Australian Government

Biosecurity Australia

DRAFT

Revised Draft Import Risk Analysis Report for Table Grapes from Chile

Part A

February 2005

This *Revised Draft Import Risk Analysis Report for Table Grapes from Chile* is produced for consultation and stakeholder comments.

Every effort has been made to ensure that the information provided in this document is true and accurate at the time of publication. A number of factors may affect the accuracy or completeness of this information. These factors include changes in pest and disease status, scientific information, and material continuing to be reviewed by Biosecurity Australia or otherwise provided that is relevant to the final import risk assessment.

This revised draft import risk analysis report for table grapes from Chile should not be relied upon for making any business decisions.

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GLOSSARY OF TERMS AND ABBREVIATIONS

Additional declaration	a statement that is required by an importing country to be entered on a Phytosanitary Certificate and which provides specific additional information pertinent to the phytosanitary condition of a consignment
ALOP	appropriate level of protection
AQIS	Australian Quarantine and Inspection Service
Area	an officially defined country, part of a country or all or parts of several countries
Biosecurity Australia	a prescribed agency within the Australian Government Department of Agriculture, Fisheries and Forestry
Certificate	an official document, which attests to the phytosanitary status of any consignment affected by phytosanitary regulations
Consignment	a quantity of plant, plant products and/or other articles being moved from one country to another and covered, when required, by a single phytosanitary certificate (a consignment may be composed of one or more commodities or lots)
Control (of a pest)	suppression, containment or eradication of a pest population
DAFF	Department of Agriculture, Fisheries and Forestry
Endangered area	an area where ecological factors favour the establishment of a pest whose presence in the area will result in economically important loss
Entry (of a pest)	movement of a pest into an area where it is not yet present, or present but not widely distributed and being officially controlled
Entry potential	Likelihood of the entry of a pest
Establishment	the perpetuation, for the foreseeable future, of a pest within an area after entry
Establishment potential	Likelihood of the entry of a pest
FAO	Food and Agriculture Organization of the United Nations
Fresh	not dried, deep-frozen or otherwise conserved
Host range	species of plants capable, under natural conditions, of suiting a specific pest
ICON	AQIS Import Conditions database
Inspection	official visual inspection of plant, plant products or other regulated articles to determine if pests are present and/or to determine compliance with phytosanitary regulations
Interception (of a pest)	the detection of a pest during inspection or testing of an imported consignment
Introduction (of pest)	entry of a pest resulting in its establishment
Introduction potential	Likelihood of the introduction of a pest

IPPC .... International Plant Protection Convention, as deposited in 1951 with FAO in Rome and as subsequently amended

IRA .... Import Risk Analysis, an administrative process through which quarantine policy is developed or reviewed, incorporating risk assessment, risk management and risk communication

ISPM .... International Standard on Phytosanitary Measures

National Plant Protection Organisation .... official service established by a government to discharge the functions specified by the IPPC (DAFF is Australia's NPPO)

Non-quarantine pest .... pest that is not a quarantine pest for an area

Official .... established, authorised or performed by a National Plant Protection Organisation

Official control (of a regulated pest) .... the active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or for the management of regulated non-quarantine pests

Pathway .... any means that allows the entry, or spread of a pest

PBPM .... Plant Biosecurity Policy Memorandum

Pest .... any species, strain or biotype of plant, animal, or pathogenic agent, injurious to plants or plant products

Pest categorisation .... the process for determining whether a pest has or has not the characteristics of a quarantine pest or those of a regulated non-quarantine pest

Pest-free area .... an area in which a specific pest does not occur as demonstrated by scientific evidence and in which, where appropriate, this condition is being officially maintained

Pest risk analysis .... the process of evaluating biological or other scientific evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it

Pest risk assessment (for quarantine pests) .... evaluation of the probability of the introduction and spread of a pest and of the associated potential economic consequences

Pest risk management (for quarantine pests) .... evaluation and selection of options to reduce the risk of introduction and spread of a pest

Phytosanitary Certificate Certificate patterned after the model certificates of the IPPC

Phytosanitary measure .... any legislation, regulation or official procedure having the purpose to prevent the introduction and/or spread of quarantine pests

PRA	pest risk analysis
PRA area	area in relation to which a pest risk analysis is conducted
Polyphagous	feeding on a relatively large number of host plants from different plant families
Quarantine pest	a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled
Restricted risk	'Restricted' risk estimates are those derived when risk management measures are used
SAG	Servicio Agricola y Ganadero, the NPPO for Chile
SO_2/CO_2	Sulphur dioxide/carbon dioxide
Spread	expansion of the geographical distribution of a pest within an area
Spread potential	likelihood of the spread of a pest
SPS	Sanitary and phytosanitary
SPS Agreement	WTO Agreement on the Application of Sanitary and Phytosanitary Measures
Stakeholders	Government agencies, individuals, community or industry groups or organisations, whether in Australia or overseas, including the proponent/applicant for a specific proposal
Unrestricted risk	'Unrestricted' risk estimates are those derived in the complete absence of risk management measures
WTO	World Trade Organization

EXECUTIVE SUMMARY

This revised draft import risk analysis report proposes that table grapes from Chile be allowed entry into Australia subject to phytosanitary measures for Mediterranean fruit fly, Chilean false red mite, weevils, mealybugs, leafrollers, spiders (as contaminating pests) and plant pests. These pests will require the use of risk management measures in addition to Chile's standard commercial production practices. The proposed risk management measures aim to provide a high level of sanitary and phytosanitary protection that will reduce risk to a very low level, consistent with Australia's appropriate level of protection (ALOP).

In December 1998, Australia initiated an import risk analysis (IRA) for the importation of table grapes from Chile following a request from the Chilean Government for market access in 1995.

The risk assessment identified 27 pests and 12 pest plants as requiring risk management measures to reduce the risk to an acceptable level. A combination of risk management measures and operational systems is proposed to reduce the risk associated with the importation of table grapes from Chile to a level acceptable to Australia (meets Australia's ALOP), specifically:

- pest area status for Mediterranean fruit fly;
- pre-shipment fumigation with SO_2/CO_2 for black widow spider;
- methyl bromide fumigation for Chilean false red mite;
- inspection and remedial action for weevils, mealybugs, and leafrollers; and
- supporting operational systems to maintain and verify phytosanitary status.

