Assessment not required	Assessment not required	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
VIROIDS						
Citrus exocortis viroid (CEVd) [Pospiviroidae: Pospiviroid] Citrus scaly butt, citrus bark shelling	Yes (Guerrero Gámez et al. 2013)	Yes NSW, Qld, SA (Barkley & Büchen-Osmond 1988) Not known to be present in WA	Yes Grapevine is a host of CEVd (Garcia-Arenal, Pallas & Flores 1987) and transmission of the viroid via grape seed has been observed (Wan Chow Wah & Symons 1997).	No The viroid may be transmitted by grafting, abrasion and through seed (Little & Rezaian 2003; Singh, Ready & Nie 2003; Wan Chow Wah & Symons 1997). Mechanical transmission from fruit for human consumption is unlikely. Infected grapevine seedlings are very unlikely to establish, as demonstrated by the previous full assessment of the likelihood of establishment for Tomato black ring virus (Department of Agriculture 2015). The chance that infected grape seeds from fruit waste will germinate is small. If germination does occur, seedlings are unlikely to survive.	Assessment not required	No

Pest	Present in Mexico	Present within Australia	Potential to be on pathway	Potential for establishment and spread	Potential for economic consequences	Pest risk assessment required
Hop stunt viroid (HSVd) [Pospiviroidae: Hostuviroid]	Yes (Guerrero Gámez et al. 2013)	Yes SA, Vic. (Koltunow, Krake & Rezaian 1988) Not known to be present in WA	Yes HSVd has been demonstrated to be seed transmitted in grapevines (Wan Chow Wah & Symons 1999), but not in any other species. Wan Chow Wah and Symons (1999) confirmed that, in grapevines, HSVd can be transmitted by seed to seedlings. (This authority is cited in Little and Rezaian (2003) which is then cited in Albrechtsen (2006)). HSVd infects systemically and is present in all parts of the plant (Li et al. 2006; Yaguchi & Takahashi 1984).	No The viroid may be transmitted via mechanical means (Sano 2003), through cuttings and grafting (European Food Safety Authority 2008) or via grape seed (Wan Chow Wah & Symons 1999). Mechanical transmission from fruit for human consumption is unlikely. Infected grapevine seedlings are very unlikely to establish, as demonstrated by the previous full assessment of the likelihood of establishment for Tomato black ring virus (Department of Agriculture 2015). The chance that infected grape seeds from fruit waste will germinate is small. If germination does occur, seedlings are unlikely to survive.	Assessment not required	No

Pest of Human Health Concern	Present in Mexico	Present within Australia	Potential to be on pathway	Potential Human Health Risk
ARTHROPODS				
Araneae				
Cheiracanthium inclusum (Hentz, 1847) [Miturgidae] Yellow sac spider	Yes (Barnes 2003)	No records found	Yes, as a contaminant. Present on grapevine (Costello & Daane 1999) and it is found in grape bunches at harvest time (Carrol 2003).	Yes This spider has been implicated in human poisonings in the USA (Vest 1999). Other species in this genus are already present in Australia (Vest 1999), which suggests that the Australian environment would be suitable for it to establish and spread. As a predator, it would compete with native species and may affect prey species if it established in Australia. Risk management measures will be required for this species. Risk management measure options will be included in the Pest Risk Management chapter.
Latrodectus hesperus Chamberlin & Ivie, 1935 [Theridiidae] Black widow spider	Yes (Breen 2013; Salomon 2011)	No records found	Yes, as a contaminant. Has been found in table grape bunches exported from California (Liu et al. 2008).	Yes Members of the genus have highly potent venom. In humans, their bites commonly result in severe muscle pain, cramps and nausea (but are rarely fatal) (Garb, González & Gillespie 2004). Other species in this genus are already present in Australia (Garb, González & Gillespie 2004), which suggests that the Australian environment would be suitable for it to establish and spread. As a predator, it would compete with native species and may affect prey species if it established in Australia. Risk management measures will be required for this species. Risk management measure options will be included in the Pest Risk Management chapter.

Appendix B Issues raised in stakeholder comments

A summary of key stakeholder comments and how they were considered in the final report is given below.

Comment 1: One stakeholder raised concerns over the methodology used in the pest categorisation process that led to several organisms not requiring a pest risk assessment.

