Department of
Primary Industries and
Regional Development

GOVERNMENT OF
WESTERN AUSTRALIA

Western Australian Viticulture Industry Biosecurity Plan

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Contributing Organisations

The Western Australian Viticulture Industry Biosecurity Plan was coordinated by the Department of Primary Industries and Regional Development and developed through a partnership approach using government and industry resources and expertise. The development of this plan was made possible by Royalties for Regions Funding. The following organisations and agencies were involved in the review of the plan:

- The Department of Primary Industries and Regional Development.
- Wines of Western Australia
- Table Grapes Western Australia

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Contents

List of acronyms

ACT – Australian Capital Territory

APC – Agricultural Produce Commission of Western Australia

DAFWA – Division of Agriculture and Food, Western Australia

DPIRD – Department of Primary Industries and Regional Development

EPPRD – Emergency Plant Pest Response Deed

GI – Geographical Indications

HPP – High Priority Pests

NSW – New South Wales

NT – Northern Territory

PaDIS – Pest and Disease Identification Service

PHA – Plant Health Australia

PPT – Potential Pest Threats

Qld - Queensland

PRA – Pest Risk Analysis

RD&E – Research, Development and Extension

SA – South Australia

Tas - Tasmania

TGWA – Table Grapes Western Australia

Vic - Victoria

WA – Western Australia

WAOL – Western Australian Organisms List

WAVIBM – Western Australian Viticulture Industry Biosecurity Manual

WAVIBP – Western Australian Viticulture Industry Biosecurity Plan

WoWA – Wines of Western Australia

Executive summary

Western Australia (WA) is fortunate to be free of a range of organisms that can impact on the production of grapes (*Vitis vinifera*) that are found in other locations around Australia. This assists the viticulture industries in WA, and the general community, to produce grapes at lower costs and with reduced chemical inputs than might otherwise be the case. The absence of certain organisms can also be beneficial in maintaining or developing export markets.

There are protocols in place that control the import of organisms into Western Australia that have been developed to minimise the risk of harmful exotic organisms entering the state. However, because of the high level of produce and people movement they can never be 100% guaranteed effective. Therefore, industries and supporting organisations need to be vigilant in monitoring for incursions and be prepared to act swiftly and effectively should any occur.

There are a lot of exotic organisms that may be found in association with grapevines that are found in other states of Australia. Over 250 exotic organisms were identified in a Pest Risk Analysis for importation of table grapes into WA from other Australian states in 2015. However, the level of economic impact these exotic organisms may have on the WA viticulture industries varies considerably and managing incursions of exotic organisms can be a costly exercise. Therefore it is important that the viticulture industries are aware of what potential threats they may face and the potential economic impact these threats pose to their industry.

This document, the Western Australian Viticulture Industry Biosecurity Plan (WAVIBP) has been developed to build biosecurity preparedness within the WA viticulture industry. The aim is to identify and categorise the potential pest threats based on their establishment and spread potential, economic impact, and a final industry rating of concern. This will provide both the industries and supporting organisations, including Government, with data on what exotic organisms to focus on, and assist in decision making about what steps should be taken should an incursion occur.

As a result of the pest risk assessment, 45 exotic organisms from the potential pest threats where rated as priority pest threats to the WA viticulture industries (listed in Table 1), six of these were rated as high priority pest threats.

Table 1 Priority pest threat list — exotic Australian pest threats to WA viticulture industries — as identified by a pest risk assessment

High priority pest threats
grape phylloxera (*Daktulosphaira vitifoliae*)
Queensland fruit fly (*Bactrocera tryoni*)
vine borer moth (*Echiomima sp.*)
black foot disease (*Ilyonectria macrodidyma*)
eutypa dieback (*Eutypa lata*)
phomopsis cane and leaf spot (*Phomopsis viticola)*
Priority pest threats
apple mealybug (*Phenacoccus aceris*)
black vine weevil (*Otiorhynchus sulcatus*)
citrophilus mealybug (*Pseudococcus calceolariae*)
European fruit lecanium scale (*Parthenolecanium corni*)
European wasp (*Vespula germanica*)
native weevil (*Ecrizothis boviei*)
tropical yellow tail moth (*Euproctis paradoxa*)
white peach scale (*Pseudaulacaspis pentagona*)
common starling (*Sturnus vulgaris*)
bitter rot (*Greeneria uvicola)*
Botryosphaeria dieback (*Botryosphaeria sarmentorum*)
Botryosphaeria dieback (*Dothiorella iberica*)
Botryosphaeria dieback (*Dothiorella neclivorem*)
Botryosphaeria dieback (*Dothiorella vidmadera*)
Botryosphaeria dieback (*Dothiorella vinea-gemmae*)

Botryosphaeria dieback (*Spencermartinsia plurivora*)
Botryosphaeria dieback (*Spencermartinsia viticola*)
Diatrypaceae dieback (*Cryptovalsa ampelina*)
Diatrypaceae dieback (*Diatrypella vulgaris*)
Diatrypaceae dieback (*Eutypella microtheca*)
esca disease (*Fomitiporia australiensis*)
esca disease (*Fomitiporia punctata*)
petri disease (*Phaeoacremonium aleophilum*)
petri disease (*Phaeoacremonium australiense*)
petri disease (*Phaeoacremonium parasiticum*)
Pestalotiopsis menezesiana
Pestalotiopsis uvicola
white rot (*Pilidiella castaneicola*)
white rot (*Pilidiella diplodiella*)
needle nematode (*Longidorus elongatus*)
dagger (fan leaf virus) nematode (*Xiphinema index*)
dagger (fan leaf virus) nematode (*Xiphinema italiae*)
Buckland Valley grapevine yellows (BVGY)
grapevine yellow speckle viroid (GYSVd) strain, 1
grapevine yellow speckle viroid (GYSVd) strain, 2
grapevine fan leaf virus (GFLV)
strawberry latent ringspot virus (SLRSV)
tomato ringspot virus (ToRSV)
grapevine virus B (GVB)

Introduction

Overview

Western Australia (WA) is fortunate to be free of a range of organisms that can impact on the production of grapes (*Vitis vinifera*) that are found in many other locations where grapes are grown in Australia and the world. This assists the viticulture industries in WA, and the general community, to produce grapes at lower costs and with reduced chemical inputs than might otherwise be the case.

There are protocols in place that control the import of products into Western Australia that have been developed to minimise the risk of harmful exotic organisms entering the state, however they can never be 100% guaranteed effective. Therefore industries need to be prepared to be able to deal swiftly and effectively should any incursions occur.

There are a lot of exotic organisms that may be found in association with grapevines that are found in other states of Australia (DAFWA, 2016). The level of economic impact these exotic organisms may have on the WA viticulture industries varies. Managing incursions of exotic organisms can be a costly exercise and while eradication of any incursion may sound the best approach, it may not always be cost effective. Therefore it is important that the viticulture industries are aware of what potential threats they may face and the potential economic impact these threats pose.

This document, the Western Australian Viticulture Industry Biosecurity Plan (WAVIBP) has been developed to build biosecurity preparedness within the WA viticulture industry. The aim is to reduce the impact to the WA viticulture industries from exotic organisms that are already established in other parts of Australia and may pose a threat to the viticulture industry's viability and sustainability.

A national Industry Biosecurity Plan for the Viticulture Industry has been produced by Plant Health Australia (PHA, 2013) that covers organisms exotic to Australia that pose a threat to the viticulture industry nationally.

The WAVIBP should be read as an accompaniment to the national Industry Biosecurity Plan for the Viticulture Industry, produced by Plant Health Australia. An electronic copy of the national plan is available through the email address listed below.

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Organisations with a stake in building biosecurity preparedness within the WA viticulture industry

Department of Primary Industries and Regional Development – Division of Agriculture and Food, Western Australia

The Division of Agriculture and Food, Western Australia (DAFWA) drives the economic development of Western Australia's agriculture and food sector, with a focus on export-led growth. They work with industries and businesses throughout the sector, helping them identify and capitalise on opportunities for growth as well as to manage and overcome obstacles.

They support all aspects of food and fibre production at each stage of the supply chain. This is achieved by building market knowledge and conducting innovative research and development and marketing and extension programs. They also develop and enforce regulations that ensure the production of high-quality, safe and healthy food for our customers in Australia and overseas.

DAFWA has a pivotal role in helping to protect and enhance the state's precious natural resources and valuable biosecurity status, and minimise the impact of climate variability. Their long-term commitment to biosecurity has helped maintain Western Australia's relative freedom from pests and diseases.

Wines of Western Australia

Wines of Western Australia (WoWA) is the peak industry body providing support to the wine sector in WA — representing producers, growers, and regional associations in the development of their regions. WoWA provides a range of services to growers and the industry.

WoWA employs a professional Chief Executive Officer to act as a focal point for communications and coordination within the industry. WoWA has a board of directors consisting of grower and distributor representatives from WA.

Agricultural Produce Commission (APC) – Wine Producers' Committee

The APC Wine Producers' Committee was established in 2016 under the APC Act 1988.

The Committee covers all Western Australian wine producers and consists of 10 members, representing the wine Geographical Indication (GI) locations of Western Australia.

Committee members are elected for a three year period with terms commencing in June and ending in May of the relevant year. Members may apply for re-election once their period of tenure has expired.

The Fee for service funds can be directed towards a range of services (a to m) as set out in the functions of the APC Act 1988, including support for marketing events, development of strategic plans for GI locations, and innovation, RD&E and biosecurity.

Table Grapes Western Australia

Table Grapes Western Australia (TGWA) is a representative grower based group that represents the table grape growers in Western Australia.

Agricultural Produce Commission (APC) – Table Grape Producers' Committee

The APC Table Grape Producers' Committee was established in 1991 under the APC Act 1988.

The Committee covers all Western Australian table grape producers and consists of seven table grape producers from Western Australia.

Committee members are elected for a three year period with terms commencing in June and ending in May of the relevant year. Members may apply for re-election once their period of tenure has expired.

The Fee for service funds are mainly directed towards promotion and table grape inspection services, but can be directed towards a range of services (a to l and m) as set out in the functions of the APC Act 1988.

Plant Health Australia

Plant Health Australia (PHA) is a public company, with members including the Australian Government, all state and territory governments, and a range of plant industry organisations. The company was formed to address high priority plant health issues, and to work with all its members to develop an internationally outstanding plant health management system that enhances Australia's plant health status and the sustainability and profitability of plant industries. PHA is charged with national biosecurity planning, to protect Australia's borders from exotic organisms not yet established in Australia that might harm Australian industries, the community or the environment.

Biosecurity planning

Biosecurity is about providing protection against risks posed by exotic organisms through actions such as exclusion, eradication and control. Effective biosecurity relies on all stakeholders, including government agencies, industry, and the public. WA state based biosecurity is much the same as national biosecurity only the exotic risks are those organisms that are already present in Australia, but not WA. Industry biosecurity planning is about building the industries preparedness to deal with exotic threats that may impact negatively on the viability of the industry. The process of biosecurity planning is similar whether for state exotic threats or national exotic threats — Figure 1 provides a schematic of industry biosecurity planning.

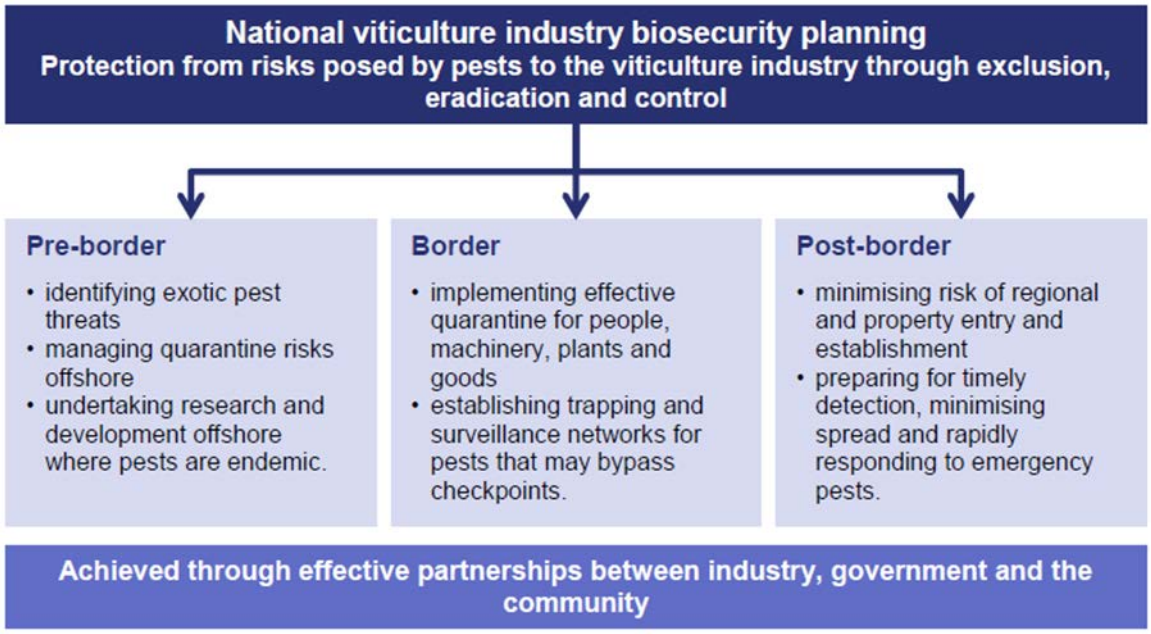

Figure 1 Industry biosecurity: a shared responsibility (taken from Plant Health Australia Ltd (2006) Industry Biosecurity Plan for the Viticulture Industry (Version 3.0-2013). Plant Health Australia, Canberra, ACT.)

Western Australia's geographical isolation provides a degree of natural protection from exotic threats in other states. WA's state quarantine system also helps to prevent the introduction of harmful exotic threats to plant industries in WA. However, there will always be some risk of an exotic organism entering Western Australia, whether through natural or assisted dispersal, as a result of increases in tourism, imports and exports, and mail. Biosecurity planning provides a mechanism for the viticulture industry, governments and other relevant stakeholders to prioritise pests of highest priority, analyse the risks they pose and put in place practices and procedures that would reduce the chance of pests becoming established. Increasing industry biosecurity preparedness reduces the chance of exotic pests becoming established, and allows for the rapid detection of an incursion while minimising any potential impacts.

This pre-emptive planning process ensures the industry will be better placed to maintain domestic and international trade, and reduces the social and economic costs of pest incursions on both growers and the wider community. Biosecurity planning also provides additional assurance to trading partners that the Western Australian viticulture industry has systems in place to control and manage biosecurity risks, which assists when negotiating access to new markets.

Background on the WA viticulture industry

Wine grapes

Western Australia's wine regions are recognised as some of the best in the world.

Western Australia produces roughly 45 million litres of wine annually (from roughly 68 000 tonnes of grapes), representing nearly 5% of Australian production by volume, or 12% by value.

Production is based predominantly on cool climate viticulture and premium wine varieties such as Cabernet Sauvignon, Shiraz, Merlot, Chardonnay, Sauvignon Blanc and Semillon. There were approximately 13 000ha of wine grape plantings in 2012, located from Perth down to Albany, with some 70% of planted area located in Margaret River and Great Southern regions.

The wine industry is a high value added crop, with the overall value to the Western Australian economy estimated at $795m in 2015. Sales are mainly local and national with international markets are gaining importance. The industry exports about 12% of its wines to more than 60 countries, mainly China, UK, Hong Kong and USA, worth about $45m in 2012.

Table grapes

Western Australia has a dynamic and progressive table grape industry which produces high quality table grapes mainly for the domestic market. Small volumes are also exported to international markets. The industry has grown considerably since 1992 with production increasing from 2200 tonnes in 1992 to more than 5700 tonnes in 2014.

Table grapes are grown commercially from Carnarvon in the Gascoyne, the Mid West near Geraldton, the Swan Valley and South West including Harvey, Donnybrook and Busselton areas.

Western Australian Viticulture Industry Biosecurity Plan development

The Western Australian Viticulture Industry Biosecurity Plan (WAVIBP) has been coordinated by DAFWA, in consultation with WoWA and TGWA. DAFWA carried out the initial pest identification and risk assessment which was followed by a broader stakeholder consultation process where stakeholder and expert comments were incorporated.

Key steps in the development of the WAVIBP included:

- identifying exotic organisms associated with grapevines that are found in other states and territories of Australia
- documenting the potential threat the identified organisms pose to the WA viticulture industry
- prioritising the threat list

The WAVIBP follows similar principles to the national Viticulture Industry Biosecurity Plan and focuses on threat identification and pest risk assessments.

The identification and risk assessment of biosecurity threats is achieved through a process of qualitative assessments. The primary goal is to coordinate identification of

exotic pest threats that could impact on productivity, sustainability and marketability, and to assess their potential impacts on the WA viticulture industry. This plan strengthens risk assessment work already being done nationally.