Biosecurity Australia circulated the technical issues paper in September 2002 and the draft import risk analysis report in June 2003. Stakeholder comments were considered and, where appropriate, incorporated into this revised draft import risk analysis report.

The *Revised Draft Import Risk Analysis Report* contains the following:

- Australia's framework for biosecurity policy and for import risk analysis, the international framework for trade in plants and plant products; Australia's current policy for importation of table grapes and information on the background to this IRA;
- an outline of the methodology and results of pest categorisation and risk assessment;
- proposed risk management measures;
- draft import conditions for table grapes from Chile;
- further steps in the IRA process; and
- a summary of stakeholder comments received on the draft import risk analysis report and Biosecurity Australia's response.

Detailed risk assessments were conducted for those pests that were categorised as quarantine pests to determine an unrestricted risk estimate for each organism. For those pests for which the unrestricted risk was considered to be above Australia's ALOP, risk management measures have been considered. Consultation with Servicio Agricola y Ganadero (SAG), and input from stakeholders on the draft import conditions has resulted in a set of proposed risk management measures, including their objectives.

Details on these proposed risk management measures, including their objectives, are provided within this revised draft IRA report. Biosecurity Australia invites comments on the technical and economic feasibility of the proposed risk management measures, in particular, comments on their appropriateness and any other measures that stakeholders consider would provide equivalent risk management.

To assist the reader in considering this revised draft IRA report, Biosecurity Australia presents the document in two separate parts, Part A and Part B. Part A includes key components of the risk assessment, the proposed risk management measures and a summary of the stakeholder comments on the draft IRA report and generic responses from Biosecurity Australia. Part B contains detailed technical components of the risk assessment.

1 BIOSECURITY FRAMEWORK

1.1 Introduction

This section outlines:

- The legislative basis for Australia's biosecurity regime;
- Australia's international rights and obligations;
- Australia's Appropriate Level of Protection;
- Import Risk Analysis; and
- Policy determination.

1.2 Australian Legislation

The *Quarantine Act 1908* and its subordinate legislation, including the *Quarantine Proclamation 1998*, are the legislative basis of human, animal and plant biosecurity in Australia.

Some key provisions are set out below.

1.2.1 Quarantine Act: Scope

Section 4 of the *Quarantine Act 1908* defines the scope of quarantine as follows.

In this Act, quarantine includes, but is not limited to, measures:

a) *for, or in relation to:*

   i) the examination, exclusion, detention, observation, segregation, isolation, protection, treatment and regulation of vessels, installations, human beings, animals, plants or other goods or things; or

   ii) *the seizure and destruction of animals, plants, or other goods or things; or*

   iii) *the destruction of premises comprising buildings or other structures when treatment of these premises is not practicable; and*

b) *having as their object the prevention or control of the introduction, establishment or spread of diseases or pests that will or could cause significant damage to human beings, animals, plants, other aspects of the environment or economic activities.*

Section 5D of the *Quarantine Act 1908* covers the level of quarantine risk.

A reference in this Act to a level of quarantine risk is a reference to:

a) *the probability of*

   i) a disease or pest being introduced, established or spread in Australia or the Cocos Islands; and

   ii) the disease or pest causing harm to human beings, animals, plants, other aspects of the environment, or economic activities; and

b) *the probable extent of the harm.*

Section 5D of the *Quarantine Act 1908* includes harm to the environment as a component of the level of quarantine risk. Environment is defined in Section 5 of the Quarantine Act 1908, in that it:

> *includes all aspects of the surroundings of human beings, whether natural surroundings or surroundings created by human beings themselves, and whether affecting them as individuals or in social groupings.*

1.2.2 Quarantine Proclamation

The *Quarantine Proclamation 1998* is made under the *Quarantine Act 1908*. It is the principal legal instrument used to control the importation into Australia of goods of quarantine (or biosecurity) interest. The Proclamation empowers a Director of Quarantine to grant a permit to import.

Section 70 of the *Quarantine Proclamation 1998* sets out the matters to be considered when deciding whether to grant a permit to import:

Things a Director of Quarantine must take into account when deciding whether to grant a permit for importation into Australia

(I) In deciding whether to grant a permit to import a thing into Australia or the Cocos Islands, or for the removal of a thing from the Protected Zone or the Torres Strait Special Quarantine Zone to the rest of Australia, a Director of Quarantine:

- *a) must consider the level of quarantine risk if the permit were granted; and*
- *b) must consider whether, if the permit were granted, the imposition of conditions on it would be necessary to limit the level of quarantine risk to one that is acceptably low; and*
- *(ba) for a permit to import a seed of a kind of plant that was produced by genetic manipulation -- must take into account any risk assessment prepared, and any decision made, in relation to the seed under the Gene Technology Act; and*
- *c) may take into account anything else that he or she knows that is relevant.*

1.2.3 Development of Biosecurity Policy

As can be seen from the above extracts, the legislation establishes the concept of the level of biosecurity (quarantine) risk as the basis of decision-making under Australian quarantine legislation.

Import risk analyses are a significant contribution to the information available to the Director of Animal and Plant Quarantine - a decision maker for the purposes of the Quarantine Proclamation. Import risk analysis is conducted within an administrative process – known as the IRA process (described in the *IRA Handbook*[1]).

The purpose of the IRA process is to deliver a policy recommendation to the Director of Animal and Plant Quarantine that is characterised by sound science, transparency, fairness and consistency. The key elements of the IRA process are covered in “Import Risk Analysis” below.

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[1] Biosecurity Australia (2003) *Import Risk Analysis Handbook*. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra

1.3 Australia’s International Rights and Obligations

It is important that import risk analyses conform to Australia’s rights and obligations as a World Trade Organization (WTO) Member country. These rights and obligations derive principally from the WTO’s *Agreement on the Application of Sanitary and Phytosanitary Measures* (SPS Agreement), although other WTO agreements may also be relevant. Specific international guidelines on risk analysis developed under the International Plant Protection Convention (IPPC) and by the Office International des Epizooties (OIE) are also relevant.