Response: The Australian Government Department of Agriculture and Water Resources has conducted the pest categorisation process in accordance with ISPM 11 (FAO 2013). The evidence considered does not support a pathway association for all pests considered. For some of the pests, for example for pathogens which are seed transmitted in table grapes and have no other means of establishment, the evidence considered (including full assessments for similar pathogens that are seed transmitted) does not support a potential for the pests to establish and spread. The department considers that the available evidence does not justify a full pest risk assessment for these organisms.

Comment 2: One stakeholder considered that two of the pests for which a pest risk assessment was conducted, that is Guignardia bidwellii *and* Phakopsora euvitis*, are not present in Mexico.*

Response: The Australian Government Department of Agriculture and Water Resources re-examined the available evidence relating to the presence of *Guignardia bidwellii* and *Phakopsora euvitis* in Mexico. For *Guignardia bidwellii*, additional references supporting its presence in Sonora were found and added in Appendix A. As the stakeholder could not provide any evidence to support that the reporting of *G. bidwellii* in the references cited in the report was erroneous, the Australian Government Department of Agriculture and Water Resources maintains the status of this pest in the final report.

For *P. euvitis*, no conclusive evidence could be found to support that this pest is present in Mexico and the status of this pest in Appendix A was changed to 'not present in Mexico'. However, if new information becomes available to support that *P. euvitis* is present in Mexico, the assessment of this pest for table grapes from Sonora will be reviewed.

Comment 3: One stakeholder raised concerns over the option of a systems approach as a proposed risk management measure for spiders.

Response: The Australian Government Department of Agriculture and Water Resources considers that the proposed systems approach based on vineyard and packing management and visual inspection would reduce the risk posed by the spiders *Cheiracanthium inclusum* (yellow sac spider) and *Latrodectus hesperus* (black widow spider) to an acceptable level.

The proposed systems approach for these spiders includes that fruit must be packed in the packing house, not in the field, and be inspected for spiders. A similar systems approach is approved for similar pests for table grapes from China (Biosecurity Australia 2011a).

In addition, the systems approach can be reviewed at any time, if these spiders are intercepted.

Glossary

Term or abbreviation	Definition
Additional declaration	A statement that is required by an importing country to be entered on a phytosanitary certificate and which provides specific additional information on a consignment in relation to regulated pests (FAO 2015a).
Appropriate level of protection (ALOP)	The level of protection deemed appropriate by the Member establishing a sanitary or phytosanitary measure to protect human, animal or plant life or health within its territory (WTO 1995).
Appropriate level of protection (ALOP) for Australia	The *Biosecurity Act 2015* defines the appropriate level of protection (or ALOP) for Australia as a high level of sanitary and phytosanitary protection aimed at reducing biosecurity risks to very low, but not to zero.
Area	An officially defined country, part of a country or all or parts of several countries (FAO 2015a).
Area of low pest prevalence	An area, whether all of a country, part of a country, or all parts of several countries, as identified by the competent authorities, in which a specific pest occurs at low levels and which is subject to effective surveillance, control or eradication measures (FAO 2015a).
Arthropod	The largest phylum of animals, including the insects, arachnids and crustaceans.
Australian territory	Australian territory as referenced in the *Biosecurity Act 2015* refers to Australia, Christmas Island and Cocos (Keeling) Islands.
Biosecurity	The prevention of the entry, establishment or spread of unwanted pests and infectious disease agents to protect human, animal or plant health or life, and the environment.
Biosecurity import risk analysis (BIRA)	The *Biosecurity Act 2015* defines a BIRA as an evaluation of the level of biosecurity risk associated with particular goods, or a particular class of goods, that may be imported, or proposed to be imported, into Australian territory, including, if necessary, the identification of conditions that must be met to manage the level of biosecurity risk associated with the goods, or the class of goods, to a level that achieves the ALOP for Australia. The risk analysis process is regulated under legislation.
Biosecurity measures	The *Biosecurity Act 2015* defines biosecurity measures as measures to manage any of the following: biosecurity risk, the risk of contagion of a listed human disease, the risk of listed human diseases entering, emerging, establishing themselves or spreading in Australian territory, and biosecurity emergencies and human biosecurity emergencies.
Biosecurity risk	The *Biosecurity Act 2015* refers to biosecurity risk as the likelihood of a disease or pest entering, establishing or spreading in Australian territory, and the potential for the disease or pest causing harm to human, animal or plant health, the environment, economic or community activities.
Cane (grapevine)	A cane is a ripened shoot of a grapevine that has grown from a new bud located on the cordon. A shoot is called a cane when it changes colour from green to brown during veraison. Shoots give rise to leaves, tendrils and grape clusters.
Consignment	A quantity of plants, plant products or other articles being moved from one country to another and covered, when required, by a single phytosanitary certificate (a consignment may be composed of one or more commodities or lots) (FAO 2015a).
Control (of a pest)	Suppression, containment or eradication of a pest population (FAO 2015a).
Crawler	Intermediate mobile nymph stage of certain Arthropods.
The department	The Australian Government Department of Agriculture and Water Resources.
Endangered area	An area where ecological factors favour the establishment of a pest whose presence in the area will result in economically important loss (FAO 2015a).