Review processes

With the support of the peak industry bodies and DPIRD, this plan should be reviewed on a continual basis, with a major review every 4-5 years.

Emergency Plant Pest Response Deed

By identifying key threats, a pre-emptive approach may be taken to risk management. Under this approach, mechanisms can be put into place to increase the response effectiveness if pest incursions occur. One such mechanism is the National Emergency Plant Pest Response Deed (EPPRD) that has been negotiated between PHA's government and industry members (PHA, 2013). The EPPRD ensures reliable and agreed funding arrangements are in place in advance of emergency plant pest incursions, and assists in the response to emergency plant pest incursions.

A similar mechanism is planned to be negotiated between DPIRC (on behalf of the WA Government) and the peak industry bodies representing the WA viticulture industries. The highest ranked threats to the WA viticulture industries as identified in the WAVIBP will be further evaluated and categorised to develop incident cost sharing agreements between Industry and Government parties.

WA Viticulture Industry Biosecurity Manual

Identification of high risk exotic organisms will also assist in the implementation of effective grower and community awareness campaigns, targeted biosecurity education and training programs for growers and diagnosticians, and development of pest-specific management plans.

The highest ranked threats to the WA viticulture industries as identified in this document will have management plans developed to assist with their management should incursions occur. These will be built into a Western Australian Viticulture Industry Biosecurity Manual (WAVIBM).

Biosecurity implementation

A framework for the implementation of biosecurity practices within the viticulture industry was developed as part of the national Industry Biosecurity Plan for the Viticulture Industry, produced by Plant Health Australia. Currently a range of biosecurity practices are undertaken within the viticulture industry nationally and these are outlined in the Risk mitigation plan in the national Industry Biosecurity Plan

for the Viticulture Industry (PHA, 2013). Further implementation within the framework of the WAVIBP, such as those practices outlined in Figure 2, may be investigated by the WA viticulture industry to increase its biosecurity preparedness.

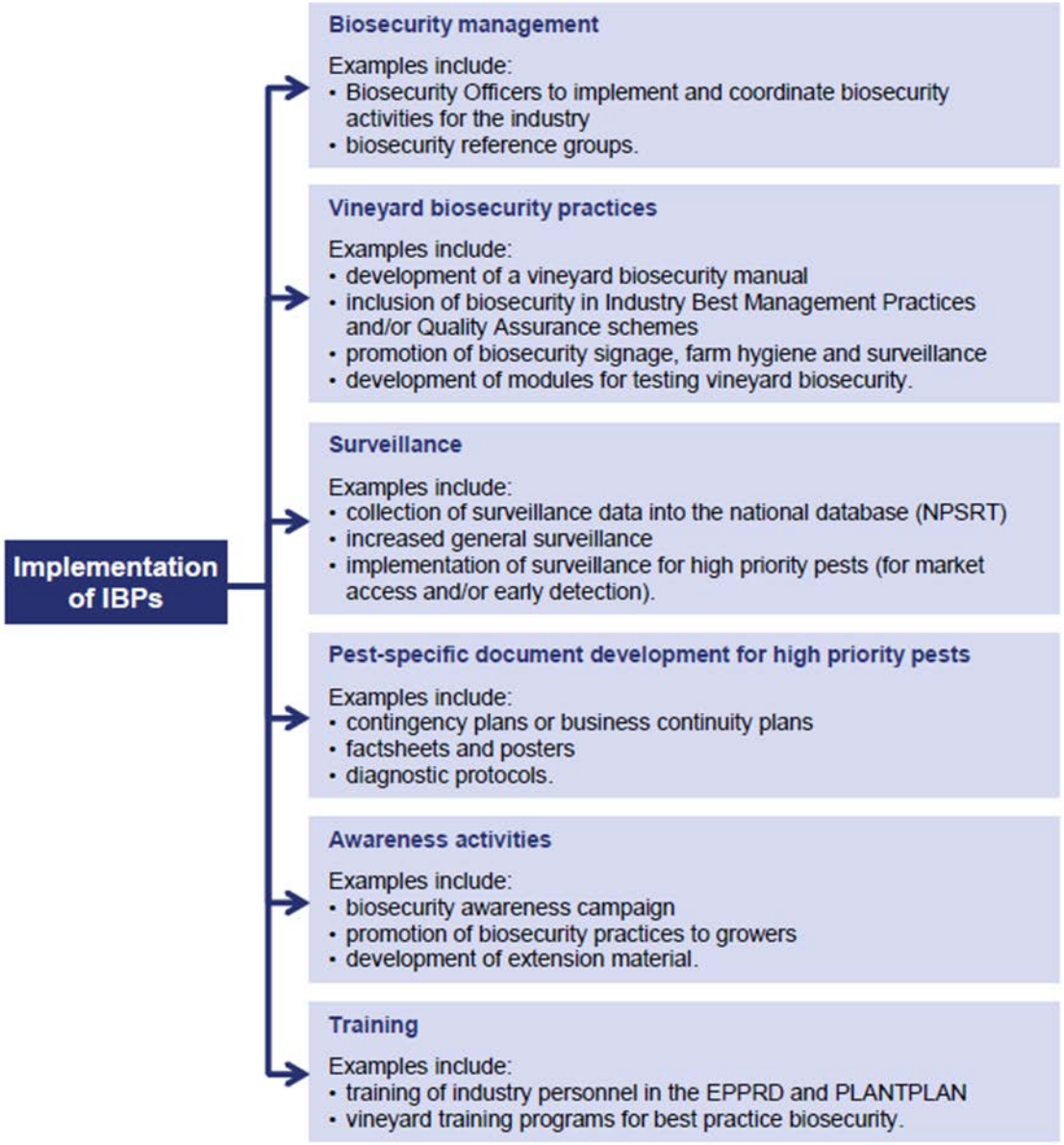

Figure 2 Potential biosecurity implementation activities within the framework of the IBP (taken from Plant Health Australia Ltd (2006) Industry Biosecurity Plan for the Viticulture Industry (Version 3.0-2013). Plant Health Australia, Canberra, ACT.)

Threat identification and pest risk assessment

Introduction

This section identifies the high risk exotic organism threats to the WA viticulture industry, and presents the framework used for assessing the potential risks associated with each threat.

The steps taken for this are summarised in Table 2, which has been modified from the national Industry Biosecurity Plan for the Viticulture Industry (PHA, 2013).

Table 2 Summary of pest risk assessment used (modified from Plant Health Australia Ltd (2006) Industry Biosecurity Plan for the Viticulture Industry (Version 3.0-2013). Plant Health Australia, Canberra, ACT.)

Step 1	Clearly identify the pest	• Generally pest defined to species level • Alternatively a group (family, genus level) can be used • Sub-species level (race) may be required
Step 2	Assess establishment and spread likelihoods	• Assessment based on current systems and factors • Negligible, low, medium, high or unknown ratings
Step 3	Assess likely consequences	• Primarily based on likely economic impact to industry based on current factors and knowledge • Negligible, low, medium, high, extreme or unknown ratings
Step 4	Derive overall risk	• Likelihood of establishment and spread combined with likely consequences to generate an overall risk score • 1-5; non pest to major pest
Step 5	Review the risk	• Risk rating reviewed with industry

Threat identification

Organisms associated with the Australian viticulture were identified as part of a Policy Review for the import of table grapes in to Western Australia — 'Draft policy review: A categorisation of invertebrate and pathogen organisms associated with fresh table grape bunches (*Vitis* spp.) imported from other Australian states and

territories' (DAFWA, 2016). The organisms identified in the Policy Review as exotic to Western Australia were further evaluated in this document.

Information on the biosecurity threats to the viticulture industry described in this document came from a combination of:

- past records
- existing industry protection plans
- relevant experience
- industry practice and experience
- relevant published literature
- local industry and overseas research
- specialist and expert judgment

The organism threats have been split into two tables:

- invertebrates and others (insects, mites, molluscs and avian)
- pathogens (disease causing organisms and nematodes)

Pest risk assessments

The objective of risk assessment is to clearly identify and classify biosecurity risks, and to provide data to assist in the evaluation of these risks. Risk assessment involves consideration of the sources of risk, their consequences, and the likelihood that those consequences may occur. Factors that affect the consequences and likelihood may be identified and addressed via risk mitigation strategies.

Risk assessments may be undertaken to various degrees of refinement, depending on the risk information and data available. Assessment may be qualitative, semi-quantitative, quantitative, or a combination of these. The complexity and cost of assessments increases with the production of more quantitative data. It is often more practical to first obtain a general indication of the level of risk through qualitative risk assessment, and if necessary, undertake more specific quantitative assessments later.

Key questions required for ranking the importance of pests include:

- the probability of establishment and spread in Western Australia, for each pest
- the likely impacts of the pest on cost of production, overall productivity and market access
- how difficult is each pest to identify and manage and/or eradicate

Western Australian Organism List

DPIRD maintains a database on the status of many organisms in relationship to entry into WA — whether they are permitted or prohibited — called the Western Australian Organisms List (WAOL). Organisms that are not listed in WAOL are automatically prohibited entry into WA. The current WAOL listing when this document was produced is included in the lists of potential exotic threats. A summary of what the WAOL codes mean is included in Table 3.

Table 3 Western Australian Organism List codes and meanings

code	meaning
Legal entry status	
Prohibited – s12	Prohibited organisms are declared pests by virtue of section 22(1), and may only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Declared Pest – s22(2)	Declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia.
Permitted – s11	Permitted organisms must satisfy any applicable import requirements when imported. They may be subject to an import permit if they are potential carriers of high-risk organisms.
Unlisted – s14	If you are considering importing an unlisted organism/s you will need to submit the name/s for assessment, as unlisted organisms are automatically prohibited entry into WA.
Permitted – r73	Regulation 73 permitted organisms may only be imported subject to an import permit. These organisms may be subject to restriction under legislation other than the *Biosecurity and Agriculture Management Act 2007*. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Control categories	
C1	Exclusion - Organisms which should be excluded from part or all of Western Australia.
C2	Eradication - Organisms which should be eradicated from part or all of Western Australia.
C3	Management - Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism.
Unassigned	Declared pests that are recognised as having a harmful impact under certain circumstances, where their subsequent control requirements are determined by a Plan or other legislative arrangements under the Act.

Establishment potential

This document does not consider potential pathways by which a pest might enter Western Australia. This is a broader view of potential risk than a Pest Risk Analysis (PRA) for an import request which focus on specific regulated import pathways. For the purposes of this document, it is assumed that the exotic organism has found its way onto a grapevine in WA. The establishment potential is then assessed on the likelihood that the organism will be able to survive and multiply under WA conditions. The codes and definitions for the assessment of establishment potential are listed in Table 4.

Table 4 Ratings and definitions used to determine the establishment potential of exotic pest threats to the WA viticulture industries

Establishment potential	Definition
Negligible	The pest has limited potential to survive and become established within Western Australia given the combination of all known factors.
Low	The pest has the potential to survive and become established in approximately one- third or less of the range of hosts. The pest could have a low probability of contact with susceptible hosts.
Medium	The pest has the potential to survive and become established in between approximately one-third and two-thirds of the range of hosts.
High	The pest has potential to survive and become established throughout most or all of the range of hosts. Distribution is not limited by environmental conditions that prevail in Western Australia. Based upon its current world distribution, and known conditions of survival, it is likely to survive in Western Australia wherever major hosts are grown.
Unknown	The establishment potential of the pest is unknown or very little of value is known.

Spread potential

The spread potential assesses the climatic adaptability of the organism, the natural movement capacity, ease of assisted spread and whether normal industry practices would limit its spread. The assessment takes into account that ‘Best Industry Biosecurity Practices’ may not be universally observed within the industry at all times. The codes and definitions for the assessment of spread potential are listed in Table 5.

Table 5 Ratings and definitions used to determine the spread potential of exotic pest threats to the WA viticulture industries

Spread potential	Definition
Negligible	The pest has very limited potential for spread in Western Australia given the combination of dispersal mechanisms, availability of hosts, vector presence, industry practices and geographic and climatic barriers.
Low	The pest has the potential for natural or assisted spread to susceptible hosts within Western Australia yet is hindered by a number of the above factors.
Medium	The pest has an increased likelihood of spread due to the above factors.
High	The natural spread of the pest to most production areas is largely unhindered and assisted spread within Western Australia is also difficult to manage.
Unknown	The spread potential is unknown or very little of value is known.

Economic impact

The economic impact assessment takes into account the impact on yields, plant health, production costs and markets that the establishment of the exotic organism would have on the viticulture industry. This includes any potential management difficulties and any potential associated issues, such as virus vectoring. The codes and definitions for the assessment of economic impact are listed in Table 6.

Table 6 Ratings and definitions used to determine the economic impact of exotic pest threats to the WA viticulture industries

Economic impact	Definition
Negligible	There is no impact on yield, host longevity, production costs, storage, or market access.
Low	There is minor impact on standing crop, stored product or market access.
Medium	There is moderate impact on crops, but host mortality is rare, and storage losses and/or moderate impacts on market access may occur.
High	There is severe impact on standing crop, with significant host mortality and/or storage losses and/or severe impacts on market access.
Extreme	There is extreme impact on standing crop, with extreme host mortality and/or storage losses and/or extreme impacts on market access.
Unknown	The economic potential of the pest is unknown or very little of value is known.

Overall final industry pest risk

The final industry pest risk assessment is a combination of the establishment, spread and economic impact evaluations, with consideration for management complexities and general industry concern. The codes and definitions for the final industry rating are listed in Table 7.

Table 7 Ratings and definitions used to determine the overall pest risk rating of exotic pest threats to the WA viticulture industries

Overall pest risk	Definition
1	Pest that is expected to cause negligible impact.
2	Pest that will cause minor impact.
3	Pest that will cause moderate impact, but not likely to become a serious problem over wide areas due to either low likelihood of establishment or spread, or is likely to be controlled in the normal course of management of currently existing pests.
4	Pest that will cause moderate to significant impact and is likely to spread over wider areas, but should be able to be managed effectively with moderate changes/additions to current management practices.
5	Pest that will cause significant damage and is likely to spread over wider areas and will be difficult to manage or require significant new management practices.

Potential pest threats assessment summaries

Pests may threaten multiple industries, which may impact on the establishment and spread potential and is taken into consideration during these stages. The economic impact only considers the viticulture industries of Western Australia, and the final industry pest risk the WA viticulture industry concerns. Therefore the final overall industry pest risk rating in this document may differ for different industries.

The list of potential pest threats (PPT) to the Western Australian viticulture industry, of pests already established in other states and territories of Australia, including summarised information on establishment and spread potential, potential economic consequence, and final industry pest rating, is available in Table 8 and 9. The highest ranked threats — those with a final industry pest rating of 4 or 5, from the PPT as identified through the process of risk assessment, are listed in the High Priority Pests list (Table 1) in the opening summary.