The SPS Agreement recognises the right of WTO Member countries to determine the level of sanitary and phytosanitary protection they deem appropriate, and to take the necessary measures to achieve that protection. Sanitary (human and animal health) and phytosanitary (plant health) measures typically apply to trade in, or movement of, animal and plant based goods within or between countries. The SPS Agreement applies to measures that may directly or indirectly affect international trade and that protect human, animal or plant life or health from pests and diseases or a Member’s territory from a pest.

The SPS Agreement provides for the following:

- The right of WTO Member countries to determine the level of sanitary and phytosanitary protection (its appropriate level of protection, or ALOP) they deem appropriate;
- An importing Member has the sovereign right to take measures to achieve the level of protection it deems appropriate to protect human, animal or plant life or health within its territory;
- An SPS measure must be based on scientific principles and not be maintained without sufficient scientific evidence;
- An importing Member shall avoid arbitrary or unjustifiable distinctions in levels of protection, if such distinctions result in discrimination or a disguised restriction on international trade;
- An SPS measure must not be more trade restrictive than required to achieve an importing Member’s ALOP, taking into account technical and economic feasibility;
- An SPS measure should be based on an international standard, guideline or recommendation where these exist, unless there is a scientific justification for a measure which results in a higher level of SPS protection to meet the importing Member’s ALOP;
- An SPS measure conforming to an international standard, guideline or recommendation is deemed to be necessary to protect human, animal or plant life or health, and to be consistent with the SPS Agreement;
- Where an international standard, guideline or recommendation does not exist or where, in order to meet an importing Member’s ALOP, a measure needs to provide a higher level of protection than accorded by the relevant international standard, such a measure must be based on a risk assessment; the risk assessment must take into account available scientific evidence and relevant economic factors;
- Where the relevant scientific evidence is insufficient, an importing Member may provisionally adopt SPS measures on the basis of available pertinent information. In such circumstances, Members shall seek to obtain the additional information necessary

for a more objective assessment of risk and review the SPS measure accordingly within a reasonable period of time;

- An importing Member shall accept the measures of other countries as equivalent, if it is objectively demonstrated that the measures meet the importing Member's ALOP.

1.4 Australia's Appropriate Level of Protection (ALOP)

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

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

ALOP can be illustrated using a 'risk estimation matrix' (Table 1). The cells of this matrix describe the product of likelihood[2] and consequences — termed 'risk'. When interpreting the risk estimation matrix, it should be remembered that, although the descriptors for each axis are similar ('low', 'moderate', 'high', etc.), the vertical axis refers to *likelihood* and the horizontal axis refers to *consequences*.

Table 1: Risk estimation matrix

Likelihood of entry, establishment or spread						
High likelihood	Negligible risk	Very low risk	Low risk	Moderate risk	High risk	Extreme risk
Moderate	Negligible risk	Very low risk	Low risk	Moderate risk	High risk	Extreme risk
Low	Negligible risk	Negligible risk	Very low risk	Low risk	Moderate risk	High risk
Very low	Negligible risk	Negligible risk	Negligible risk	Very low risk	Low risk	Moderate risk
Extremely low	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Very low risk	Low risk
Negligible likelihood	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Negligible risk	Very low risk
	Negligible impact	*Very low*	*Low*	*Moderate*	*High*	*Extreme impact*
	Consequences of entry, establishment or spread					

The band of cells in Table 1 marked 'very low risk' represents Australia's ALOP, or tolerance of loss.

[2] The terms "likelihood" and "probability" are synonymous. "Probability" is used in the *Quarantine Act 1908* while "likelihood" is used in the WTO SPS Agreement. These terms are used interchangeably in this IRA report.

1.4.1 Risk management and SPS measures

Australia's plant and animal health status is maintained through the implementation of measures to facilitate the importation of products while protecting the health of people, animals and plants.

Australia bases its national measures on international standards where they exist and where they deliver the appropriate level of protection from pests and diseases. However, where such standards do not achieve Australia's level of biosecurity protection, or relevant standards do not exist, Australia exercises its right under the SPS Agreement to take appropriate measures, justified on scientific grounds and supported by risk analysis.

Australia's approach to addressing requests for imports of animals, plants and their products where there are biosecurity risks is, where appropriate, to draw on existing sanitary and phytosanitary measures for similar products with comparable risks. However, where measures for comparable biosecurity risks have not previously been established, further action would be required to assess the risks to Australia and determine the sanitary and phytosanitary measures needed to achieve Australia's ALOP.

1.5 Import Risk Analysis

1.5.1 Description

In animal and plant biosecurity, an import risk analysis identifies the pests and diseases relevant to an import proposal, assesses the risks posed by them and, if those risks are unacceptable, specifies the measures that could be taken to reduce those risks to an acceptable level. These analyses are conducted via an administrative process (described in the *IRA Handbook*) that involves, among other things, notification to the WTO, consultation and appeal.

1.5.2 Undertaking IRAs

Biosecurity Australia may undertake an IRA if:

- there is no relevant existing biosecurity measure for the good and pest/disease combination; or
- a variation in established policy is desirable because pests or diseases, or the likelihood and/or consequences of entry, establishment or spread of the pests or diseases could differ significantly from those previously assessed.

1.5.3 Environment and human health

When undertaking an import risk analysis, Biosecurity Australia takes into account harm to the environment as part of its assessment of biosecurity risks associated with the potential import.

Under the *Environment Protection and Biodiversity Conservation Act 1999*, Environment Australia may assess proposals for the importation of live specimens and their reproductive material. Such an assessment may be used, or referred to, by Biosecurity Australia in its analyses.

Biosecurity Australia also consults with other Commonwealth agencies where they have responsibilities relevant to the subject matter of the IRA, e.g. Food Standards Australia New Zealand (FSANZ) and the Department of Health and Ageing.