Term or abbreviation	Definition
Entry (of a pest)	Movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled (FAO 2015a).
Establishment (of a pest)	Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO 2015a).
Fresh	Living; not dried, deep-frozen or otherwise conserved (FAO 2015a).
Fumigation	A method of pest control that completely fills an area with gaseous pesticides to suffocate or poison the pests within.
Genus	A taxonomic category ranking below a family and above a species and generally consisting of a group of species exhibiting similar characteristics. In taxonomic nomenclature the genus name is used, either alone or followed by a Latin adjective or epithet, to form the name of a species.
Goods	The *Biosecurity Act 2015* defines goods as an animal, a plant (whether moveable or not), a sample or specimen of a disease agent, a pest, mail or any other article, substance or thing (including, but not limited to, any kind of moveable property).
Host	An organism that harbours a parasite, mutual partner, or commensal partner, typically providing nourishment and shelter.
Host range	Species capable, under natural conditions, of sustaining a specific pest or other organism (FAO 2015a).
Import permit	Official document authorising importation of a commodity in accordance with specified phytosanitary import requirements (FAO 2015a).
Infection	The internal 'endophytic' colonisation of a plant, or plant organ, and is generally associated with the development of disease symptoms as the integrity of cells and/or biological processes are disrupted.
Infestation (of a commodity)	Presence in a commodity of a living pest of the plant or plant product concerned. Infestation includes infection (FAO 2015a).
Inspection	Official visual examination of plants, plant products or other regulated articles to determine if pests are present or to determine compliance with phytosanitary regulations (FAO 2015a).
Intended use	Declared purpose for which plants, plant products, or other regulated articles are imported, produced or used (FAO 2015a).
Interception (of a pest)	The detection of a pest during inspection or testing of an imported consignment (FAO 2015a).
International Plant Protection Convention (IPPC)	The IPPC is an international plant health agreement, established in 1952, that aims to protect cultivated and wild plants by preventing the introduction and spread of pests. The IPPC provides an international framework for plant protection that includes developing International Standards for Phytosanitary Measures (ISPMs) for safeguarding plant resources.
International Standard for Phytosanitary Measures (ISPM)	An international standard adopted by the Conference of the Food and Agriculture Organization, the Interim Commission on Phytosanitary Measures or the Commission on Phytosanitary Measures, established under the IPCC (FAO 2015a).
Introduction (of a pest)	The entry of a pest resulting in its establishment (FAO 2015a).
Larva	A juvenile form of animal with indirect development, undergoing metamorphosis (for example, insects or amphibians).
Lot	A number of units of a single commodity, identifiable by its homogeneity of composition, origin et cetera, forming part of a consignment (FAO 2015a). Within this report a 'lot' refers to a quantity of fruit of a single variety, harvested from a single production site during a single pick and packed at one time.
Mature fruit	Commercial maturity is the start of the ripening process. The ripening process will then continue and provide a product that is consumer-acceptable. Maturity assessments include colour, starch, index, soluble solids content, flesh firmness, acidity, and ethylene production rate.