Table 8 List of potential exotic threats to the Western Australian viticulture industries and evaluation summaries — invertebrates and others (insects, mites, molluscs and avian)

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Acizzia sp. plant lice / psyllid	**High/Low:** *Acizzia* spp. Have successfully populated many areas of the world and there are some *Acizzia* spp. permitted in WA (*A. credoensis, A. veski)*. Spread would most likely require assistance.	**Low:** Psyllid's that are foliage feeders (Hollis, 2002). While numbers can proliferate, they are not considered a significant pest.	2
Acosmeryx anceus Stoll, 1871 sphingid moth Prohibited – s12 (C1)	**Low/Low:** Mainly found in tropical locations. Potential issue for Carnarvon.	**Low:** Larvae are known to infest grapes, but a scarcity of reports suggest low pest issue	2
Adelium tenebrioides Erichson, 1842 darkling beetle Permitted – s11	**Unknown**	**Unknown:** Only a single record of association with grapevines (Plant Health Australia, 2011), therefore unlikely to be a pest.	2
Aethina concolor Macleay hibiscus flower beetle Unlisted (s14)	**Unknown**	**Unknown:** very few reports associated with grapevines so appears not to be a significant concern.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Agarista agricola Donovan, 1805 painted vine moth Prohibited – s12 (C1)	**Medium/Medium:** Found up and down eastern Australia, so tolerate a wide climatic variability, though may not prefer the cool conditions of the south west.	**Medium:** Larvae feed on foliage of the Vitaceae family including *Vitis* spp. Can do some damage in large numbers.	3
Agrypnus sp. click beetle / wireworm	**High/High:** Various *Agrypnus* spp. occur in WA.	**Unknown:** Only a single record of association with grapevines (Plant Health Australia, 2011), therefore unlikely to be an issue for grapevines.	2
Aleurocanthus spiniferus Quaintance, 1903 Syn: *Aleurodes citricola* Syn: *Aleurodes spiniferus* orange spiny whitefly Prohibited – s12 (C1)	**High/Medium:** Has established in a range of climates across the world (Gyeltshen, et al., 2010). Multiple likely hosts grown in WA.	**Medium:** Mainly a citrus pest, but is known to attack grapevines (Cioffi, et al., 2013; Gyeltshen, et al., 2010), can cause general weakening of the vine, but mainly an issue due to production of honeydew.	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Aleurodicus dispersus Russell, 1965 spiraling whitefly Prohibited – s12 (C1)	**Medium/Medium:** Although more a tropical pest, it has shown a capacity to spread to the sub-tropics and temperate regions (Department of Agriculture and Fisheries, Queensland Government, 2016). Active between 12-33°C, however there is significant mortality below 10°C (CABI, 2016).	**Medium:** Is reported to infest grapevines, but seems to favour tropical crops. Can cause general weakening of the vine, but mainly an issue due to production of honeydew (Department of Agriculture and Fisheries, Queensland Government, 2016).	3
Amblydromella applegum Schicha, 1983 predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol insect, non pest of grapevines.	1
Amblydromella brisbanensis Schicha, 1983 predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol insect, non pest of grapevines.	1
Amblyseius herbicolus Chant, 1959 predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol insect, non pest of grapevines.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Amblyseius sturti predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol insect, non pest of grapevines.	1
Amblyseius waltersi Schicha, 1981 predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol insect, non pest of grapevines.	1
Ambrosiodmus rubricollis Wood & Bright, 1992 bark beetle Prohibited – s12 (C1)	**High/High:** Has established in temperate and Mediterranean regions of Europe (GBIF Secreteriat, 2016).	**Unknown:** Wood borer insect that can cultivate fungi in the sapwood of hosts. Polyphagous, but not sure of occurrence in grapevines. Not noted to be an aggressive species (GBIF Secreteriat, 2016), so unlikely to be a serious pest.	2
Ametastegia (Ametastegia) glabrata Fallen, 1808 Syn: *Tenthredo glabrata* dock sawfly / holoartic sawfly Prohibited – s12 (C1)	**High/High:** Widely recorded in temperate and Mediterranean regions of Europe (Malipatil, et al., 1995), main host dock (*Rumex obtusifolius*) is widespread.	**Low:** Grapevines are not a primary host, but can be infested for pupating. Will pupate in apples and berry canes also (Malipatil, et al., 1995). Not considered a serious pest of grapevines.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Anagyrus fusciventris Girault, 1915 parasitic wasp Unlisted (s14)	**Medium/Low:** *A. fusciventris* parasitises long-tailed mealybug (Furness & Charles, 2010) which can be found in sheltered positions such as grape bunches.	**Negligible:** *A. fusciventris* is a biocontrol agent (Furness & Charles, 2010).	1
Anoplognathus velutinus Boisduval, 1835 Christmas beetle Unlisted (s14)	**High/High:** There are various species of *Anoplognathus* found across Australia, including many permitted in WA. *A. velutinus* is found from Brisbane around to Adelaide (NCRIS, 2016).	**Low:** Larvae inhabit the soil, the adults mainly feed on foliage (Carne, 1957), though there have been reports of *Anoplognathus* spp. feeding on plum fruit (Hely, et al., 1982). Reports of damage to grapevines are scarce, so unlikely a serious pest.	2
Aploneura ampelina Mokrzecky, 1896 Unlisted (s14)	**Unknown:** Related species *A. lenrisci* is permitted in WA.	**Low:** Root feeding aphid (Blackman & Eastop, 2000) could be confused with Grapevine phylloxera. Scarcity of reports suggests low pest status.	2
Apogonia sp. scarab beetle Unlisted (s14)	**Unknown**	**Low:** Mostly leaf feeders (Brown, et al., 2000). There are minimal reports of damage, suggesting they are not a serious pest.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Arcte coerula Guenee, 1852 ramie moth / fruit piercing moth Prohibited – s12 (C1)	**Low/Low:** Considered to be a tropical pest, currently only found in Queensland in Australia (Herbison-Evan & Crossley, 2016).	**Low:** Have been reported in association with grape berries (Verhagen, et al., 2009), but is considered a tropical pest. The scarcity of pest reports suggests this is unlikely to be a pest issue.	2
Argyrolepidia subaspersa (Walker) Prohibited – s12 (C1)	**Unknown**	**Unknown:** The paucity of available literature on *A. subaspersa* indicates a non-pestiferous nature.	1
Arsipoda chrysis Oliver, 1808 flea beetle Unlisted (s14)	**Unknown**	**Low:** Adults reported to feed on leaves (Department of the Environment and Heritage, Australian Government, 2011). Very little information available. A lack of damage reports suggests a non-pest nature.	2
Artena dotata Fabricius, 1794 fruit piercing moth Unlisted (s14)	**Unknown**	**Low:** Adults known to attack grape berries, but there is very little reports of damage from Australia on grapevines. Therefore unlikely to be a serious pest.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Asteropetes noctuina butler, 1878 Unlisted (s14)	**Medium/Medium:** Native to Japan, likely to survive South-west WA conditions.	**Low:** Larvae feed on leaves, reported to infest grapevines in Korea and Japan, is a US listed quarantine pest, not reported in bunches. The limited number of pest reports suggests this is unlikely to be a pest issue.	2
Attagenus unicolor Brahm, 1791 black carpet beetle Unlisted (s14)	**Unknown**	**Low:** Pest of stored product and carpets. Could potentially cause an issue for dried grape production, but generally would not be considered a pest of grapevines.	2
Australopsylla sp. Unlisted (s14)	**Unknown**	**Unknown:** Only the one record of association with grapevines (Plant Health Australia, 2001), so unlikely a pest of grapevines.	1
Axionicus insignis Pascoe, 1869 kurrajong weevil Unlisted (s14)	**Unknown**	**Negligible:** Mainly a pest of kurrajong trees, and usually only attacks unhealthy trees, so unlikely to be a serious pest of grapevines.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Bactrocera (Bactrocera) neohumeralis Hardy, 1951 Syn: *Chaetodacus humeralis* lesser Queensland fruit fly Prohibited – s12 (C1)	**Medium/Medium:** Host plants listed (CABI, 2016) are present in WA, though limited to suitable climatic regions.	**Medium:** Only a single record of association with grapes (May, 1960). Does not seem to favour grapes. Could pose a Quarantine issue for export of table grapes.	3
Bactrocera tryoni (Froggatt, 1897) Syn: *Chaetodacus tryon* Syn: *Dacus tryoni* Queensland fruit fly Prohibited – s12 (C1)	**High/High:** Host plants (Hancock, et al., 2000) are present in WA. Has established readily in similar climates in East coast.	**Extreme:** *B. tryoni* is the most serious insect pest of fruit and vegetable crops in Australia (White & Hancock, 1997). Listed as a major pest of table grapes (Oag, 2001) and can cause high levels of damage to wine grapes (Loch, 2008)	5
Blastopsylla sp.	**Unknown:** Two related species – *B. nigricollaris* and *B. occidentalis* are permitted in WA.	**Low:** Foliage feeder (Hollis, 2002). Very few reports of association with grapevines, therefore unlikely to be an issue.	2
Caedicia sp. longhorned grasshopper	**Unknown:** Two related species – *C. extenuata* and *C. simplex* are permitted in WA.	**Low:** Nymphs and adults feed on the leaves (Furness, 2010). Very few reports of association with grapevines, therefore unlikely to be an issue.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Calyptra lata Butler, 1881 fruit piercing moth / larger orasia Prohibited – s12 (C1)	**Unknown**	**Low:** Citrus is the main host, but a range of other fruits are attacked including grapes. Adults do the damage, larvae are not a pest. Reported to feed on Raspberries and cherries in Russia (Zaspel, et al., 2016). Minimal reports of damage to grapes, therefore unlikely to be a serious pest.	2
Calyptra thalictri Borkhausen, 1790 fruit piercing moth Prohibited – s12 (C1)	**Unknown**	**Low:** A range of fruits are attacked including grapes. Adults do the damage, larvae are not a pest. Minimal reports of damage to grapes, therefore unlikely to be a serious pest.	2
Chlorophorus annularis Fabricius, 1787 Syn: *Callidium annulare* Syn: *Caloclytus annularis* bamboo longicorn beetle Prohibited – s12 (C1)	**Unknown**	**Low:** Larvae attack roots, mainly bamboo, while adults feed on flowers, scarcity of reports on damage to grapevines, so unlikely to be a serious pest	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Chrysomphalus dictyospermi (Morgan, 1889) Syn: *Aspidiotus (Chrysomphalus) dictyospermi* Spanish red scale Prohibited – s12 (C1)	**High/Medium:** Multiple host plants (Miller & Davidson, 2005) are grown in WA.	**Low:** Is of economic importance to several hosts and a serious pest of citrus (Miller & Davidson, 2005). Seems to be a lesser pest of grapevines. Scales are generally a minor pest of grapevines.	2
Chrysopa sp. green lacewing	**Medium/Medium:** Several *Chrysopa* spp. are currently present in WA.	**Negligible:** *Chrysopa* spp. are biocontrol agents (Furness & Charles, 2010), so therefore not pestiferous.	1
Chrysoperla sp. green lacewing Unlisted (s14)	**Unknown**	**Negligible:** Many species of the genus *Chrysoperla* are important biological control agents (Pappas, et al., 2011), so they are beneficial organisms.	1
Colaspoides foveiventris Lea, 1915 lucerne leaf-eating beetle Prohibited – s12 (C1)	**Unknown**	**Negligible:** Only a single record associated with *Vitis* spp. Therefore unlikely to be a serious pest for grapevines.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Colaspoides picticornis Lea, 1915 Unlisted (s14)	**Unknown**	**Negligible:** Only two records associated with *Vitis* spp. Scarcity of any pest reports. Therefore unlikely to be a serious pest of grapevines.	1
Colgar peracutum Walker, 1858 citrus planthopper Prohibited – s12 (C1)	**High/Medium:** *C. peracutum* are noted to feed on citrus, grape, potato and other plants (Smith, et al., 1997)that are grown in WA.	**Low:** *C. peracutim* can damage fruit (Smith, et al., 1997) and have been reported to infest *Vitis* spp., but citrus remain the primary host. Atlas of living Australia list this as only affecting leaves, twigs and branches and of low economic impact.	2
Conoderus sp. wireworm	**Unknown:** Several species of *Conoderus* are declared pest in WA and listed as prohibited.	**Negligible:** Only a single record of association with *Vitis* spp., so unlikely to be a serious pest of grapevines.	1
Corticaria japonica Reitter, 1877 Syn: *Corticaria adelaidae* minute mould beetle Permitted – s11	**Unknown**	**Low:** Feed on decaying plant material (Biosecurity Australia, 2006). There is a low possibility of these being a pest of dried grapes.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Cryptolestes pusillus (Schönherr, 1817) Syn: *Cucujus minutus* flat grain beetle Declared pest – s22 (C3)	**High/High:** *Cryptolestes pusillus* is ubiquitous and will feed on dried plant material, either in storage or occurring naturally.	**Low:** *Cryptolestes pusillus* is a pest of stored cereal grains (White, et al., 1995) and processed commodities (Jagadeesan, et al., 2013). Potentially a pest of dried grapes only.	2
Daktulosphaira vitifoliae (Fitch, 1855) Syn: *Daktulosphaera vitifoliae* Syn: *Pemphigus vitifoliae* grape phylloxera Prohibited – s12 (C1)	**High/Medium:** *Vitis vinifera* is the sole host for *D. vitifoliae* (Buchanan, et al., 2010). Grape phylloxera is introduced into new areas on grapevine material, soil, machinery, and people movements. Once in a vineyard it cannot be successfully removed (Vinehealth Australia, 2016).	**Extreme:** *D. vitifoliae* is often listed as the world's worst grape pest (Buchanan, et al., 2010). While many table grapevines might be grown on resistant rootstocks, most wine grapevines, including valuable heritage vines, are not, and would be highly susceptible to grape phylloxera and require replacement.	5
Diaspidiotus ancylus Putman, 1878 Syn: *Abgrallaspis comstocki* Syn: *Aspidiella comstocki* putnam scale Prohibited – s12 (C1)	**High/Medium:** Various hosts such as *Vitis* spp. and blueberries are grown in WA.	**Medium:** This species is not associated with grape bunches, but can cause sooty mould to cover stems and leaves. In large numbers could potentially reduce vine vigour. However the similar armoured San Jose scale is generally considered of only a minor significance. Putnam scale is a quarantine issue for export to Vietnam.	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Diadiplosis koebelei Koebele,1893 Unlisted (s14)	**Medium/Medium:** *D. koebelei* parasitises long-tailed mealybugs (Furness & Charles, 2010), a pest with an extensive host range and is present in WA.	**Negligible:** *D. koebelei* is a biological control agent (Furness & Charles, 2010).	1
Diaspis boisduvalii Signoret, 1869 orchid scale Prohibited – s12 (C1)	**Unknown**	**Low:** Important pest of orchid plants (Espinosa, et al., 2010). Very little information of association with *Vitis* spp therefore unlikely to be a serious pest.	2
Dieuches maculicollis Walker, 1872 Syn: *Dieuches atricornis* Unlisted (s14)	**Unknown**	**Low:** Ground dwelling, associated with grapevines (ABRS, 2009), but very few reports found listing it as an issue, so unlikely to be a serious pest of grapevines.	2
Didymocantha obliqua Newman, 1840 slender grey longicorn Unlisted (s14)	**Unknown**	**Low:** Adults feed on flowers and foliage, larvae bore into stems (Lawrence & Britton, 1991) but very few report found listing it as an issue, so unlikely to be a serious pest of grapevines.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Diphucephala colaspidoides Gyllenhal, 1817 Syn: *Diphucephala lineatocollis* Syn: *Melolontha colaspidoides* green scarab beetle / cherry green beetle Prohibited – s12 (C1)	**Unknown**	**Low:** Larvae feed in soil in moist heath lands. Adults swarm in large numbers and feed on foliage (Hely, et al., 1982), but very few reports of damage to grapevines, so unlikely to be a serious pest.	2
Diphucephala nigritarsis Lea, 1917 green scarab beetle Unlisted (s14)	**Unknown**	**Low:** Larvae feed in soil in moist heath lands. Adults swarm in large numbers and feed on foliage (Hely, et al., 1982), but very few reports of damage to grapevines, so unlikely to be a serious pest.	2
Diphucephala nitidicollis Macleay, 1886 green scarab beetle Prohibited – s12 (C1)	**Unknown**	**Low:** Larvae feed in soil in moist heath lands. Adults swarm in large numbers and feed on foliage (Hely, et al., 1982), but very few reports of damage to grapevines, so unlikely to be a serious pest.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Diphucephala pulchella Waterhouse, 1837 green scarab beetle Unlisted (s14)	**Unknown**	**Low:** Larvae feed in soil in moist heath lands. Adults swarm in large numbers and feed on foliage (Hely, et al., 1982), but very few reports of damage to grapevines, so unlikely to be a serious pest.	2
Dolichogenidea tasmanica (Cameron, 1912) *(Apanteles tasmanicus)* parasitic wasp Unlisted (s14)	**Medium/Low:** *D. tasmanica* as a biocontrol agent for Light brown apple moth (Bailey & Furness, 2010), a pest present in WA.	**Negligible:** *D. tasmanica* is a biocontrol agent (Bailey & Furness, 2010).	1
Dryocoetiops coffeae Eggers, 1923 bark beetle Unlisted (s14)	**Unknown**	**Low:** Associated with woody plant products, but few reports on grapevines, suggesting low impact.	2
Duplaspidiotus claviger Cockerell, 1901 dupla scale / camelia mining scale Prohibited – s12 (C1)	**High/Medium:** Preferred hosts hibiscus, gardenia, jasmine and camellia are widely grown in WA.	**Low:** Associated with the woody portions of grapevines (Brimblecombe, 1962), but *Vitis* spp. do not appear to be a preferred host. Scarcity of reports on *Vitis* spp. suggests this not to be a significant pest.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Dysgonia arctotaenia Guenee, 1852 Syn: *Parallelia arctotaenia* fruit piercing moth Prohibited – s12 (C1)	**Medium/Medium:** Host plants grown, but spread down to the south west likely to be limited.	**Low:** Adults are a fruit piercing moth and can attack grape berries. Native to South East Asia, endemic to NSW, Qld & NT (Herbison-Evan & Crossley, 2016), so likely a sub-tropical pest. Very few reports of significant damage to *Vitis*, so unlikely a major issue.	3
Echiomima sp. vine borer moth Unlisted (s14)	**High/High:** Host and climate suitable in WA. Damage region has been increasing in the Eastern states, so the moth is relatively mobile.	**High:** Larvae are known to tunnel into canes and spurs of grapevines. A noted issue in the Riverina where they have been reported to damage spurs and buds resulting in up to 43% reduction in yield on Merlot in some cases (Dunn & Zurbo, 2014). Also recorded in Riverland, Hunter Valley and Queensland grape districts. Difficult to manage.	5
Echnolagria sp. Unlisted (s14)	**Unknown**	**Negligible:** Only a single record of association with *Vitis* spp., therefore unlikely to be an issue with grapevines.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Ecrizothis inaequalis Blackburn, 1899 gooseberry weevil Prohibited – s12 (C1)	**Medium/medium:** Recorded feeding on apple, cherry and gooseberry. Flightless adults, so distant movement by assisted transport only, on infested plant material or in soil.	**Low:** Adults feed on foliage and buds (Kerruish, 1997). A scarcity of reports of damage to grapevines, suggest this to be a low pest issue.	2
Ecrizothis boviei Lea, 1911 native weevil Unlisted (s14)	**Medium/Medium:** Recorded feeding on apple and grapevines, found in the Yarra Valley. Flightless adults so distant movement by assisted transport only, on infested plant material or in soil.	**High:** Adults feed on foliage and buds. Recorded to have become a pest of grapevines in the Yarra Valley causing significant damage in two cases. Found to affect chardonnay, pinot noir and pinot meunier (Cole, 2006) and can cause significant yield losses due to bud damage. Difficult to manage.	4
Ephippitytha maculate Evans, 1847 bush katydid Unlisted (s14)	**Unknown:** Two related species – *E. trigintiduoguttata* and *E. sparsa* are present in WA.	**Unknown:** The absence of available literature on *E. maculate* indicates a non-pestiferous nature.	1
Eristalinus (Lathyrophthalmus) aeneus Scopoli, 1763 hover fly Unlisted (s14)	**Unknown**	**Negligible:** Syrphidae adults are pollen and nectar feeders and can be pollinators of major significance. Most Eristalinae are saprophagous (Evenhuis, 1989).	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Euproctis paradoxa Butler, 1886 Syn: *Chionophasma paradoxa* Syn: *Porthesia paradoxa* tropical yellow tail moth / native tussock moth Prohibited – s12 (C1)	**High/High:** *E. paradoxa* host plants such as avocado, grape, nectarine, peach and radiata pine (Poole, et al., 2011) are grown extensively in WA. Being a moth they can travel reasonable distances.	**Medium:** *E. paradoxa* can feed on the stalks of ripening grapes and cause heavy fruit fall (Hely, et al., 1982). Their native host is black wattle (*Acacia leiocalyx*).	4
Geococcus coffeae Green, 1933 coffee root mealybug Prohibited – s12 (C1)	**Unknown**	**Low:** Attacks the roots of host plants. Very few reports associated with grapevines, so unlikely to be a pest of grapevines.	2
Geoica lucifuga Zehntner, 1897 sugarcane root aphid Unlisted (s14)	**High/Medium:** Is reported to have established in SA, NSW and Tasmania (CSIRO, 2004).	**Low:** Attacks the roots of host plants (Blackman & Eastop, 2000). There are reports of this pest infesting grapevines. Scarcity of reports listing this as an issue for grapevines, suggests it is a low pest issue.	2