1.5.4 The IRA process in summary

The process consists of the following major steps:

Initiation: This is the stage where the identified need for an IRA originates.

Scheduling and Scoping: At this stage, Biosecurity Australia considers all the factors that affect scheduling. Consultation with States, Territories and other Commonwealth agencies is involved. There is opportunity for appeal by stakeholders at this stage.

Risk Assessment and Risk Management: Here, the major scientific and technical work relating to risk assessment is performed. There is detailed consultation with stakeholders.

Reporting: Here, the results of the IRA are communicated formally. There is consultation with States and Territories. The Interim Chief Executive of Biosecurity Australia then delivers the biosecurity policy recommendation arising from the IRA to the Director of Animal and Plant Quarantine. There is opportunity for appeal by stakeholders at this stage.

1.6 Policy Determination

The Director of Animal and Plant Quarantine makes the policy determination, which is notified publicly.

2 METHOD FOR PEST RISK ANALYSIS

The technical component of an IRA for plants or plant products is termed a 'pest risk analysis' or PRA. Biosecurity Australia conducts PRA in accordance with the International Standards for Phytosanitary Measures Publication Number 11 *Pest Risk Analysis for Quarantine Pests including Analysis of Environmental Risks and Living Modified Organisms* (ISPM 11). A summary of the requirements of ISPM 11 is given in this section plus descriptions of the methodology used to meet these requirements in this IRA. This summary is given to provide a description of the methodology used for this IRA and to provide a context for the technical information that is provided later in this document.

A PRA comprises three discrete stages:

- Stage 1: initiation of the PRA.
- Stage 2: pest risk assessment.
- Stage 3: pest risk management.

The *initiation* of a risk analysis involves the identification of the pest(s) and pathways of concern that should be considered for analysis. *Risk assessment* comprises pest categorisation, assessment of the probability of introduction and spread, and assessment of the potential economic consequences (including environmental impacts). *Risk management* describes the evaluation and selection of options to reduce the risk of introduction and spread of a pest.

2.1 Stage 1: initiation of the PRA

This PRA was initiated in November 1998 by the market access request from the Chilean Agriculture Service (Servicio Agricola y Ganadero, SAG) in 1995 to export commercially produced table grapes from Chile into Australia for human consumption.

A list of pests likely to be associated with table grapes from Chile (i.e. the biosecurity risk pathway) was generated from information supplied by SAG, literature searches and database searches. This list was used in this PRA.

The aim of the initiation stage is to identify the pest(s) and pathways (e.g. commodity imports) which are of quarantine concern and should be considered for risk analysis in relation to the identified PRA area.

The "PRA area" is defined in this PRA as Australia or in the case of regional quarantine pests the "PRA area" is defined by as the area of Australia that has regional freedom from the pest. The "endangered area" is defined as any area within Australia, where susceptible hosts are present, and in which ecological factors favour the establishment of a pest that might be introduced in association with table grapes from Chile.

2.2 Stage 2: pest risk assessment

Risk assessment describes the process of identifying pests of biosecurity concern, and estimating the risk (the probability of entry, establishment or spread, and the magnitude of the potential consequences) associated with each.

This pest risk assessment was carried out in accordance with IPPC standards and reported in the following steps:

- pest categorisation;
- assessment of probability of entry, establishment or spread; and
- assessment of potential consequences (including environmental impacts).

Pest risk assessment needs to be only as complex as is technically justified by the circumstances. ISPM 11 allows a specific PRA to be judged against the principles of necessity, minimal impact, transparency, equivalence, risk analysis, managed risk and non-discrimination.

2.2.1 Pest categorisation

Pest categorisation is a process to examine, for each pest, whether the criteria for a quarantine pest are satisfied. That is, whether the pests identified in Stage 1 (Initiation of the PRA) are 'quarantine pests' or not.

As stated in ISPM 11, a 'quarantine pest' is a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled. An 'endangered area' is an area where ecological factors favour the establishment of a pest whose presence in the area will result in economically important loss. Under IPPC and FAO terminology, 'official control' means the active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or the management of regulated non-quarantine pests.

On the basis of these definitions, the process of pest categorisation is summarised by the IPPC in the five elements outlined below:

- *Identity of the pest*. The identity of the pest should be clearly defined to ensure that the assessment is being performed on a distinct organism, and that biological and other information used in the assessment is relevant to the organism in question. If this is not possible because the causal agent of particular symptoms has not yet been fully identified, then it should have been shown to produce consistent symptoms and to be transmissible.

  The taxonomic unit for the pest is generally species. The use of a higher or lower taxonomic level should be supported by scientifically sound rationale. For levels below the species, this should include evidence demonstrating that factors such as differences in virulence, host range or vector relationships are significant enough to affect phytosanitary status.

  Where a vector is involved, the vector may also be considered a pest to the extent that it is associated with the causal organism and is required for transmission of the pest.

- *Presence or absence in the endangered area.* The pest should be absent from all or part of the endangered area.
- *Regulatory status.* If the pest is present but not widely distributed in the PRA area, it should be under official control or be expected to be under official control in the near future.
- *Potential for establishment and spread in the PRA area.* Evidence should be available to support the conclusion that the pest could become established or spread in the PRA

area. The PRA area should have ecological/climatic conditions including those in protected conditions suitable for the establishment and spread of the pest where relevant, host species (or near relatives), alternate hosts and vectors should be present in the PRA area.

- *Potential for economic consequences in the endangered area.* There should be clear indication that the pest is likely to have an unacceptable economic impact (including environmental impact) in the PRA area.

Pest categorisation was conducted in two stages for this IRA.

- The Technical Issues Paper for this IRA was released in September 2002 with a list of pests of table grapes categorised according to the presence or absence of each pest in Australia, and the association of each pest with table grape clusters.
- The second stage of pest categorisation was documented in the draft IRA report. This stage was based on the categorisation of each pest absent from Australia or clearly defined regions within Australia and associated with table grape clusters according to (a) its potential to become established or spread in Australia, and, (b) the potential for economic consequences. Categorisation of establishment or spread potential and potential for economic consequences was dichotomous, and expressed using the terms ‘feasible’ / ‘not feasible’, and ‘significant’ / ‘not significant’, respectively.