Term or abbreviation	Definition
National Plant Protection Organization (NPPO)	Official service established by a government to discharge the functions specified by the IPPC (FAO 2015a).
Non-regulated risk analysis	Refers to the process for conducting a risk analysis that is not regulated under legislation (Biosecurity import risk analysis guidelines 2016).
Nymph	The immature form of some insect species that undergoes incomplete metamorphosis, It is not to be confused with larva, as its overall form is already that of the adult.
Official control	The active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or for the management of regulated non-quarantine pests (FAO 2015a).
Orchard	A contiguous area of table grape trees operated as a single entity for food production.
Pathogen	A biological agent that can cause disease to its host.
Pathway	Any means that allows the entry or spread of a pest (FAO 2015a).
Pest	Any species, strain or biotype of plant, animal, or pathogenic agent injurious to plants or plant products (FAO 2015a).
Pest categorisation	The process for determining whether a pest has or has not the characteristics of a quarantine pest or those of a regulated non-quarantine pest (FAO 2015a).
Pest free area (PFA)	An area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained (FAO 2015a).
Pest free place of production	Place of production in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained for a defined period (FAO 2015a).
Pest free production site	A defined portion of a place of production in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained for a defined period and that is managed as a separate unit in the same way as a pest free place of production (FAO 2015a).
Pest risk analysis (PRA)	The process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it (FAO 2015a).
Pest risk assessment (for quarantine pests)	Evaluation of the probability of the introduction and spread of a pest and of the magnitude of the associated potential economic consequences (FAO 2015a).
Pest risk management (for quarantine pests)	Evaluation and selection of options to reduce the risk of introduction and spread of a pest (FAO 2015a).
Pest status (in an area)	Presence or absence, at the present time, of a pest in an area, including where appropriate its distribution, as officially determined using expert judgement on the basis of current and historical pest records and other information (FAO 2015a).
Phytosanitary certificate	An official paper document or its official electronic equivalent, consistent with the model of certificates of the IPPC, attesting that a consignment meets phytosanitary import requirements (FAO 2015a).
Phytosanitary certification	Use of phytosanitary procedures leading to the issue of a phytosanitary certificate (FAO 2015a).
Phytosanitary measure	Any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests (FAO 2015a). The term 'risk management measure' has been used in the risk analysis as this term is used in the *Biosecurity Act 2015*.
Phytosanitary procedure	Any official method for implementing phytosanitary measures including the performance of inspections, tests, surveillance or treatments in connection with regulated pests (FAO 2015a).

Term or abbreviation	Definition
Phytosanitary regulation	Official rule to prevent the introduction and/or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests, including establishment of procedures for phytosanitary certification (FAO 2015a).
Polyphagous	Feeding on a relatively large number of hosts from different plant family and/or genera.
PRA area	Area in relation to which a pest risk analysis is conducted (FAO 2015a).
Practically free	Of a consignment, field or place of production, without pests (or a specific pests) in numbers or quantities in excess of those that can be expected to result from, and be consistent with good cultural and handling practices employed in the production and marketing of the commodity (FAO 2015a).
Production site	In this report, a production site is a continuous planting of table grape trees treated as a single unit for pest management purposes. If a vineyard is subdivided into one or more units for pest management purposes, then each unit is a production site. If the vineyard is not subdivided, then the orchard is also the production site.
Pupa	An inactive life stage that only occurs in insects that undergo complete metamorphosis, for example butterflies and moths (Lepidoptera), beetles (Coleoptera) and bees, wasps and ants (Hymenoptera).
Quarantine	Official confinement of regulated articles for observation and research or for further inspection, testing or treatment (FAO 2015a).
Quarantine pest	A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (FAO 2015a).
Regulated article	Any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved (FAO 2015a).
Regulated pest	A quarantine pest or a regulated non-quarantine pest (FAO 2015a).
Restricted risk	Risk estimate with phytosanitary measure(s) applied.
Risk analysis	Refers to the technical or scientific process for assessing biosecurity risk and the development of risk mitigation measures (Biosecurity import risk analysis guidelines 2016).
Saprophyte	An organism deriving its nourishment from dead organic matter.
Spread (of a pest)	Expansion of the geographical distribution of a pest within an area (FAO 2015a).
SPS Agreement	WTO Agreement on the Application of Sanitary and Phytosanitary Measures.
Stakeholders	Government agencies, individuals, community or industry groups or organizations, whether in Australia or overseas, including the proponent/applicant for a specific proposal, who have an interest in the policy issues.
Surveillance	An official process which collects and records data on pest occurrence or absence by surveying, monitoring or other procedures (FAO 2015a).
Systems approach(es)	The integration of different risk management measures, at least two of which act independently, and which cumulatively achieve the appropriate level of protection against regulated pests.
Trash	Soil, splinters, twigs, leaves, and other plant material, other than fruit stalks.
Treatment	Official procedure for the killing, inactivation or removal of pests, or for rendering pests infertile or for devitalisation (FAO 2015a).
Unrestricted risk	Unrestricted risk estimates apply in the absence of risk mitigation measures.
Vector	An organism that does not cause disease itself, but which causes infection by conveying pathogens from one host to another.
Viable	Alive, able to germinate or capable of growth.

Term or abbreviation	Definition
Vineyard	A contiguous area of grapevines operated as a single entity for food production.

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