Hypothenemus eruditus Westwood, 1836 shot-hole wood borer Prohibited – s12 (C1)	**Unknown**	**Low:** Associated with woody plant products. Reported in NSW, but don't seem to be an issue on grapevines.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Hypurus bertrandi Perris, 1852 portulaca leaf-mining weevil Unlisted (s14)	**Unknown**	**Negligible:** No evidence of an association with *Vitis* spp. Therefore this should not be an issue for grapevines.	2
Ischyja manlia Cramer, 1776 fruit piercing moth Unlisted (s14)	**Unknown**	**Low:** Reported to attack grape berries, but does not seem to have become an issue.	2
Leptopius robustus Oliver, 1807 fruit tree root weevil Prohibited – s12 (C1)	**Unknown**	**Low:** Generally associated with weakened plants, adults feed on leaves, larvae feed on roots. Limited reports associated with grapevines, suggesting this is not an issue.	2
Leptopius squalidus fruit tree root weevil Prohibited – s12 (C1)	**Unknown**	**Low:** Adults feed on leaves and larvae feed on roots (Hely, et al., 1982). Limited reports associated with grapevines, suggest this to be a minor issue.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Lopholeucaspis japonica Cockerell, 1897 Syn: *Leucaspis hydrangea* Syn: *Leucaspis japonica* Japanese baton scale / pear white scale Prohibited – s12 (C1)	**Medium/Medium:** Primary hosts Pear and citrus are grown in WA. Early 1900's reports, no recent records.	**Low:** Associated with damage to leaves and bark of host plants (Plantwise, 2016). Considered to have a low economic impact on apples and pears, so also likely to have only a low economic impact on grapevines.	3
Mandalotus sp. madalotus weevil Unlisted (s14)	**Low/Low:** Suitable hosts (particularly canola) are grown in WA. Other *Mandalotus* spp. have been reported in WA (ALA, 2016). This is a flightless weevil so distant distribution is by movement of infested plant material or soil.	**Low:** Adults feed on leaves and larvae feed on roots (CESAR-Consultants, 2007). More of an issue for canola crops. Limited reports associated with grapevines, suggest this to be a minor issue.	2
Melampsalta sp. black cicada Unlisted (s14)	**Unknown**	**Low:** Damage to woody parts by oviposition (Greenup, 1967). Limited reports associated with grapevines, so unlikely to be an issue.	2
Metaphycus lounsburyi Howard, 1898 parasitic wasp Permitted – s11	**Unknown**	**Negligible:** *M.lounsburyi* parasitise Grapevine scale (*Parthenolecanium persicae persicae*), therefore this is a biocontrol agent and not a pest.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Misumena sp. crab spider Unlisted (s14)	**Unknown**	**Negligible:** Spiders in this genus are predators not plant pests (DAFF, 2013).	1
Monolepta divisa Blackburn, 1888 small monolepta beetle Prohibited – s12 (C1)	**High/High:** Reported to occur in NSW, Vic, SA (ALA, 2016).	**Medium:** Swarming beetles feed on young foliage and green fruit (Hely, et al., 1982). Scarcity of reports of causing damage to grapevines suggests likely a low issue. But it is a quarantine pest for grapes into New Zealand.	3
Neoseiulus loxtoni Schicha, 1979 Syn: *Amblyseius loxtoni* predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol organism, therefore not a pest.	1
Neoseiulus noosae McMurtry & Schicha, 1987 predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol organism, therefore not a pest.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Neoseiulus thwaitei Schicha, 1977 predatory mite Unlisted (s14)	**Unknown**	**Negligible:** Biocontrol organism, therefore not a pest.	1
Notiosomus sp. Unlisted (s14)	**Unknown**	**Negligible:** Only a single report with association to *Vitis* spp. Therefore unlikely a pest issue.	1
Oligonychus punicae Hirst, 1926 Syn: *Hirstiella punicae* Syn: *Paratetranychus punicae* avocado brown mite Prohibited – s12 (C1)	**High/Medium:** Primary host avocado grown extensively.	**Low:** Feed on leaves. Has a strong association with grapevines and can cause delay to ripening. Has a low economic impact rating on avocado (ALA, 2016), likely to be the same for grape vines. Other leaf feeding mites currently present are not a serious issue on grapevines.	3
Oraesia emarginata Fabricius, 1794 fruit piercing moth / smaller oraesia Prohibited – s12 (C1)	**Medium/Medium:** Primary host citrus, peach, lesser host apples, grape vines.	**Low:** Nocturnal activity, reports suggest some association with grapes. Scarcity of reports of significant damage suggests this likely of a low economic importance.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Orthorhinus klugii Boheman, 1835 vine weevil Prohibited – s12 (C1)	**High/Medium:** Reported to occur in Victoria and SA (ALA, 2016). Has a wide host range, but is flightless so distant distribution only by movement of infested plant material or soil.	**Low:** Attacks woody parts (Hely, et al., 1982). While associated with grapevines there is a scarcity of reports of any significant damage to grapevines.	2
Oryzaephilus surinamensis Linnaeus, 1758 saw toothed grain beetle Declared pest – s22 (C3)	**High/Medium:** Attacks stored grain.	**Low:** Reported to be a pest of dried sultana production (Buchanan, et al., 1984). Unlikely to be an issue elsewhere.	3
Otiorhynchus rugosostriatus Goeze, 1777 Syn: *Curculio rugosostriatus* rough strawberry weevil Prohibited – s12 (C1)	**High/Medium:** Related to apple weevil (*Otiorhynchus cribicollis*) that is well established. Has a wide host range, but is flightless so distant distribution only by movement of infested plant material or soil.	**Low:** Larvae feed on roots and adults feed on leaves and are nocturnal (Biosecurity Australia, 2005). Limited reports of association with grapevines, suggests a minor issue.	2
Otiorhynchus sulcatus Fabricius, 1775 Syn: *Brachyrhinus sulcatus* Syn: *Curculio sulcatus* black vine weevil Prohibited – s12 (C1)	**High/Medium:** Related to apple weevil (*Otiorhynchus cribicollis*) that is well established. Has a wide host range, but is flightless so distant distribution only by movement of infested plant material or soil.	**Medium:** Adults nocturnally feed on buds, foliage, flowers and young fruit, while larvae feed on roots (University of California, 2016) (Kerruish, 1997). Reports suggest this can be an issue for young vines, otherwise sporadic.	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Ozoliarus pitta Löcker, 2006 cixiid planthopper *Unlisted (s14)*	**Medium/Medium:** Both table and wine grapes are grown extensively in WA.	**Negligible:** The absence of available literature on *O. pitta* indicates a non-pestiferous nature.	1
Panonychus citri McGregor, 1916 Syn: *Metatetranychus citri* Syn: *Paratetranychus citri* citrus red mite Prohibited – s12 (C1)	**High/Medium:** Related to European red mite, that has become established.	**Low:** Damage to leaves and is associated with grapevines (Plantwise, 2016). It is related to *P ulmi*, European red mite, and can have resistance issues. Other leaf mites have not normally created a significant issue for grapevines.	3
Parlatoria camelliae Comstock, 1883 camellia parlatoria scale Prohibited – s12 (C1)	**Unknown**	**Low:** Infests the leaves of host plants (Miller & Davidson, 2005). Reports suggest this is unlikely to be an issue on grapevines.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Parthenolecanium corni Bouché, 1844 Syn: *Coccus rosarum* Syn: *Eulacanium adenostomae* European fruit lecanium scale / plum scale Prohibited – s12 (C1)	**High/Medium:** *P. corni* is highly polyphagous with host plants in at least 40 families (Plantwise, 2016) many of which are present in Western Australia.	**High:** 'Infestations of *P. corni* result in reduced vigour and general debility of the host plant. Heavy infestations may result in chlorotic spotting and premature shedding of leaves, wilting and dieback of stems. Honeydew deposited on the leaves and fruit serves as a medium for the growth of black sooty moulds. The sooty mould results in a reduction of photosynthetic area and lowers the market value of ornamental plants and plant produce' (Plantwise, 2016). On the whole, scales have not posed a significant economic impact for grapevines. However *P. corni* is reported to be capable of transmission of Grapevine leafroll-associated viruses (Sforza, et al., 2003), the final rating takes this into account.	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Perperus innocuus Boheman, 1842 Syn: *Centyres delens* Syn: *Pantopoeus cervinus* broad-backed vine weevil / apple root weevil Prohibited – s12 (C1)	**Unknown**	**Low:** Adults noted to feed on buds and foliage while larvae live in the soil (Hely, et al., 1982). Scarcity of reports of significant damage to grapevines.	2
Perperus lateralis Boisduval, 1835 Syn: *Coptorhynchus lateralis* Syn: *Otiorhynchus lateralis* white striped weevil Prohibited – s12 (C1)	**Unknown**	**Low:** Adults noted to feed on buds and foliage while larvae live in the soil (Hely, et al., 1982). Scarcity of reports of significant damage to grapevines.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Phenacoccus aceris Signoret, 1875 Syn: *Dactylopius vagabundus* apple mealybug Prohibited – s12 (C1)	**High/Medium:** Broad host range includes apples, pears, cherry, plum, grapes and blueberry which are grown near wine regions.	**Medium:** Infestations may result in reduced vigour of the host plant. Honeydew deposited on the leaves, stems and fruit can lead to the growth of black sooty moulds. The sooty mould results in a reduction of photosynthetic area and lowers the value of produce. Likely no worse than currently present mealybugs. However is reported to be capable of transmission of Grapevine leafroll-associated viruses (Le Maguet, et al., 2012).	4
Philonthus sp. Stephens, 1829 rove beetle Unlisted (s14)	**High/High:** *Philonthus* spp have been introduced to Australia by exported commodities and established (Moore, 1968).	**Negligible:** Most Staphylinidae live in decomposing plant and/or animal matter. Most adults are predators some are parasitoids of other insects (Hangay & Zborowski, 2010).	1
Phyllotocus sp.	**Medium/Medium:** Previous reports of *Phyllotocus sp.* in WA. The related *P. ustulatus* is listed as present in WA.	**Low:** Adults a short lived and swarm to flowering trees while larvae are soil dwelling feeding on roots (Lawrence & Britton, 1991). Limited reports of association with *Vitis* spp suggest this unlikely to be an issue.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Phytoseius hongkongensis Swirski & Shechter, 1961 predatory mite Unlisted (s14)	**Medium/Low:** *P. hongkongensis* has been recorded from *Vitis vinifera*, which is grown extensively in WA. The related *P. fotheringhamiae* is listed as permitted in WA.	**Negligible:** Reports indicate that mites of the Phytoseiidae family are effective and widespread biocontrol agents (Jeppson, et al., 1975).	1
Phytoseius woolwichensis Schicha, 1977 predatory mite Unlisted (s14)	**Medium/Low:** *P. woolwichensis* has been recorded from *Vitis vinifera* and other plant species that are grown extensively in WA. The related *P. fotheringhamiae* is listed as permitted in WA.	**Negligible:** Reports indicate that mites of the Phytoseiidae are an effective and widespread biocontrol agent (Jeppson, et al., 1975).	1
Polistes chinensis antennalis Perkins, 1905 Asian paper wasp Prohibited – s12 (C1)	**Unknown**	**Negligible:** Prey on invertebrates and collect nectar and honeydew from flowers (Clapperton, 1999). Not a pest issue.	1
Proprioseiopsis peltatus Van der Merwe, 1968 Syn: *P. ovatus* predatory mite Unlisted (s14)	**Medium/Low:** *P. peltatus* has been recorded from *Vitis vinifera* and other plant species that are grown extensively in WA.	**Negligible:** Reports indicate that mites of the Phytoseiidae family are effective and widespread biocontrol agents (Jeppson, et al., 1975).	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Pseudaulacaspis pentagona Targioni, 1886 Syn: *Aspidiotus vitiensis* Syn: *Diaspis pentagona* Syn: *Diaspis lanatus* white peach scale / mulberry scale Prohibited – s12 (C1)	**High/Medium:** *P. pentagona* is highly polyphagous (Plantwise, 2016) with many host plants present in Western Australia.	**High:** *P. pentagona* is a highly destructive pest of fruit trees and woody ornamentals throughout the world (Hanks & Denno, 1993) including grapevines. Reports that large infestations can cause limb death and even plant death in extreme cases.	4
Pseudococcus calceolariae Maskell, 1897 Syn: *Dactylopius calceolariae* Syn: *Erium calceolariae* Syn: *Pseudococcus citrophilus* citrophilus mealybug Prohibited – s12 (C1)	**Medium/Medium:** *P. calceolariae* is listed as polyphagous. Hosts include citrus, fig, grape, pear, stone fruit, all of which are grown extensively across WA where grapes are grown.	**High:** A heavy infestation of *P. calceolariae* can render a crop unsaleable (Furness & Charles, 2010). Reported to transmit certain strains of Grapevine leafroll (Wilkox, et al., 2015). However, unlikely to be more an issue than currently present mealybugs.	4
Psychoda alternata Say, 1824 moth fly Unlisted (s14)	**Unknown**	**Negligible:** Larvae live in moist areas around sewage plants and drain pipes. Not a pest of grapevines, but could be a hitchiker in bunches.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Rhyzobius hirtellus Crotch, 1874 Syn: *Rhizobius ruficollis* ladybird Permitted – s11	**Medium/Medium:** *R. ruficollis* parasitises long-tailed mealybugs (Furness & Charles, 2010), a pest with an extensive host range and is present in WA	**Negligible:** *R. ruficollis* is a biological control agent (Furness & Charles, 2010).	1
Rhizoecus falcifer Kunckel d'Herculais, 1878 root mealybug Prohibited – s12 (C1)	**Unknown**	**Low:** Ground inhabiting pest (McKenzie, 1967), reports of it infesting grapevines, but considered a minor pest, particularly on irrigated vines.	2
Rhyparida dimidiata Baly, 1861 sugarcane leaf beetle Unlisted (s14)	**Unknown:** Several related *Rhyparida* spp are listed as present in WA.	**Low:** Adults feed on foliage and nectar while the larvae are soil dwelling (Matthews & Reid, 2002). Reports suggest this to be a sub-tropical pest of only occasional seasonal importance.	2
Scelodonta brevipilis Lea, 1915 leaf beetle Unlisted (s14)	**Unknown**	**Negligible:** *S. brevipilis* has been recorded from *Vitis vinifera.* The paucity of available literature indicates a non-pestiferous nature.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Scutiphora pedicellata Kirby, 1826 Syn: *Peltophora cruenta* Syn: *Tetyra pedicellata* metallic shield bug Prohibited – s12 (C1)	**High/High:** *S. pedicellata* been recorded as affecting native figs, fruit trees such as apricot, cherry, peach and pear, and grapes (Fletcher, 2007) which are grown in WA.	**Medium:** *S. pedicellata* feeds on vegetative growth and fruit (Hely, et al., 1982). Could be an issue if in large numbers, otherwise of only moderate concern.	3
Serrodes campana Guenee, 1852 fruit piercing moth Prohibited – s12 (C1)	**Unknown**	**Low:** Adults may attack grape berries, reports suggest a sub-tropical pest. Citrus fruits seem to be the main commercial fruit damaged (Fay & Halfpapp, 2006). Reports the adult moth feeds mainly on flowers and juice from ripe damaged fruit (Herbison-Evan & Crossley, 2016).	2
Simplicia caeneusalis Walker, 1859 Unlisted (s14)	**Unknown**	**Negligible:** Reported to feed on dead leaves (Common, 1990). Therefore unlikely to an issue.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Sinoxylon anale Lesne, 1897 auger beetle / grapevine beetle Permitted – s11	**Unknown**	**Low:** Wood boring beetle (Lawrence & Britton, 1991). Reports suggest infestations can lead to wilting of branches and occasionally entire vines, though still considered of only minor importance.	2
Sphaerococcopsis inflatipes Maskell, 1893 scale insect Unlisted (s14)	**Unknown**	**Low:** Creates bark galls (ABRS, 2009) (Beardsley, 1974). Limited reports, which suggests a minor pest.	2
Spilostethus decoratus Stal, 1866 milkweed bug Unlisted (s14)	**Unknown**	**Unknown:** The absence of available literature regarding *S. decoratus* indicates a non-pestiferous nature.	2
Testrica antica Walker, 1867 Unlisted (s14)	**Unknown**	**Unknown:** The paucity of available literature on *T. antica* indicates a non-pestiferous nature.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Tetracnemoidea brevicornis Girault, 1915 parasitic wasp Unlisted (s14)	**Medium/Low:** *T. brevicornis* parasitises Long-tailed mealybugs (Furness & Charles, 2010), a pest with an extensive host range and is present in WA.	**Negligible:** *T. brevicornis* is a biological control agent (Furness & Charles, 2010), found to parasitise long-tailed and citrophilus mealybugs, therefore not a pest of grapevines.	1
Tetranychus kanzawai Kishida, 1927 Syn: *Tetranychus hydrangeae* kanzawa spider mite Prohibited – s12 (C1)	**Medium/Medium**: *T. kanzawai* has established in Queensland and New South Wales (Walter, 1999). Host list includes strawberry, apple, peach, pear, tea, as well as grapevines (Plantwise, 2016). Development occurs at temperatures above 10°C (Vacante, 2015).	**Medium:** Generally found on the underside of leaves, but can feed on bunches. Is a significant pest of tea and egg plants in Japan and China and strawberries in Taiwan (Plantwise, 2016). Hasn't become a pest on grapevines in Queensland or New South Wales. *T. kanzawai* is a significant polyphagous pest, subject to quarantine measures in several markets.	3
Theretra clotho Drury, 1773 hawk moth Unlisted (s14)	**Medium/Medium:** Known to feed on grapevines, related species *T. oldenlandiae* and *T. latreillii* are present in WA. Appears to be of a sub-tropical nature.	**Low:** Larvae feed on leaves and have been reported to attack grapevines. Reported as an occasional localised pest (Plantwise, 2016).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Thrips coloratus Schmutz, 1913 loquat thrips Unlisted (s14)	**Unknown**	**Low:** Feeds on flowers (Mound & Masumoto, 2005), limited reports on grapevines, which suggest a low pest issue.	2
Thrips flavus Schrank, 1776 honeysuckle thrips Prohibited – s12 (C1)	**Unknown**	**Low:** Limited reports on grapevines, which suggest a low pest issue.	2
Thrips palmi Karny, 1925 melon thrips Declared pest – s22(2) (C1)	**Medium/Medium:** Host range grown widely.	**Medium:** Associated with flowers and foliage, does have an association with grapevines, though mostly in the sub-tropics, could be an issue for protected cropping.	3
Trionymus sp.	**Unknown:** Other related species – *Pseudococcus oryzae, Saccharicoccus sacchari and Vryburgia amaryllidis* are present in WA.	**Negligible:** Single report of association with *Vitis* spp. Therefore unlikely an issue.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Trogoderma variabile Ballion, 1878 Syn: *Trogoderma parabile* warehouse beetle Declared pest – s22(2) (C3)	**High/Medium:** *T. variabile* has become established in Australia, with restricted distribution in Queensland and WA (Rees, et al., 2003).	**Low:** Internationally significant invasive pest of packed goods and stored grain (Castalanelli, et al., 2011). Maybe an issue for dried grape production and quarantine, otherwise not considered a pest of grapevines.	3
Vespula germanica Fabricus, 1793 Syn: *Vespa germanica* European wasp Prohibited – s12 (C1)	**High/High:** The climate of WA is quite suitable for *V. germanica* (Spradbery & Maywald, 1992).	**High:** *V. germanica* has become a serious agricultural and social pest where it has established worldwide (Byrne & Widmer, 2016). They feed on grape berries resulting in yield reductions. Also cause issues with vineyard staff and customers visiting vineyards and associated Cellar and Cafe.	4
Xanthogaleruca luteola Muller, 1766 elm leaf beetle Prohibited – s12 (C1)	**Unknown**	**Negligible:** Only feed on elm trees. Therefore not an issue for grapevines.	1
Xylobosca decisa Lesne, 1906 Unlisted (s14)	**Unknown:** Other related species – *X. bispinosa* and *X. vidua* are present in WA.	**Low:** Wood boring beetles (Lawrence & Britton, 1991). Very few reports of an association with grapevines, so unlikely an issue.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Xylopsocus capucinus Fabricius, 1781 false powder-post beetle Unlisted (s14)	**Unknown:** Other related species – *X. gibbicollis* and *X. rubidus* are present in WA.	**Low:** Larvae feed on roots while adults bore into stems (Woodfuff, et al., 2014). Very few reports of association with grapevines, so unlikely an issue.	2
Xylothrips flanipes Illiger, 1801 auger beetle Unlisted (s14)	**Unknown:** Related species – *X. religiosa* is present in WA.	**Low:** Adults and larvae feed on the woody tissue of hosts (Liu, et al., 2008). Very few reports of association with grapevines, so unlikely an issue.	2
Zygina sp. cicada	**Unknown**	**Negligible:** Only a single record of association with *Vitis* spp. Therefore not likely an issue for grapevines.	1
Molluscs			
Cornu apertus Born, 1778 Syn: *Helix aperta* green snail Declared pest – s22(2) (C3)	**High/Medium:** *C. apertus* has an extensive host range, but is unlikely to spread far fast without assistance. Distant movement will be via infested plant material. Currently in limited areas of WA.	**Low:** Will feed on leaves, buds and young shoots. But not likely to be any worse than other present snails. They can pose an export issue, but management procedures should be possible.	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest rating
Vertebrates			
Sturnus vulgaris Born, 1778 common starling / European starling Declared pest - s22(2) (C1/C2)	**High/High:** *S. vulgaris* are strong fliers and can cover reasonable distances and will survive our climatic conditions.	**High:** *S. vulgaris* will feed on grape berries causing significant damage if not protected, netting as used for silvereyes will assist in control, but starlings are likely to be more aggressive and less distracted by flowering native plants, thus requiring increased or modified management practices.	4