This revised draft IRA report has been scientifically reviewed and re-issued for stakeholder comment. This revised draft IRA report presents the results of the risk assessment and proposed risk management for those pests determined to be above Australia’s ALOP.

2.2.2 Assessment of the probability of entry, establishment or spread

Details on assessing the ‘probability of entry’, ‘probability of establishment’ and ‘probability of spread after establishment’ of a pest are given in ISPM 11. A synopsis of these details is given below, followed by a description of the qualitative methodology used in this IRA.

2.2.2.1 Probability of entry

The ‘probability of entry’ describes the probability that a quarantine pest will enter Australia as a result of trade in a given commodity, be distributed in a viable state to an endangered area and subsequently be transferred to a suitable host.

Steps identified in ISPM 11 relevant to PRA initiated by a pathway are:

- *Probability of the pest being associated with the pathway at origin* – e.g. prevalence in the source area, occurrence of life stages that would be associated with the commodity, volume and frequency of movement along the pathway, seasonal timing, pest management, cultural and commercial procedures applied at the place of origin;
- *Probability of survival during transport or storage* – e.g. speed and conditions of transport and duration of the lifecycle, vulnerability of the life-stages during transport or storage, prevalence of the pest, effects of commercial procedures applied;
- *Probability of pest surviving existing pest management procedures*; and
- *Probability of transfer to a suitable host* – e.g. dispersal mechanisms, whether the imported commodity is sent to few or many destination points in the PRA area, time of

year at which import takes place, intended use of the commodity, risks from by-products and waste.

The probability of entry may be divided for administrative purposes into the following components:

The probability of importation: the probability that a pest will arrive in Australia when a given commodity is imported; and

The probability of distribution: the probability that the pest will be distributed (as a result of the processing, sale or disposal of the commodity) to the endangered area, and subsequently be transferred to a suitable site on a susceptible host.

In breaking down the probability of entry into these two components, Biosecurity Australia has not altered the original meaning. The two components have been identified and separated to enable onshore and offshore pathways to be described individually.

The probability of importation and the probability of distribution are obtained from pathway scenarios depicting necessary steps in: the sourcing of the commodity for export; its processing, transport and storage; its utilisation in Australia; and the generation and disposal of waste.

2.2.2.2 Probability of establishment

In order to estimate the probability of establishment of a pest, reliable biological information (life cycle, host range, epidemiology, survival, etc.) should be obtained from the areas where the pest currently occurs. The situation in the PRA area can then be compared with that in the areas where it currently occurs and expert judgement used to assess the probability of establishment. Examples provided in ISPM 11 of factors to consider are:

- Availability, quantity and distribution of hosts in the PRA area;
- Environmental suitability in the PRA area;
- Potential for adaptation of the pest;
- Reproductive strategy of the pest;
- Method of pest survival; and
- Cultural practices and control measures.

2.2.2.3 Probability of spread after establishment

In order to estimate the probability of spread of the pest, reliable biological information should be obtained from areas where the pest currently occurs. The situation in the PRA area can then be carefully compared with that in the areas where the pest currently occurs and expert judgement used to assess the probability of spread. Examples provided in ISPM 11 of factors to consider are:

- Suitability of the natural and/or managed environment for natural spread of the pest;
- Presence of natural barriers;
- The potential for movement with commodities or conveyances;
- Intended use of the commodity;
- Potential vectors of the pest in the PRA area; and
- Potential natural enemies of the pest in the PRA area.

2.2.3 Method for evaluating the probability of entry, establishment or spread

Evaluation and reporting of likelihoods can be done qualitatively, semi-quantitatively or quantitatively. For qualitative evaluation, likelihoods assigned to steps in the scenarios are categorised according to a descriptive scale – e.g. ‘low’, ‘moderate’, ‘high’, etc. – where no attempt has been made to equate descriptors with numeric values or scores. For semi-quantitative evaluation, likelihoods are given numeric ‘scores’ (e.g. 1, 2, 3), or probabilities and/or probability intervals (e.g. 0–0.0001, 0.0001–0.001, 0.001-0.01, 0.01-1). For quantitative evaluation, likelihoods are described in purely numeric terms.

Each of these three approaches to likelihood evaluation has its advantages and constraints and the choice of approach depends on both technical and practical considerations. For this IRA, likelihood was evaluated and reported qualitatively using the terms described in Table 2.

Table 2: Nomenclature for qualitative likelihoods

Likelihood	Descriptive definition
High	The event would be very likely to occur
Moderate	The event would occur with an even probability
Low	The event would be unlikely to occur
Very low	The event would be very unlikely to occur
Extremely low	The event would be extremely unlikely to occur
Negligible	The event would almost certainly not occur

Qualitative likelihoods can be assigned to individual steps or to the probability that all the steps will occur. If the likelihoods have been assigned to individual steps then some form of ‘combination rule’ is needed for calculating the probability that all steps will occur. For this IRA the likelihoods were combined using a tabular matrix, as shown in Table 3.

Table 3: Matrix of rules for combining descriptive likelihoods

	High	Moderate	Low	V. Low	E. Low	Negligible
High	High	Moderate	Low	V. Low	E. Low	Negligible
Moderate		Low	Low	V. Low	E. Low	Negligible
Low			V. Low	V. Low	E. Low	Negligible
Very low				E. Low	E. Low	Negligible
E. low					Negligible	Negligible
Negligible						Negligible

In this IRA, qualitative likelihoods were assigned to the probability of entry (comprising an importation step and a distribution step), the probability of establishment and the probability of spread. In other IRAs it may be considered relevant to assign qualitative likelihoods to additional steps. This would depend on the complexity of the issue and the information that was available. For example, within the importation step, separate qualitative likelihoods could be assigned to the probabilities that source fruit is infested, that the pest survives packinghouse procedures and that it survives storage and transport.

The procedure for combining likelihoods is illustrated in Table 4. The example assigns hypothetical values to the probability of importation (low) and the probability of distribution (moderate), which are then combined to give the probability of entry (low). The likelihoods are combined using the 'rules' provided in Table 3. The probability of entry is then combined with hypothetical likelihoods assigned to the probability of establishment (high) and probability of spread (very low) to give the overall probability of entry, establishment or spread (very low).

Table 4: Qualitative evaluation of the imported fruit scenario

Step	Qualitative descriptor	Product of likelihoods
Probability of importation	Low	
Probability of distribution	Moderate	
➔ Probability of entry	➔	Low
Probability of establishment	High ➔	Low
Probability of spread	Very low	
➔ Probability of entry, establishment and spread	➔	Very low

2.2.4 Assessment of consequences

The basic requirements for the assessment of consequences are described in the SPS Agreement, with Article 5.3 stating that:

"Members shall take into account as relevant economic factors: the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks"

Assessment of consequences is also referred to in Annex A of the SPS Agreement in the definition of risk assessment:

"The evaluation of the likelihood of entry, establishment or spread of a pest or disease within the Territory of an importing Member according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences"

Further detail on assessing these "relevant economic factors" or "associated potential biological and economic consequences" for plant-based analysis is given under the "potential economic consequences" section in ISPM 11. This ISPM separates the consequences into "direct" and "indirect" and provides examples of factors to consider within each. These examples are listed below under the headings where they may be considered in an IRA. This is followed by a description of the methodology used in this IRA.

In this IRA, the term "consequence" is used to reflect the "relevant economic factors", "associated potential biological and economic consequences" and "potential economic consequences" terms as used in the SPS Agreement and ISPM 11 respectively.

2.2.4.1 Direct pest effects

Plant life or health

ISPM 11 provides the following examples that could be considered for the direct consequences on plant life or health:

- Known or potential host plants;
- Types, amount and frequency of damage;
- Crop losses, in yield and quality;
- Biotic factors (e.g. adaptability and virulence of the pest) affecting damage and losses;
- Abiotic factors (e.g. climate) affecting damage and losses;
- Rate of spread;
- Rate of reproduction;
- Control measures (including existing measures), their efficacy and cost;
- Effect of existing production practices; and
- Environmental effects.

Any other aspects of the environment

ISPM 11 provides the following examples that could be considered for the direct consequences on any other aspects of the environment:

- Environmental effects (listed as a general example in ISPM 11);
- Reduction of keystone plant species;
- Reduction of plant species that are major components of ecosystems (in terms of abundance or size), and endangered native plant species (including effects below species level where there is evidence of such effects being significant); and
- Significant reduction, displacement or elimination of other plant species.

2.2.4.2 Indirect pest effects

Eradication, control, etc.

ISPM 11 provides the following examples that could be considered for the indirect consequences on eradication, control, etc.:

- Changes to producer costs or input demands, including control costs;
- Feasibility and cost of eradication or containment;
- Capacity to act as a vector for other pests; and
- Resources needed for additional research and advice.

Domestic trade and International trade

ISPM 11 provides the following examples that could be considered for the indirect consequences on domestic and international trade (the two are considered separately):

- Effects on domestic and export markets, including particular effects on export market access; and
- Changes to domestic or foreign consumer demand for a product resulting from quality changes.

Environment

ISPM 11 provides the following examples that could be considered for the indirect consequences on the environment:

- Environmental and other undesired effects of control measures;
- Social and other effects (e.g. tourism);
- Significant effects on plant communities;
- Significant effects on designated environmentally sensitive or protected areas;
- Significant change in ecological processes and the structure, stability or processes of an ecosystem (including further effects on plant species, erosion, water table changes, increased fire hazard, nutrient cycling, etc.);
- Effects on human use (e.g. water quality, recreational uses, tourism, animal grazing, hunting, fishing); and
- Costs of environmental restoration.

2.2.5 Method for assessing consequences in this IRA

The relevant examples of direct and indirect consequences from ISPM 11 are considered for each of the broad groups (as listed above) and estimates of the consequences are assigned. The broad groups are shown in table form in the 'Risk Assessments for Quarantine Pests' section of this document.

The direct and indirect consequences were estimated based on four geographic levels. The terms 'local', 'district', 'regional' and 'national' are defined as:

Local: an aggregate of households or enterprises — e.g. a rural community, a town or a local government area.

District: a geographically or geopolitically associated collection of aggregates — generally a recognised section of a state, such as the 'North West Slopes and Plains' or 'Far North Queensland'.

Region: a geographically or geopolitically associated collection of districts — generally a state, although there may be exceptions with larger States such as Western Australia.

National: Australia-wide.

The consequence was described as 'unlikely to be discernible', of 'minor significance', significant' or 'highly significant':

- an '*unlikely to be discernible'* consequence is not usually distinguishable from normal day-to-day variation in the criterion.
- a consequence of '*minor significance*' is not expected to threaten economic viability, but would lead to a minor increase in mortality/morbidity or a minor decrease in production. For non-commercial factors, the consequence is not expected to threaten the intrinsic 'value' of the criterion — though the value of the criterion would be considered as 'disturbed'. Effects would generally be reversible.
- a '*significant'* consequence would threaten economic viability through a moderate increase in mortality/morbidity, or a moderate decrease in production. For non-commercial factors, the intrinsic 'value' of the criterion would be considered as significantly diminished or threatened. Effects may not be reversible.

- a '*highly significant*' consequence would threaten economic viability through a large increase in mortality/morbidity, or a large decrease in production. For non-commercial factors, the intrinsic 'value' of the criterion would be considered as severely or irreversibly damaged.

The values were translated into a qualitative score (A–F) using the schema outlined in Table 5.