Table 9 List of potential exotic threats to the Western Australian viticulture industries and evaluation summaries — pathogens (disease causing organisms and nematodes)

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Bacteria & Phytoplasmas			
Buckland Valley grapevine yellows BVGY Unlisted (s14)	**High/Medium:** Phytoplasmas are generally transmitted by graft transmission and leafhoppers in grapevines (Wilkox, et al., 2015) (Constable, et al., 2002). However, no vectors have yet been identified for BVGY (Wilkox, et al., 2015). Other phytoplasmas, such as *Australian grapevine yellows* have established in WA.	**High:** Phytoplasmas can result in high yield losses in severe cases, but good agricultural practices – such as using indexed planting material – should minimise the likely impact.	4
Rhizobium rubi (Hildebrand, 1940) Young *et al.,* 2001 comb. nov. Syn.: *Agrobacterium rubi* cane gall Unlisted (s14)	**Medium/Low:** *Rhizobium rubi* is spread through infected planting material only. Other *Rhizobium* spp have established in WA (Shivas, 1989).	**Negligible:** *Rhizobium rubi* is only listed as a minor issue on its main hosts *Rubus* spp (CABI, 2016). Good agricultural practices should limit its spread.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Fungi			
Alternaria vitis Cavara, 1888 Unlisted (s14)	**High/Medium:** Other *Alternaria* spp are established in Western Australia (Plant Health Australia, 2016).	**Medium:** *Alternaria vitis* primarily causes leaf blight on *Vitis* spp (Deepthi, 2006). Limited information available of this causing a berry rot (Washington & Nancarrow, 1983). However, NZ list this as a Risk group 1 quarantine pest.	3
Ascochyta ampelina Sacc., 1878 Unlisted (s14)	**High/Medium:** Other related Genus have established in WA. The fungus grows between 5 and 28°C, ideal 22-25°C (Kiewnick, 1989).	**Medium:** *Ascochyta ampelina* is primarily a leaf pathogen (Kiewnick, 1989) and generally considered a weak pathogen. However, NZ list this as a Risk group 1 quarantine pest.	3
Ascochyta chlorospora Speg., 1879 Unlisted (s14)	**High/Medium:** Other related Genus have established in WA.	**Low:** *Ascochyta chlorospora* is generally associated with leaves and twigs of *Prunus* spp (Valiuokaite, 2002). Very little information which suggests low impact. However, NZ list this as a Risk group 1 quarantine pest.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Aspergillus aculeatus Iizuka, 1953 Unlisted (s14)	**High/Medium:** Other *Aspergillus* spp are established in Western Australia (Plant Health Australia, 2016).	**Low:** *Aspergillus aculeatus* is a secondary invader of damaged berries (Wilkox, et al., 2015) but has been reported as a post-harvest pathogen of tomatoes (Kozakiewicz, 2003).	2
Aspergillus atropurpureus Zimm., 1902 Unlisted (s14)	**High/Medium:** Other *Aspergillus* species are established in Western Australia (Plant Health Australia, 2016).	**Low:** *Aspergillus* species are generally secondary invaders of damaged berries (Wilkox, et al., 2015). *A. atropurpureus* has not been reported as a pathogen of any other plant species (Farr & Rossman, 2011).	2
Aspergillus carbonarius (Bainier) Thom, 1916 Unlisted (s14)	**High/Medium:** Other *Aspergillus* spp are established in Western Australia (Plant Health Australia, 2016).	**Low:** *Aspergillus* spp are generally secondary invaders of damaged berries (Wilkox, et al., 2015). *A. atropurpureus* has not been reported as a pathogen of any other plant species (Farr & Rossman, 2011).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Botryosphaeria sarmentorum A.J.L. Phillips, J. Luque & A. Alves, 2005 Botryosphaeria canker Unlisted (s14)	**High/Medium:** Botryosphaeriaceae have a high pathogenicity and tolerance to a wide range of environmental conditions. Grapevines (table and wine) are located from the Gascoyne region in the north of the State to the South-West region of WA.	**High:** Due to their pathogenicity, Botryosphaeriaceae pose a significant threat to the Australian wine industry (Pitt, et al., 2013). Western Australia is a notable fine wine producer (DAFWA, 2016). Can cause berry rots as well as dead-arm symptoms. However, WA has learnt to function with other *Botryosphaeria* spp through good agricultural practices.	4
Capnodium elongatum Berk. & Desm., 1849 sooty mould Unlisted (s14)	**High/Medium:** Grapevines (table and wine) are located from the Gascoyne region in the north of the State to the South-West region of WA. Other hosts are also grown in these regions.	**Medium:** Excretion of sticky honeydew by mealybugs leads to sooty mould development on leaves and bunches if large populations arise. Sooty mould covering leaves can reduce photosynthesis and mould on grapes can make the fruit unsaleable or lead to rotting (Dunn & Zurbo, 2014). However, other sooty moulds exist in WA, with control measures available.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Cladosporium uvarum McAlpine, 1898 Unlisted (s14)	**High/Medium:** Multiple hosts of the fungus (Farr & Rossman, 2011) are cultivated in Western Australia. Spores are airborne (Erkara, et al., 2008). The fungus has established in other parts of Australia. Other *Cladosporium* spp are established in WA.	**Negligible:** No evidence of economic significance (Nicholas, et al., 2010).	1
Cryptovalsa ampelina (Nitschke) Fuckel, 1870 Diatrypaceae canker Unlisted (s14)	**Medium/Medium:** Enters through pruning wounds. Where established, it is quite widespread on grapevines. Established in other grape growing regions in Australia (Mostert, et al., 2004).	**Medium:** Reported in association with grapevine canes (Mostert, et al., 2004). Associated with trunk diseases of grapevines. Can infect dormant canes causing vascular necrosis (Trouillas & Gubler, 2010). Generally not considered to be a major pathogen of grapes (Luque, et al., 2006) and of low virulence (Mostert, et al., 2004) (Luque, et al., 2006). However, in a study reported in 2013 it demonstrated pathogenicity only slightly less than *Eutypa lata* (Pitt, et al., 2013). Likely controlled using similar methods to limit spread of Eutypa dieback (Pitt, et al., 2013).	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Cylindrocarpon liriodendri J.D. MacDon. & E.E. Butler, 1981 black-foot disease Unlisted (s14)	**High/Medium:** Can affect a wide range of plants including grapevines, which are widely grown in WA. *C. liriodendri* is highly virulent (Urbez-Torres, et al., 2014). Likely transported on infected plant material or infested soil. Once in the soil, can infest plants directly through the roots or crown.	**High:** *Cylindrocarpon liriodendri* associated with black-foot disease of grapevines (Whitelaw-Weckert, et al., 2007). Black-foot disease seems to be an increasing issue in vineyards in California (Petit & Gubler, 2007) and is causing significant loses in grapevine regions worldwide (Urbez-Torres, et al., 2014). *C. liriodendri* is highly virulent with young vines <7year old mainly affected, which eventually die (Urbez-Torres, et al., 2014). *C. liriodendri* has recently been detected in WA on alternate hosts but not yet grapevines.	N/A
Cytospora mammosa McAlpine, 1898 Unlisted (s14)	**Medium/Medium:** *Vitis vinifera* is the only reported host of *Cytospora mammosa* and is cultivated in Western Australia (Washington & Nancarrow, 1983).	**Low:** There has only been one report of this fungus worldwide and it is not listed as a major pathogen of grapes (Wilkox, et al., 2015) (Nicholas, et al., 2010).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Diaporthe rudis (Fr.) Nitschke, 1870 Unlisted (s14)	**High/Medium:** Also associated with stem end rot of avocados (Torres, et al., 2016) which are widely grown in WA (DAFWA, 2016). Other hosts include *Eucalyptus* spp and *Malus* spp as well as *Vitis vinifera* (Udayanga, et al., 2014).	**Medium:** Found on bark of branches and twigs, also reported on leaves of hosts (Farr & Rossman, 2011). Causes bud blight of grapevine. Associated with stem end rot of avocados, but limited reports of economic damage to grapevines.	3
Diatrype stigma (hoffm.) Fr., 1849 Diatrypaceae canker Unlisted (s14)	**High/Medium:** Capable of colonising both dormant canes and green shoots of grapevines (Trouillas & Gubler, 2010).	**Medium:** Reported from cankered wood of grapevines in California and colonisation of dormant canes/ mature wood causing vascular necrosis (Australian Department of Agriculture, 2014). No association with grape bunches was found. Seems to be one of a complex of pathogens that cause cankers, limited data on the actual economic impact.	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Diatrypella vulgaris Trouillas, W. M. Pitt & Gubler, sp. nov. Diatrypaceae canker Unlisted (s14)	**High/Medium:** Grape vineyards are located from the Gascoyne region in the north of the State to the South-West region of WA. Enters through pruning wounds. Where established, it is quite widespread on grapevines.	**Medium:** Isolated from cankers on grapevines (Trouillas, et al., 2011). Associated with trunk diseases of grapevines. In a study reported in 2013 it demonstrated pathogenicity only slightly less than *Eutypa lata* (Pitt, et al., 2013). Likely controlled using similar methods to limit spread of eutypa dieback (Pitt, et al., 2013).	4
Dothiorella iberica A.J.L. Phillips, J. Luque & A. Alves, 2005 *Syn: Botryosphaeria iberica* A.J.L. Phillips, J. Luque & A. Alves, 2005 Botryosphaeria canker Prohibited - s12	**High/Medium:** Botryosphaeriaceae have a high pathogenicity and tolerance to a wide range of environmental conditions. Grapevines are located from Gascoyne region in the north of the State to the South-West region of WA.	**High:** Due to their pathogenicity, Botryosphaeriaceae pose a significant threat to the Australian wine industry (Pitt, et al., 2013). Can cause berry rots as well as dead-arm symptoms. However, WA has learnt to function with other *Botryosphaeria* spp through good agricultural practices.	4
Dothiorella neclivorem W.M. Pitt & J.R. Úrbez-Torres, 2015 Botryosphaeria canker Prohibited - s12	**High/Medium:** Botryosphaeriaceae have a high pathogenicity and tolerance to a wide range of environmental conditions.	**Medium:** Due to their pathogenicity, Botryosphaeriaceae pose a significant threat to the Australian wine industry (Pitt, et al., 2013).	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Dothiorella vidmadera W.M. Pitt, J.R. Úrbez-Torres, Trouillas, 2013 Botryosphaeria canker Prohibited - s12	**High/Medium:** Botryosphaeriaceae have a high pathogenicity and tolerance to a wide range of environmental conditions.	**Medium:** Due to their pathogenicity, prevalence, distribution and tolerance to a wide range of environmental conditions, Botryosphaeriaceae pose a significant threat to the Australian wine industry (Pitt, et al., 2013).	4
Dothiorella vinea-gemmae W.M. Pitt & J.R. Úrbez-Torres, 2015 Botryosphaeria canker Prohibited - s12	**High/Medium:** Botryosphaeriaceae have a high pathogenicity and tolerance to a wide range of environmental conditions.	**Medium:** Due to their pathogenicity, prevalence, distribution and tolerance to a wide range of environmental conditions, Botryosphaeriaceae pose a significant threat to the Australian wine industry (Pitt, et al., 2013).	4
Eutypa lata (Pers.) Tul. & C. Tul., 1863 eutypa dieback (Diatrypaceae) Prohibited - s12 (C1)	**High/Medium:** *E. lata* infects via open wounds through air-borne and rain splashed spores and can infect pome and stone fruit trees as well as grapevines (Sosnowski & Loschiavo, 2010). Vineyards are located from the Gascoyne region in the north down to the Great-Southern region in the south of WA.	**High:** *Eutypa lata* is generally associated with trunk and stem cankers (Wilkox, et al., 2015) and causes yield losses, and gradual decline and eventually death of grapevines (Sosnowski & Loschiavo, 2010). *E lata* is a significant pathogen of grapevines worldwide. Managed in a similar way to Botryosphaeria canker.	5

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Eutypella microtheca Trouillas, W. M. Pitt & Gubler sp. nov. Diatrypaceae canker Unlisted (s14)	**High/Medium:** Related *Eutypella citricola* has established in WA. Infects in a similar way to *Eutypa lata*. Vineyards are located from the Gascoyne region in the north down to the Great-Southern region in the south of WA.	**High:** Isolated from dead branches of grapevines (Trouillas, et al., 2011). Reported causing slow decline and productivity loss of vineyards in Mexico (Paolinelli-Alfonso, et al., 2015). Reported to be of similar virulence to *Eutypa lata* but does not appear to be as aggressive (Pitt, et al., 2013). Managed in a similar way to Botryosphaeria canker.	4
Fomitiporia australiensis M. Fisch., J. Edwards, Cunningt. & Pascoe, 2005 esca disease / white heart rot Unlisted (s14)	**High/Medium:** It is believed that *Fomitiporia* spp infect grapevine pruning cuts via air-borne spores (Li, et al., 2016).	**Medium:** *Fomitiporia australiensis* has been isolated from stems and trunks of grapevines in association with canker and white heart rot (esca disease) (Fischer, et al., 2005). While esca disease is causing economic losses in grapevine in regions of Europe, it does not appear to be causing significant economic losses in Australia (Fischer, et al., 2005). Esca disease is thought to have an association with stress.	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Fomitiporia punctata (Fr.) Murrill, 1947 Syn: *Phellinus punctatus* (Fr.) Pilát, 1942 esca disease / white heart rot Unlisted (s14)	**High/Medium:** It is believed that *Fomitiporia* spp infect grapevine pruning cuts via air-borne spores (Li, et al., 2016).	**Medium:** *Fomitiporia punctata* has been isolated from stems of grapevines in association with white heart rot (esca disease) (Fischer, et al., 2005). While esca disease is causing economic losses in grapevine in regions of Europe, it does not appear to be causing significant economic losses in Australia (Edwards & Pascoe, 2004). Esca disease is thought to have an association with stress.	4
Greeneria uvicola (Berk. & M.A. Curtis) Punith., 1974 bitter rot Prohibited - s12 (C1)	**High/Medium:** Hosts of *Greeneria uvicola* are cultivated in Western Australia. Infection occurs from 12°C, with an optimum of 28-30°C (Wilkox, et al., 2015). Particularly prevalent in warm wet conditions close to harvest (Steel, 2014).	**High:** *Greeneria uvicola* causes bitter rot of ripe fruit, resulting in reduced marketability of wine and table grapes due to the bitter flavour of the berries (Wilkox, et al., 2015).	4
Hendersonia corticalis Ellis & Everh. Unlisted (s14)	**Unknown**	**Negligible:** There are very few reports of this fungus worldwide and it is not listed as a major pathogen of grapes (Wilkox, et al., 2015).	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Hendersonia tenuipes McAlpine, 1898 Unlisted (s14)	**Unknown**	**Negligible:** There are very few reports of this fungus worldwide and it is not listed as a major pathogen of grapes (Wilkox, et al., 2015).	1
Ilyonectria macrodidyma (Halleen, Schroers & Crous) P. Chaverri & Salgado, 2011 black foot disease Unlisted (s14)	**High/Medium:** Hosts of *Ilyonectria macrodidyma* are cultivated in Western Australia – these include *Vitis vinifera*, *Persea americana* and *Olea europaea* (dos Santos, et al., 2014) (Vitale, et al., 2012) (Urbez-Torres, et al., 2012). Initial infection from movement of infected plants (from nursery) of soil. Can remain in the soil as chlamydospores for many years (Weckert, 2014)	**High:** Reported in association with black foot disease and root rot (Auger, et al., 2007). Isolated from grapevines in Brazil showing reduced vigour, vascular and root lesions and death (dos Santos, et al., 2014).	5