Table 5: The assessment of local, district, regional and national consequences

Impact score	Local	District	Regional	National
F	-	-	-	Highly significant
E	-	-	Highly significant	Significant
D	-	Highly significant	Significant	Minor
C	Highly significant	Significant	Minor	Unlikely to be discernible
B	Significant	Minor	Unlikely to be discernible	Unlikely to be discernible
A	Minor	Unlikely to be discernible	Unlikely to be discernible	Unlikely to be discernible
	Local	*District*	*Regional*	*National*

Level

The overall consequence for each pest was achieved by combining the qualitative scores (A–F) for each direct and indirect consequence using a series of decision rules. These rules are mutually exclusive, and are addressed in the order that they appear in the list — for example, if the first rule does not apply, the second rule is considered. If the second rule does not apply, the third rule is considered and so on until one of the rules applied:

- Where the consequences of a pest with respect to any direct or indirect criterion is 'F', the overall consequences are considered to be 'extreme'.
- Where the consequences of a pest with respect to more than one criterion is 'E', the overall consequences are considered to be 'extreme'.
- Where the consequences of a pest with respect to a single criterion is 'E' and the consequences of a pest with respect to each remaining criterion is 'D', the overall consequences are considered to be 'extreme'.
- Where the consequences of a pest with respect to a single criterion is 'E' and the consequences of a pest with respect to remaining criteria is not unanimously 'D', the overall consequences are considered to be 'high'.
- Where the consequences of a pest with respect to all criteria is 'D', the overall consequences are considered to be 'high'.
- Where the consequences of a pest with respect to one or more criteria is 'D', the overall consequences are considered to be 'moderate'.
- Where the consequences of a pest with respect to all criteria is 'C', the overall consequences are considered to be 'moderate'.
- Where the consequences of a pest with respect to one or more criteria is considered 'C', the overall consequences are considered to be 'low'.
- Where the consequences of a pest with respect to all criteria is 'B', the overall consequences are considered to be 'low'.

- Where the consequences of a pest with respect to one or more criteria is considered 'B', the overall consequences are considered to be 'very low'.
- Where the consequences of a pest with respect to all criteria is 'A', the overall consequences are considered to be 'negligible'.

2.2.6 Method for risk assessment for pest plants in this IRA

The methodology used in this IRA for the risk assessment of pest plants is different from the methodology described above for other pests (i.e. arthropod, fungi, bacteria). Specific consideration of pest plants within IRAs is required only for certain commodities where it is considered feasible that pest plants would commonly be associated with the pathway. A description of the methodology, which meets the requirements of the ISPM 11, for pest plants is presented below.

Consideration of the distribution and status in Australia of each plant species in this IRA was based on established policy and any existing requirements for the importation of each plant species. The risk assessment took into account for each plant species its status as a pest plant and whether it has been considered before. The methodology also considers State and Territory legislation. Plant species that are under official control in an Australian State or Territory are recognised by the Commonwealth.

Consideration of the pathway association of the pest plants was based on the technical factors listed below. This assessment focussed on the dispersal mechanisms of the seeds and the likelihood of seed physically attaching to a grape cluster.

i) The preferred/likely habitat of each species and whether that corresponds with the likely habitat of Chilean vineyards;

ii) The time of year when seeds are produced, the length of time that seeds remain in the area of production and whether seeds will be present during the Chilean grape production period;

iii) The morphology of seed (i.e. do they possess an awn, bristled fruit, etc.) and whether seeds are likely to physically attach to grape bunches;

iv) The dispersal mechanisms of each species; and

v) The crops/areas that the species is reportedly associated with throughout the world, and whether this species is known to be associated with vineyards.

Where available, information on these technical factors was collated for each species. Specific information on the occurrence and phenology of the species in Chile was not always available so approximations were made from the available information. The assessment of the potential for each species to establish or spread was based on the following technical questions:

1) Is the pest plant likely to enter Australia via a Chilean grape bunch?
2) Once the pest plant has entered Australia, is it likely to establish?
3) Once the pest plant has established in Australia, is it likely to spread to other areas?

Each question must be assessed as a "yes" for the assessment to proceed to the next question and all three questions must be assessed as a "yes" for a pest plant to be considered as of potential quarantine concern.

Biosecurity Australia views the potential economic consequence for all pest plants as significant (as opposed to non-significant). Pest plants are recorded to cause economic losses in agricultural systems, especially when diseases or herbicide resistant strains of the pest plants are introduced. For example, pest plants in crops and pastures are estimated to cost the Australian industry $4 billion annually (Hussey *et al*., 1997). Furthermore, pest plants are known to reduce the health of Australia's natural ecosystems, which not only has implications for the natural diversity of fauna and flora, but may also have indirect consequences such as reducing the economic value of tourism in the area where the pest plant infestations occur. Comprehensive discussion on the impact of pest plants on agriculture and the environment in general is provided in Holm *et al.* (1996).

Hence, when combined with 'significant' potential economic consequences, species that progressed through the assessment of establishment or spread are the quarantine pest plants for this IRA.

2.2.7 Method for determining the unrestricted risk estimate

The unrestricted risk estimate for each pest is determined by combining the likelihood estimates of entry, of establishment and of spread with the overall expected consequences, using a risk estimation matrix (Table 1). The unrestricted risk is then compared with Australia's ALOP to determine the need for appropriate risk management measures. Australia's ALOP is represented in this matrix by the row of cells marked 'very low risk'.

2.3 Stage 3: pest risk management

Risk management describes the process of identifying and implementing measures to manage risks so as to achieve Australia's appropriate level of protection, or tolerance for loss, while ensuring that any negative effects on trade are minimised.

To implement risk management appropriately, it is necessary to formalise the difference between 'unrestricted' and 'restricted' risk estimates. Unrestricted risk estimates are those derived in the absence of specific risk management measures, or following only internationally accepted baseline risk management procedures. By contrast, restricted or mitigated risk estimates are those derived when 'risk management' is applied. In the case of this IRA report, unrestricted risk is the risk associated with fruit produced to the standard achieved through normal practices of production, quality control, packing, transport and shipment from the specified areas, as described in documentation provided by SAG-Chile.

The conclusions from pest risk assessment are used to decide whether risk management is required and if so, the strength of measures to be used. Since zero-risk is not a reasonable option, the guiding principle for risk management is to manage risk to achieve the required degree of safety that can be justified and is feasible within the limits of available options and resources.