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Lachnella alboviolascens (Alb. & Schwein.) Fr., 1849 Unlisted (s14)	**Unknown**	**Negligible:** One record of this fungus on grapevines was associated with bark (Washington & Nancarrow 1983). Generally associated with woody and herbaceous stems, dead branches and twigs (Farr & Rossman, 2011). Limited data on this pest in association with grapevines suggests it is not currently a pest.	1
Leptoxyphium fumago (Woron.) R.C. Srivast., 1982 Unlisted (s14)	**Unknown**	**Low:** *Leptoxyphium* species are sooty moulds, growing as saprophytes on sugary exudates produced by sap feeding insects growing on the surface of living leaves (Yang, et al., 2014). Isolated from *Vitis* sp. leaf (Plant Health Australia, 2016). Limited data on this pest in association with grapevines suggests it is not currently a significant pest.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Microdiplodia inconspicua (Cooke) Allesch., 1901 Syn: *Diplodia sclerotiorum* Viala & Sacc., 1892 Unlisted (s14)	**Unknown:** Limited information is available on this, but as it is a Botryosphaeriaceae and other related species are found in WA, it would be expected that this could establish.	**Low:** Reported in association with leaves as *Diplodia sclerotiorum* Viala & Sacc., 1892. It is a member of the Botryosphaeriaceae family, so could pose a threat to the Australian wine industry (Pitt, et al., 2013). Very limited data on this pest suggests it is not currently a pest.	3
Monochaetia viticola (Cavara) Sacc. & D. Sacc., 1906 Unlisted (s14)	**Unknown:** Hosts of *Monochaetia viticola* are cultivated in Western Australia – these include *Vitis vinifera*.	**Low:** Reported in association with canes (Washington & Nancarrow, 1983) (Farr & Rossman, 2011). Has an association with esca disease (Rabai, et al., 2008), though appears not to be a primary cause.	2
Monochaetinula ampelophila (Speg.) Nag Raj, 1993 Syn: *Monochaetia ampelophila* **(**Speg.) 1910 Syn: *Cryptostictis ampelophila* (Speg.) Guba 1961 Unlisted (s14)	**Unknown**	**Low:** *Monochaetia* species (~ *Monochaetinula*) are generally reported in association with leaves (Sutton, 1980). Limited data on this pest in association with grapevines suggests it is not currently a pest.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Mycosphaerella succedanea (Pass.) Tomilin, 1970 Unlisted (s14)	**Unknown**	**Low:** Reported in association with leaves (Plant Health Australia, 2016). The genus *Mycosphaerella* are generally considered follicolous (growing, or living, on leaves) (CBS-KNAW Fungal Biodiversity Centre, 2011). Limited data on this pest in association with grapevines suggests it is not currently a pest.	1
Nectria cinnabarina (Tode) Fr, 1849 Syn: *Tubercularia vulgaris* Prohibited - s12 (C1)	**Unknown**	**Low:** *Nectria cinnabarina* acts mostly as a saprophyte, living on dead plant tissue, and as such is not generally considered a serious pathogen. However, it is also weakly pathogenic, colonizing stems and branches weakened by mechanical injury, physiological stress, or other disease (Biosecurity Australia, 2005).	2
Oidiodendron cereale (Thüm.) G.L. Barron, 1962 Unlisted (s14)	**Unknown**	**Negligible: I**solated as a saprophyte from grapevine stem (Plant Health Australia, 2016). Not reported as a pathogen of grapes.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Papulaspora biformospora Kiril., 1971 Unlisted (s14)	**Unknown**	**Negligible:** Reported in association with *Vitis vinifera* roots (Plant Health Australia, 2016). Not reported as a pathogen of grapes.	1
Passalora dissiliens (Duby) U. Braun & Crous, 2003 Syn: *Phaeoramularia dissiliens* (Duby) Deighton, 1976 Associated with cercospora leaf-spot Unlisted (s14)	**Unknown:** Hosts of *Passalora dissiliens* are cultivated in Western Australia – these include *Vitis vinifera*.	**Low:** Reported in association with leaves of grapevines (Washington & Nancarrow, 1983). Causes cercospora leaf spot, but is only considered a minor foliage disease (Wilkox, et al., 2015).	2
Penicillium bicolor (Lilj.) Fr., 1832 Unlisted (s14)	**High/Medium:** *Penicillium* spp affect most kinds of fruit and vegetables (Australian Department of Agriculture, 2014). Many other *Penicillium* spp. are established in Western Australia (Plant Health Australia, 2016).	**Low:** Species of *Penicillium* associated with berry rot are generally secondary invaders (Wilkox, et al., 2015). Current management practices including good hygiene practices are likely to control additional *Penicillium* spp (Wilkox, et al., 2015).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Penicillium simplicissimum (Oudem.) Thom, 1930 Unlisted (s14)	**High/Medium:** *Penicillium* spp affect most kinds of fruit and vegetables (Australian Department of Agriculture, 2014). Many other *Penicillium* spp. are established in Western Australia (Plant Health Australia, 2016).	**Low:** Species of *Penicillium* associated with berry rot are generally secondary invaders (Wilkox, et al., 2015). Current management practices including good hygiene practices are likely to control additional *Penicillium* spp (Wilkox, et al., 2015).	2
Penicillium viticola Nonaka & Masuma, 2011 Unlisted (s14)	**High/Medium:** *Penicillium* spp affect most kinds of fruit and vegetables (Australian Department of Agriculture, 2014). Many other *Penicillium* spp are established in Western Australia (Plant Health Australia, 2016).	**Low:** Species of *Penicillium* associated with berry rot are generally secondary invaders (Wilkox, et al., 2015). Current management practices including good hygiene practices are likely to control additional *Penicillium* spp (Wilkox, et al., 2015).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Pestalotiopsis funereoides Steyaert 1949 Syn: *Pestalotiopsis funerea* (Desm.) Steyaert, 1949 leaf spot Prohibited - s12 (C1)	**Unknown:** Hosts of this fungus are grown in Western Australia.	**Low:** Affects leaves, stems and roots of its hosts (Mordue, 1976). No report of association with grape bunches was found (Australian Department of Agriculture, 2014). A minor pathogen of conifers, causing leaf and stem blight in seedlings and nursery stock or disease following environmental stress/damage (Mordue, 1976). Unlikely to be a significant pest of grapes.	2
Pestalotiopsis menezesiana (Bres. & Torrend) Bissett, 1983 Syn: *Pestalotia menezesiana* Prohibited - s12 (C1)	**High/Medium:** Hosts of this fungus (Farr & Rossman, 2011) are cultivated in Western Australia. Natural dispersal is through water splash and air-borne spores, wider dispersal via infected plant stock (DAFWA, 2015).	**High:** This fungus has been implicated in causing severe defoliation of grapevines and rotting of berries in India and has been shown to cause fruit rotting in Japan (Sergeeva, et al., 2005). Full expression of symptoms is considered to be related to stress (DAFWA, 2015).	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Pestalotiopsis uvicola (Speg.) Bissett, 1983 Syn: *Pestalotia uvicola* Speg., 1878 Prohibited - s12	**High/Medium:** Hosts of this fungus listed (Farr & Rossman, 2011) are cultivated in Western Australia. Natural dispersal is through water splash and air-borne spores, wider dispersal via infected plant stock (DAFWA, 2015).	**High:** This fungus has been shown to cause rotting of berries in Japan (Australian Department of Agriculture, 2014) and in eastern Australia (Sergeeva, et al., 2005). Full expression of symptoms is considered to be related to stress (DAFWA, 2015).	4
Phaeoacremonium aleophilum W. Gams, Crous, M.J. Wingf. & Mugnai, 1996 esca / petri disease Unlisted (s14)	**High/Medium:** Hosts of this fungus are cultivated in Western Australia. Can spread via infected plant material and pruning cuts via aerial inoculum (Wilkox, et al., 2015).	**Medium:** Reported in association with grapevine canes, stems, trunks and cordons (Plant Health Australia, 2016) (Mostert, et al., 2006) and fruit ("Measles") in California. Often associated with other stress events such as low water and high temperatures (Wilkox, et al., 2015).	4
Phaeoacremonium australiense L. Mostert, Summerb. & Crous, 2005 esca / petri disease Unlisted (s14)	**High/Medium:** Hosts of this fungus are cultivated in Western Australia. Can spread via infected plant material and pruning cuts via aerial inoculum (Wilkox, et al., 2015).	**Medium:** Reported in association with esca / petri disease of grapevine canes and stems (Mostert, et al., 2006) (Plant Health Australia, 2016). Limited damage report data in Australia.	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Phaeoacremonium parasiticum (Ajello, Georg & C.J. Wang) W. Gams, rous & M.J. Wingf., 1996 esca / petri disease Unlisted (s14)	**High/Medium:** Hosts of this fungus are cultivated in Western Australia. Can spread via infected plant material and pruning cuts via aerial inoculum (Wilkox, et al., 2015).	**Medium:** Reported in association with esca / petri disease of grapevine canes and stems (Mostert, et al., 2006) (Plant Health Australia, 2016). Limited damage report data in Australia.	4
Phoma tuberculata McAlpine, 1898 Unlisted (s14)	**Medium/Medium:** *Vitis vinifera* is the only reported host of the fungus and is cultivated in Western Australia (Royal Botanic Gardens Kew, Landcare Research-NZ, Chinese Academy of Science, 2011).	**Low:** There are very few reports of this fungus worldwide and it is not listed as a major pathogen of grapes (Wilkox, et al., 2015) (Nicholas, et al., 2010) (Rabai, et al., 2008).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Phomopsis viticola (Sacc.) Sacc., 1915 Syn: *Diaporthe ampelina* (Berkeley & M.A. Curtis) R.R Gomes, C. Glienke & Crous, 2013 Syn: *Phoma viticola* Sacc., 1880 phomopsis cane and leaf spot Prohibited - s12 (C1)	**High/Medium:** *Phomopsis viticola* is established in temperate climatic regions throughout the viticultural world and has been reported in Africa, Asia, Australia (except Western Australia), Europe and North America (Wilkox, et al., 2015). Several grape production areas of Western Australia have a suitable temperate climate.	**High:** *Phomopsis viticola* is a serious pathogen of grapes in several viticultural regions of the world (Wilkox, et al., 2015). Berry infection, either direct or via infected rachis tissues can occur throughout the growing season. Once inside green tissues of the berry, the fungus becomes latent (Erincik, et al., 2002) and infected berries remain without symptoms until late in the season when the fruit matures (Ellis & Erincik, 2008). There are quarantine and market implications for the table grape industry.	5
Phyllosticta sp. phyllostitca leaf spot Unlisted (s14)	**Unknown**	**Negligible:** Phyllosticta leaf spot only affects leaves (Biosecurity Australia, 2011). *Phyllosticta* species reported from *Vitis* spp include *P. ampelicidia* (black rot) and *P. vitis-rotundifoliae*, a new species reported from *V. rotundifoliae* in the USA (Zhou, et al., 2015). *Phyllosticta sp.* has not been reported on *Vitis* in Australia.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Physarum sp. dusty mould Unlisted (s14)	**Unknown**	**Negligible:** Physarum mould occurs on leaves of grapevines (Biosecurity Australia, 2011). Slime moulds are generally non-pathogenic Frequently seen on lawns, crop stubble, mulch and rotting wood occurring under conditions with warm temperatures and high moisture. Limited reports of damage suggest this pest to be of low importance.	1
Pilidiella castaneicola (Ellis & Everh) Arx, 1957 Syn: *Coniella castaneicola* (Ellis & Everh.) B Sutton, 1980 Syn: *Gloeosporium castaneicola* Ellis & Everh, 1895 Syn: *Phyllosticta castaneicola* (Ellis & Everh.) white rot Prohibited - s12	**Medium/Medium:** This fungus has a variety of hosts (Australian Department of Agriculture, 2014). Table and wine grapes are widely grown in Western Australia.	**Medium:** Causes white rot of grapevine berries reducing marketability and causes fruit rot of strawberries (Australian Department of Agriculture, 2014). Considered to be of similar virulence to *P. diplodiella*. It is present in Qld, NSW, Vic & NT, but has not yet been detected causing berry rot.	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Pilidiella diplodiella (Speg.) Crous & Van Niekerk, 2004 Syn: *Coniella diplodiella* (Speg.) Petr. & Syd, 1927 Syn: *Clisosporium diplodiella* Syn: *Coniothyrium diplodiella* Syn: *Phoma diplodiella* white rot Prohibited - s12 (C1)	**Medium/Medium:** This fungus has a variety of hosts (Australian Department of Agriculture, 2014). Table and wine grapes are widely grown in Western Australia. Conidia germinate in free water at temperatures of 11-30°C, infection of berries occurs within 6h of wetness at optimal temperature of 22-27°C, infection is low below 15°C, cluster susceptibility is highest during flowering (Wilkox, et al., 2015) – so this may limit its spread in the south west.	**Medium:** Causes white rot of grapevine berries reducing marketability and causes fruit rot of strawberries (Australian Department of Agriculture, 2014). Heavy infection can result in 20-80% yield loses, particularly if associated with hail (Wilkox, et al., 2015). It is present in NSW, but has not presently become a serious issue.	4
Pleurostomophora richardsiae (Nannf.) L. Mostert, W. Gams & Crous, 2004 Unlisted (s14)	**Medium/Medium:** Similar pathogens have established in WA where there are plenty of grapevines grown.	**Medium:** Reported in association with grapevine trunks and causing vascular discolouration similar to petri and esca disease (Halleen, et al., 2007), though would not seem to be the primary pathogen. *P. ricardsiae* is considered a pathogen of grapevines in southern Italy (Carlucci, et al., 2015). It can also (albeit rare) cause infections to humans via injury.	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Pseudocercospora vitis (Lév.) Speg., 1910 Syn: *Mycosphaerella personata* Syn: *Cercospera viticola* Syn: *Cladosporium viticola* Syn: *Isariopsis vitis* isariopsis leaf spot; leaf blight Prohibited - s12 (C1)	**Low/Low:** Reported to be more of an issue in regions of high humidity (Sisterna & Ronco, 2005).	**Low:** Reported as causing leaf blight (Wilkox, et al., 2015) (Plant Health Australia, 2016). Infects leaves, but no reports of association with grape bunches (Australian Department of Agriculture, 2014).	2
Pythium rostratum E.J. Butler, 1907 Unlisted (s14)	**High/Medium:** Related *Pythium* species occur in WA.	**Low:** *Pythium* spp are generally associated with damping-off and root diseases (Hawksworth, et al., 1995). *P. rostratum* is also reported to infect strawberries and citrus. Limited data exists on the virulence of *P. rostratum* on grapevines, but it has been implicated in causing vine decline (in association with other stem diseases) in South Africa (Spies, et al., 2011).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Sarocladium strictum (W. Gams) summerbell, 2011 Syn: *Acremonium strictum* W. Gams, 1971 Syn: *Cephalosporium acremonium* Syn: *Haplotrichum acremonium* Syn: *Hyalopus acremonium* Prohibited - s12 (C1)	**Unknown**	**Low:** Associated with wood (Plant Health Australia, 2016), also sometimes isolated as an endophytic pathogen associated with twigs, leaves and bunches (Garijo, et al., 2011) (Gonzalez & Tello, 2011). Not generally considered a pathogen of significance.	2
Seimatosporium hysterioides (Fuckel) Brockmann, 1976 Unlisted (s14)	**Unknown:** Specimens attributed to *S. lichenicola* in WA may be *S. hysterioides* (Sergeeva, et al., 2005).	**Low:** Reported in association with twigs, stems and canes (Sergeeva, et al., 2005). Found throughout Europe, usually associated with dead stems (Sergeeva, et al., 2005).	3
Septoria vitis Lév., 1846 Unlisted (s14)	**Unknown**	**Low:** Reported in association with leaves (Washington & Nancarrow, 1983). Related to *S. ampelina* which causes septoria leaf spot, a minor disease of grapevines in the US. *S. ampelina* does not infest *Vitis vinifera*, but will infect various interspecific *Vitis* hybrids.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Spencermartinsia plurivora Abdollahz, Javadi & A.J.L. Phillips, 2014 Prohibited - s12	**Medium/Medium:** Other Botryosphaeriaceae have readily established in grape growing regions of WA and are known for their pathogenicity, prevalence, distribution and tolerance to a wide range of environmental conditions (Pitt, et al., 2013).	**Medium:** Due to their pathogenicity, Botryosphaeriaceae pose a significant threat to the Australian wine industry (Pitt, et al., 2013).	4
Spencermartinsia viticola (A.J.L. Phillips & J. Luque) A.J.L. Phillips, A. Alves & Crous, 2008 Syn: *Botryosphaeria viticola* Prohibited - s12	**Medium/Medium:** Other Botryosphaeriaceae have readily established in grape growing regions of WA and are known for their pathogenicity, prevalence, distribution and tolerance to a wide range of environmental conditions (Pitt, et al., 2013).	**Medium:** Due to their pathogenicity, Botryosphaeriaceae pose a significant threat to the Australian wine industry (Pitt, et al., 2013).	4
Sphaerella fumaginea Catt., 1879 Unlisted (s14)	**Unknown**	**Unknown:** Original description based on isolate from grapevine branches and twigs (Royal Botanic Gardens Kew, Landcare Research-NZ, Chinese Academy of Science, 2011). Limited reports of this causing damage suggest it is of low pathogenicity.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Sphaerella vitis Fuckel, 1870 Unlisted (s14)	**Unknown**	**Low:** Original description based on isolate from grapevine leaves (Royal Botanic Gardens Kew, Landcare Research-NZ, Chinese Academy of Science, 2011). Limited reports of this causing damage suggest it is of low pathogenicity.	2
Sporocadus rhododendri (Schwein.) M. Morelet, 1985 Unlisted (s14)	**Unknown**	**Low:** Reported in association with canes (Sergeeva, et al., 2005) (Plant Health Australia, 2016). Limited reports of this causing damage suggest it is of low pathogenicity.	2
Strumella vitis McAlpine, 1898 Unlisted (s14)	**Unknown**	**Low:** There are very few reports of this fungus worldwide and it is not listed as a major pathogen of grapes (Wilkox, et al., 2015) (Nicholas, et al., 2010).	2
Talaromyces wortmannii (Klocker) C.R. Benjamin, 1955 Unlisted (s14)	**Unknown**	**Negligible:** Primarily reported from soil and sometimes from food such as wheat, pecans and salami (Biosecurity Australia, 2005) (Pitt & Hocking, 2009). Reported as an endophyte, so unlikely to cause any economic impact.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Tilletiopsis washingtonesis Nyland, 1950 Unlisted (s14)	**Unknown**	**Negligible:** Members of this genus are saprophtyes and colonise the leaf surface. *T. washingtonesis* has been assessed for its capacity to reduce the growth of Powdery mildew (*Spaerotheca fuliginea*) on greenhouse cucumbers (Urquhart, et al., 1994).	1
Torula viticola Allesch. Unlisted (s14)	**Unknown**	**Negligible:** The only record found detailed it on cane tissue of *V. vinifera* in Victoria. No other records of this fungus on grapevines in other countries or Australia were found in the general scientific literature. Endophytic fungi inhabit plant tissue without causing visible disease symptoms (Gonzalez & Tello, 2011). This indicates this fungus is not of economic consequence.	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Trichoderma citrinoviride Bissett 1984 Unlisted (s14)	**Unknown**	**Negligible:** *Trichoderma* spp are cosmopolitan in soils and on decaying wood and vegetable matter (Gams & Bissett, 2002). *Trichoderma* spp are normally endophytes and should not pose an economic concern.	1
Truncatella angustata (Pers.) S. Hughes, 1958 Unlisted (s14)	**High/Medium:** Hosts of this pathogen are grown across Western Australia.	**Low:** Reported in association with stems (Plant Health Australia, 2016) and as an endophyte on twigs and branches (Gonzalez & Tello, 2011). Reported to be the causal agent of grapevine trunk disease in Iran (Arzanlou, et al., 2013), but on the whole minimal reports of economic impact.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Venturia tremulae Aderh., 1897 Unlisted (s14)	**High/Medium:** Related species *V. inequalis* (causal agent of Apple scab) has established in WA.	**Low:** Pathogen will cause leaf fall, recurrent infection can cause poor growth & dieback (Smith, et al., 1988). Causes Shephard's crook and leaf and shoot blight in forestry trees in the USA. A related species *V. inequalis* is the causal agent of Apple scab which is a serious pest of apples. However, there are scarce reports of this pathogen causing economic impact to grapevines.	2
Xeromyces bisporus L.R. Fraser, 1954 Unlisted (s14)	**Unknown**	**Low:** *Xeromyces bisporus* is a food spoilage fungi, associated with dried fruit (Dallyn & Everton, 1969) (Kew Royal Botanic Gardens, 2011).	2
Nematodes			
Aphelenchoides coffeae (Zimmeman, 1898) Filipjev, 1934 foliar nematode Unlisted (s14)	**Medium/Medium:** Distributed mainly by movement of plant material, through movement of propagation material but also plant debris such as on poorly cleaned machinery.	**Negligible:** *Aphelenchoides* spp. are ecto-parasites that generally feed on leaves and stems (Luc, et al., 1990). *Vitis vinifera* is not listed as a host on Nemaplex (Ferris, 2016).	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Aphelenchoides limberi Steiner, 1936 foliar nematode Unlisted (s14)	**Medium/Medium:** Distributed mainly by movement of plant material, through movement of propagation material but also plant debris such as on poorly cleaned machinery.	**Negligible:** *Aphelenchoides* spp. are ecto-parasites that generally feed on leaves and stems (Luc, et al., 1990). Found in association with grapevines in Iran (Deimi & Mitkowski, 2010), but without mention of level of damage. *Vitis vinifera* is not listed as a host on Nemaplex (Ferris, 2016).	1
Criconema mutabile Taylor, 1936 ring nematode Unlisted (s14)	**Medium/Low:** sedentary nematodes, juvenile stages are mobile but rarely travel too far. Likely distribution by plant or soil movement.	**Medium:** *Criconema mutabile* has been reported in association with grapes in soil around the rhizosphere (Deimi & Mitkowski 2010). Reported in association with bacterial canker of *Prunus* spp (McKenry, et al., 1990). *Vitis vinifera* is listed as a host on Nemaplex (Ferris, 2016).	3
Discolaimus agricolus Sauer & Annells, 1986 Unlisted (s14)	**Unknown**	**Low:** Collected from vineyard soil (Sauer & Annells, 1985). Very little information available on this nematode, this suggests limited economic impact.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Helicotylenchus caribensis Román, 1965 Unlisted (s14)	**Unknown**	**Low:** *Helicotylenchus* species are ecto-parasitic, semi-endo-parasitic or endo-parasitic nematodes of roots (Luc, et al., 1990). Impact on grapes is not well understood but at this point not considered significant (Esser, 1982) (Wilkox, et al., 2015).	2
Helicotylenchus digonicus Perry, 1959 Unlisted (s14)	**Unknown**	**Low:** *Helicotylenchus* species are ecto-parasitic, semi-endo-parasitic or endo-parasitic nematodes of roots (Luc, et al., 1990). Impact on grapes is not well understood but at this point not considered significant (Esser, 1982) (Wilkox, et al., 2015).	2
Helicotylenchus varicaudatus Yuen, 1964 Unlisted (s14)	**Unknown**	**Low:** *Helicotylenchus* species are ecto-parasitic, semi-endo-parasitic or endo-parasitic nematodes of roots (Luc, et al., 1990). Impact on grapes is not well understood but at this point not considered significant (Esser, 1982) (Wilkox, et al., 2015).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Hemicriconemoides sp. Chitwood & Birchfield, 1957 sheathoid nematodes, related to ring nematodes	**Medium/Low:** Sedentary nematodes, juvenile stages are mobile but rarely travel too far. Likely distribution by plant or soil movement. *Hemicriconemoides brachyurus* and *H. cocophilus* are present in WA.	**Medium:** *Hemicriconemoides* species are generally associated with roots and found in soil around the rhizosphere (Luc, et al., 1990). Considered as being as damaging as *Mesocriconema xenoplax*, which is the main ring nematode found affecting *Vitis vinifera* (Wilkox, et al., 2015) and is present in WA. *Vitis vinifera* is listed as a susceptible host on Nemaplex (Ferris, 2016).	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Longidorus elongatus de Man, 1876 needle nematode Prohibited – s12 (C1)	**High/Low:** They can feed on a range of hosts readily found in WA – quinoa, cucumber, strawberry, lettuce, perennial ryegrass, banana, bean, tomato and grape, among others (Ferris, 2016). They rarely travel too far from the original host themselves, so likely distribution is by plant or soil movement.	**Medium:** *Longidorus* species are generally associated with roots and found in soil around the roots (Luc, et al., 1990). They have been found in association with *Vitis vinifera* (CABI, 2016) (Wilkox, et al., 2015), though their level of direct damage is poorly understood. Like *Xiphinema* spp. they are often found to carry Nepoviruses, but they discard the Nepovirus with each moult (Wilkox, et al., 2015). Final pest status takes into account potential to spread *raspberry ringspot virus* and *tomato black ring virus* (both are currently absent from Australia).	4
Meloidogyne thamesi Chitwood, 1952 Thames root-knot nematode Unlisted (s14)	**High/Low:** They can feed on a range of hosts readily found in WA. Other related *Meloidogyne* spp. are established in WA. They rarely travel too far from the original host themselves, so likely distribution is by plant or soil movement.	**Low:** *Meloidogyne* species are associated with roots (Luc, et al., 1990). *Vitis vinifera* is listed as a host on Nemaplex (Ferris, 2016), but this nematode is not considered one of the significant root-knot nematodes affecting grapevines (Wilkox, et al., 2015) (Nicol, et al., 1999).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Neodolichodorus cassati Siddiqi, 1977 Unlisted (s14)	**Unknown**	**Negligible:** *Neodolichodorus* species belong to the awl nematode group and are associated with aquatic environments and soil (Nickle, 1991). The scarcity of reports with associated damage to grapevines suggests they are not a significant pest at this point.	1
Neodolichodorus obtusus Andrassy, 1976 awl nematode Unlisted (s14)	**Unknown**	**Negligible:** *Neodolichodorus* species belong to the awl nematode group and are associated with aquatic environments and soil (Nickle, 1991). The scarcity of reports with associated damage to grapevines suggests they are not a significant pest at this point.	1
Paratylenchus baldaccii Raski, 1975 pin nematode Unlisted (s14)	**Unknown**	**Low:** *Paratylenchus* species are obligate root parasites of a large range of plant species (Siddiqi, 2000). Little is understood about the impact on grapevine health of these ecto-parasitic nematodes.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Paratylenchus coronatus Colbran, 1965 pin nematode Unlisted (s14)	**Unknown**	**Low:** *Paratylenchus* species are obligate root parasites of a large range of plant species (Siddiqi, 2000). Little is understood about the impact on grapevine health of these ecto-parasitic nematodes.	2
Paratylenchus dianthus Jenkins & Taylor, 1956 pin nematode Unlisted (s14)	**Unknown**	**Low:** *Paratylenchus* species are obligate root parasites of a large range of plant species (Siddiqi, 2000). Little is understood about the impact on grapevine health of these ecto-parasitic nematodes. *Vitis vinifera* is not listed as a host on Nemaplex (Ferris, 2016).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Paratylenchus hamatus Thorne and Allen, 1950 pin nematode Prohibited – s12 (C1)	**Medium/Low:** *Paratylenchus* spp are migratory plant ecto-parsites and *P. hamatus* has an extensive listed host range – celery, broccoli, citrus, couch grass, barley, banana, avocado, plum, pear, potato and grape, among others (Ferris, 2016).	**Low:** *Paratylenchus* species are obligate root parasites of a large range of plant species (Siddiqi, 2000). Little is understood about the impact on grapevine health of these ecto-parasitic nematodes. This particular species is more commonly found in association with grapevines (Wilkox, et al., 2015). *Vitis* spp are listed as hosts on Nemaplex (Ferris, 2016). Generally only associated with vine damage to young vines planted into high populations.	3
Paratylenchus projectus Jenkins, 1956 pin nematode Unlisted (s14)	**Unknown**	**Low:** *Paratylenchus* species are obligate root parasites of a large range of plant species (Siddiqi, 2000). Little is understood about the impact on grapevine health of these ecto-parasitic nematodes.	2
Paratylenchus vandenbrandei Samibaeva, 1966 pin nematode Unlisted (s14)	**Unknown**	**Low:** *Paratylenchus* species are obligate root parasites of a large range of plant species (Siddiqi, 2000). Little is understood about the impact on grapevine health of these ecto-parasitic nematodes.	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Pratylenchus alleni Ferris, 1981 root-lesion nematode Unlisted (s14)	**Medium/Low:** *P. alleni* hosts include soybean, wheat, corn, potato and tomato. *Pratylenchus* spp rarely move more than a 1-2m in a year. Distant movement is by infected soil or plant material.	**Low:** *Pratylenchus* species are migratory endo-parasites that feed on roots (Luc, et al., 1990). *P. alleni* is a noted pest of soybean and potatoes (CDFA, 2016). *Vitis* spp are not listed as hosts on Nemaplex (Ferris, 2016).	2
Pratylenchus goodeyi Sher & Allen, 1953 banana root-lesion nematode Unlisted (s14)	**Low/Low:** *P. goodeyi* appears to have a restricted host (banana being its main host) and climate range, being found mainly in tropical highlands or warm-temperate regions.	**Negligible:** *Pratylenchus* species are migratory endo-parasites that feed on roots (Luc, et al., 1990). *Vitis* spp are not listed as hosts on Nemaplex (Ferris, 2016).	1
Pratylenchus hexincisus Taylor & Jenkins, 1957 root lesion nematode Prohibited – s12 (C1)	**Medium/Low:** host range, grapes, strawberries and brassicas (Ferris, 2016) are grown in WA. They are migratory endo-parasites, but rarely move more than a 1-2m a year. Distant movement is by infected soil or plant material.	**Low:** *Pratylenchus* species are migratory endo-parasites that feed on roots (Luc, et al., 1990). *Vitis* vinifera is listed as hosts on Nemaplex (Ferris, 2016), but they are not considered to cause economic damage to grapevines (Christiansen, 2000).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Pratylenchus jordanensis Hashim, 1983 root lesion nematode Unlisted (s14)	**Medium/Low:** Reported in association with apple (Stirling, et al., 1995).	**Low:** *Pratylenchus* species are migratory endo-parasites that feed on roots (Luc, et al., 1990). *Vitis* spp are not listed as hosts on Nemaplex (Ferris, 2016). However, there are reports of them being in association with poor growth in grapevines (Nicol, et al., 1999).	2
Pratylenchus loosi Loof, 1960 root lesion nematode Prohibited – s12 (C1)	**Medium/Low:** Are listed to infest strawberry, banana, coffee and tea (Ferris, 2016).	**Low:** *Pratylenchus* species are migratory endo-parasites that feed on roots (Luc, et al., 1990). *Vitis* spp are not listed as hosts on Nemaplex (Ferris, 2016).	2
Pratylenchus pinguicaudatus Corbett, 1969 root lesion nematode Unlisted (s14)	**Unknown**	**Low:** *Pratylenchus* species are migratory endo-parasites that feed on roots (Luc, et al., 1990). *Vitis* spp are not listed as hosts on Nemaplex (Ferris, 2016).	2
Pratylenchus pseudopratensis Seinhorst, 1968 root lesion nematode Unlisted (s14)	**Medium/Low:** Reported in association with apple and strawberry (Ferris, 2016).	**Unknown:** *Pratylenchus* species are migratory endo-parasites that feed on roots (Luc, et al., 1990). *Vitis* spp are not listed as hosts on Nemaplex (Ferris, 2016).	2

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Scutellonema clariceps Phillips, 1971 Unlisted (s14)	**Unknown**	**Unknown:** *Scutellonema* species are primarily ecto-parasites of roots (O'Bannon & Duncan, 1990). Potential damage to grapevines is not known, but there are few reports of this nematode causing economic damage to crops.	2
Thornenema cavalcanti Lordello, 1955 Unlisted (s14)	**Unknown**	**Unknown:** Members of the family Diphterophoridae are soil and marine dwelling nematodes (Nickle, 1991). Potential damage to grapevines is not known, but there are few reports of this nematode causing economic damage to crops.	2
Trichodorus sp. Cobb, 1913 Syn: *Paratrichodorus sp.* stubby-root nematodes	**Medium/Low:** There are other *Paratrichodorus* spp that are present in WA.	**Unknown:** *Trichodorus* species are ecto-parasties that feed on roots of perennial and woody plants (Luc, et al., 1990). They can transmit Tobraviruses such as *Pepper Ringspot Virus*. Their impact on grapevines is not well known. The final rating takes into account the potential to transmit viruses.	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Tylenchorhynchus sp. Cobb, 1930 stunt nematode	**Medium/Low:** Other *Tylenchorhynchus* spp present in WA include – *T. multicinctus, T.brevidens, T. capitatus*	**Unknown:** *Tylenchorhynchus* species are migratory ecto-, semi-ecto- or endo-parasites that feed on roots (Luc, et al., 1990). Their impact on grapevines is not well known.	2
Tylenchorhynchus sulcatus de Guiran, 1967 Unlisted (s14)	**Medium/Low:** Other *Tylenchorhynchus* spp present in WA include – *T. multicinctus, T.brevidens, T. capitatus*	**Unknown:** *Tylenchorhynchus* species are migratory ecto-, semi-ecto- or endo-parasites that feed on roots (Luc, et al., 1990). The susceptibility of *Vitis vinifera* to this species is not known, however it is a host to other *Tylenchorhynchus* spp (Ferris, 2016).	2
Xiphinema index Thorne & Allen, 1950 fan leaf virus nematode Prohibited – s12 (C1)	**Medium/Low:** *X. index* has an extensive host range (Ferris, 2016), many of which are grown in WA. Distant movement is by infected soil or plant material.	**High:** *Xiphinema* species are migratory ectoparasites that feed on roots (Luc, et al., 1990). *X. index* is the main *Xiphinema* species affecting grapevines. Besides direct damage to the roots, this nematode also transmits *Grapevine fan leaf virus* (Wilkox, et al., 2015) which is currently not in WA. The final rating takes into account the potential transmission of GFLV.	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Xiphinema italiae Meyl 1953 Unlisted (s14)	**Medium/Low:** *X. italiae* has a wide host range (Ferris, 2016), many of which are grown in WA. Distant movement is by infected soil or plant material.	**High:** *Xiphinema* species are migratory ecto-parasites that feed on roots (Luc, et al., 1990). *Vitis vinifera* is a listed host on Nemaplex (Ferris, 2016). Their direct impact on grapevines is not well known but *X. italiae* has been shown to be capable of transmitting *Grapevine fan leaf virus* (not currently present in WA) in Israel (Cohn, et al., 1970). The final rating takes into account the potential transmission of GFLV.	4
Xiphinema monohysterum Brown, 1968 Unlisted (s14)	**Medium/Low:** *X. monohysterum* only has a limited listed host range (Ferris, 2016), but one of these is *Vitis vinifera*. Distant movement is by infected soil or plant material.	**Unknown:** *Xiphinema* species are migratory ecto-parasites that feed on roots (Luc, et al., 1990). *Vitis vinifera* is a listed host on Nemaplex (Ferris, 2016). Their direct impact on grapevines is not well known, but there are not many reports of damage.	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Xiphinema pachtaicum Tulaganov, 1938 Unlisted (s14)	**Medium/Low:** *X. pachtaicum* has a wide host range (Ferris, 2016), many of which are grown in WA. Distant movement is by infected soil or plant material.	**Unknown:** *Xiphinema* species are migratory ecto-parasites that feed on roots (Luc, et al., 1990). *Vitis vinifera* is a listed host on Nemaplex (Ferris, 2016). Their direct impact on grapevines is not well known.	3
Protozoa			
Diderma chondrioderma (de Bary & Rostaf.) Kuntze, 1898 Unlisted (s14)	**Unknown**	**Negligible:** *D. chondrioderma* is a slime mould and was reported in association with a grapevine stem. Scarcity of reports of association or damage to grapevines.	1
Viruses/Viroids			
Apscaviroid: Australian grapevine viroid AGVd Permitted – s11	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means and through seed (Hadidi, et al., 2003) (Albrechtsen, 2006).	**Negligible:** AGVd has not been reported as having any disease effects in grapevines. AGVd produces little or no obvious disease symptoms (Martelli, 1993) (Hadidi, et al., 2003).	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Apscaviroid: grapevine yellow speckle viroid (GYSVd) strain, 1 GYSVd-1 Prohibited – s12 (C1)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means, by grafting and abrasion, and through seed (Hadidi, et al., 2003) (Albrechtsen, 2006).	**High:** Mixed infection of GYSVd-1 or GYSVd-2 and *grapevine fanleaf virus* (currently not present in WA) causes vein banding that has a detrimental effect on the yield of certain varieties (Szychowski, et al., 1995).	4
Apscaviroid: grapevine yellow speckle viroid (GYSVd) strain, 2 GVSVd-2 Prohibited – s12 (C1)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means, by grafting and abrasion, and through seed (Hadidi, et al., 2003) (Albrechtsen, 2006).	**High:** Mixed infection of GYSVd-1 or GYSVd-2 and *grapevine fanleaf virus* (currently not present in WA) causes vein banding that has a detrimental effect on the yield of certain varieties (Szychowski, et al., 1995).	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Fabavirus: broad bean wilt virus 2 BBWV-2 Prohibited – s12 (C1)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means. At least one strain is transmitted in seed of *Vicia faba* but no record of seed transmission in *Vitis* spp. was found (Australian Department of Agriculture, 2014). Transmitted in a non-persistent manner by aphids.	**Low:** While BBWV-2 will infect *Vitis vinifera*, there are limited reports on the economic impact. Listed as latent or mild mosaic symptoms (Wilkox, et al., 2015).	2
Hostuviroid: hop stunt viroid HSVd Prohibited – s12 (C1)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means, by grafting and abrasion, and through seed (Albrechtsen, 2006) (Hadidi, et al., 2003) (Koltunow, et al., 1988) (Sano & Shikata, 1988).	**Negligible:** HSVd is asymptomatic in grapevines and has not been shown to cause economic effects in grapevines. Strains of HSVd have been shown to cause symptoms and even death of other host species (Sano & Shikata, 1988).Grapevines could represent natural reservoir from which the viroid can potentially be transmitted to other susceptible host crops (El-Dougdoug, et al., 2010).	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Nectrovirus: tobacco necrosis virus TNV Prohibited – s12 (C1)	**Unknown**	**Negligible:** TNV has been reported in grapevine overseas, but it is considered a latent infection (Wilkox, et al., 2015).	1
Nepovirus A: arabis mosaic virus ArMV Prohibited – s12 (C1)	**Medium/Low:** Host plants listed are cultivated in WA and the virus has reportedly been transmitted through seed (Australian Department of Agriculture, 2014). However, the nematode vector of ArMV (*Xiphinema diversicaudatum*) is absent and therefore there would be little natural spread of the virus (Borroto-Fernandez, et al., 2009).	**Medium:** ArMV is related to GFLV and reported to produce mottling and malformations of leaves (Wilkox, et al., 2015), and reduced fruit set (Abelleira, et al., 2010). Often found in complex with GFLV (Wilkox, et al., 2015).	3
Nepovirus C: cherry leaf roll virus CLRV Prohibited – s12 (C1)	**Medium/Low:** Host plants are grown in WA – including cherry and grapes. There are suggestions of root grafting as a means of spread in cherry trees (Hansen, 2013). However natural spread seems limited in grapevines.	**Medium:** Causes chlorotic ringspots, leaf patterns and/or yellow vein netting. Virus transmitted by mechanical inoculation; transmitted by grafting; not transmitted by contact between plants (Biosecurity Australia, 2005).	3

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Nepovirus A: grapevine fan leaf virus GFLV Prohibited – s12 (C1)	**Medium/Low:** Transmitted occasionally through seed, also transmitted by a nematode vector (*Xiphinema index* – not currently present in WA) and by grafting (Habili, et al., 2001) (Martelli, 1993).	**High:** GFLV is one of the oldest virus diseases of grapevines. Susceptibility varies between cultivars, from mild to serious symptoms. Fan leaf shape, mosaic mottling of leaves, malformed shoots and reduced bunch sizes (Habili, et al., 2001) (Wilkox, et al., 2015).	4
Nepovirus C: strawberry latent ringspot virus SLRSV Prohibited – s12 (C1)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via root-feeding nematode vector - *Xiphinema diversicaudatum* (Wilkox, et al., 2015) – which is not present in Australia.	**High:** SLRSV has been reported in association with grapevine degeneration in Europe (Martelli, 1993). SLRSV is difficult to distinguish from GFLV, and produces similar symptoms (Wilkox, et al., 2015).	4

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Nepovirus: tomato ringspot virus ToRSV Associated with Grapevine yellow vein disease Prohibited – s12 (C1)	**Medium/Medium:** Long distance spread occurs via infected propagation material and local dissemination occurs via root-feeding nematodes. ToRSV is transmitted by several nematodes, including *Xiphinema americanum* and *X. rivesi* both of which are present in WA. No evidence to suggest this virus is seed borne in table grapes (Biosecurity Australia, 2005).	**High:** ToRSV causes virus-induced grapevine decline (Martelli, 1993) (Wilkox, et al., 2015). Cultivars vary in level of susceptibility, but symptoms can be: chlorotic mottling, oak leaf pattern, ringspot on leaves. Chronically infected vines may result in bud death, or weak buds - leading to weak shoots and poor bunches. Can also lead to *grapevine yellow vein disease* in warmer regions.	4
Pospiviroid: citrus exocortis viroid CEVd Prohibited – s12 (C1)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means - grafting, abrasion and through seed (Wah, et al., 1997). Host plants listed are cultivated in WA.	**Negligible:** No symptoms of disease observed when CEVd infects grapevine (Hadidi, et al., 2003). Grapevines could represent natural reservoir from which the viroid can potentially be transmitted to other susceptible host crops (El-Dougdoug, et al., 2010).	1
Sobemovirus: sowbane mosaic virus SoMV Unlisted (s14)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means.	**Negligible:** Infection is latent and rare in *Vitis* sp. (Wilkox, et al., 2015)	1

Organism	Establishment/Spread potential	Potential economic consequence	Final pest status
Vitivirus: grapevine B virus GBV Associated with Corky bark disease Unlisted (s14)	**Medium/Medium:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means or mealybug vectors. Not seed transmitted; transmitted by grafting; transmitted by the mealybugs *Pseudococcus longispinus* and *Ps. Viburni*, (Wilkox, et al., 2015) both of which are present in WA.	**Medium:** Associated with Corky bark disease, young grapevine vine decline (disease induced graft incompatibility) (Wilkox, et al., 2015). Infects systemically; probably present in fruit and rachis (Martelli, 1999).	4
Vitivirus: grapevine virus D GVD Unlisted (s14)	**Medium/Low:** Long distance spread occurs via infected propagation material and local dissemination occurs via mechanical means. No reports of natural spread and it is unlikely to be co-transported with a vector insect or to be transmitted from imported fruit to a suitable host plant (DAFF, 2013).	**Low:** Unsubstantiated association with Corky rugose wood (Wilkox, et al., 2015), limited reports of any other symptoms. Infects systemically. There is potential for it to be associated with the vascular tissues in table grape bunches (DAFF, 2013).	3

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