The unrestricted risk estimate is determined by the examination of the outputs of the assessments of the probability of entry, establishment or spread and the consequence. If the risk is found to be unacceptable, then the first step in risk management is to identify possible phytosanitary measures that will reduce the risk to, or below, an acceptable level.

ISPM 11 provides details on the identification and selection of appropriate risk management options and notes that the choice of measures should be based on their effectiveness in reducing the probability of introduction of the pest.

Examples given of measures commonly applied to traded commodities include:

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

The result of the pest risk management procedure will be either that no measures are identified which are considered appropriate or the selection of one or more management options that have been found to lower the risk associated with the pest(s) to an acceptable level. These management options form the basis of phytosanitary regulations or requirements.

2.3.1 Method for pest risk management in this IRA

The requirement for risk management is determined by comparing the unrestricted risk estimate for each pest with Australia's ALOP. Where the estimate of unrestricted risk does not exceed Australia's ALOP, risk management is not required. Where the unrestricted risk estimate exceeds Australia's ALOP, risk management measures are required to reduce the risk to an acceptable level.

Using the risk estimation matrix, risk management measures are required when the unrestricted risk estimate is low, moderate, high or extreme. Risk management measures are not required when the unrestricted risk estimate is very low or negligible.

Risk management measures were identified for each pest as required and are presented in the Risk Management section of this document. The proposed phytosanitary regulations based on these measures are presented in the Draft Import Conditions section of this document.

3 PROPOSAL TO IMPORT TABLE GRAPES FROM CHILE

3.1 Background

In December 1998, Australia initiated an import risk analysis (IRA) for the importation of table grapes from Chile following a request from the Chilean Government for market access in 1995.

Biosecurity Australia notified stakeholders of the availability of a technical issues paper (TIP) for this IRA in PBPM 2002/40 of 6 September 2002, and invited stakeholder comments. The TIP included background to the IRA and preliminary results of pest categorisation. Biosecurity Australia considered stakeholder comments on the TIP in the preparation of the draft IRA report.

The draft IRA report summarised the information provided in the TIP and also included the full pest risk assessment, the proposed risk management measures and the draft import conditions.

Biosecurity Australia notified stakeholders of the availability of a draft IRA report in PBPM 2003/15 of 13 June 2003, and invited stakeholder comments.

Biosecurity Australia received comments from 7 stakeholders on the draft IRA report. Stakeholder comments were considered and incorporated into this revised draft IRA report where appropriate.

In December 2004, the Australian Government announced Biosecurity Australia had been established as a prescribed Agency within the Department of Agriculture, Fisheries and Forestry (DAFF). Furthermore, the Australian Government reconfirmed an earlier election commitment that all IRAs currently in progress will be reviewed and reissued for stakeholder consultation and comment, to further emphasise the rigour and transparency of Australia’s science based quarantine policy. This revised draft IRA report has been reviewed and is now available for stakeholder comment.

3.2 Administration

3.2.1 Timetable

The section “Further steps in the Import Risk Analysis process” presented later in this report lists the steps for completion of this IRA.

3.2.2 Scope

This IRA considers quarantine risks that may be associated with the importation of clusters (bunches) of table grapes (*Vitis vinifera* L.) into Australia from Chile for human consumption. In this IRA, table grapes are defined as ‘table grape clusters’, which include peduncles, laterals, rachis, pedicels and berries but no other plant parts. The produce will have been cultivated, harvested, packed and transported to Australia under standard commercial conditions in Chile.

3.3 Australia's Current Quarantine Policy for Imports of Table Grapes

3.3.1 International policy

Fresh table grapes may be imported into Australia (except for Western Australia[3]) from New Zealand and the USA (California) for human consumption subject to specific import conditions. Further details of the import requirements for table grapes are available at the ICON website http://www.aqis.gov.au/icon.

3.3.2 Domestic arrangements

The Commonwealth Government is responsible for regulating the movement of plants and plant products into and out of Australia. However, the State and Territory governments are primarily responsible for plant health controls within Australia. Legislation relating to resource management or plant health may be used by State and Territory government agencies to control interstate movement of plants and their products.

3.3.2.1 New South Wales

Under the *Plant Diseases Act 1924* (P28, Gazette No. 154, 18 November 1994), NSW Agriculture prohibits the introduction into NSW (and specified portions) of any part of the plant genus *Vitis*, including its fruit, and any used vineyard-related machinery on account of phylloxera (*Daktulospharia vitifolii*) unless written consent is given by an authorised person, it is accompanied by a plant health certificate, is appropriately inspected and transported as directed.

The movement of any part of the plant genus *Vitis*, or anything likely to spread phylloxera, from phylloxera-infected areas of NSW is also prohibited. These requirements do not prohibit the introduction or movement of packaged fresh fruit, packaged dried fruit, or fruit processed into juice or wine being free from all shoots, leaves, canes or other plant residue or soil. NSW consequently has no specific restrictions on the movement of packaged fresh table grapes from within NSW or interstate.

3.3.2.2 Northern Territory

Table grapes are permitted entry into the Northern Territory subject to appropriate measures for fruit flies (*Bactrocera musae* [banana fruit fly], *Bactrocera cucumis* [cucumber fruit fly] and *Ceratitis capitata* [Mediterranean fruit fly]). Unless a fruit fly outbreak involving production areas is current in the relevant State, commercial consignments with packaging identifying them as grown in Victoria, South Australia or Tasmania are exempt from certification requirements. NSW is also exempt except for cucumber fruit fly certification. Certification for the relevant measure is required (area freedom, cold storage, post harvest insecticide treatment or methyl bromide fumigation).

3.3.2.3 Queensland

Part 8 of the *Plant Protection Regulation 2002* details Queensland's restrictions in relation to grape phylloxera. The whole of the State of Queensland is declared to be a pest

3 Imports will not be permitted into the State of Western Australia. State Legislation in Western Australia currently prohibits the importation of fresh table grapes from areas where downy mildew disease occurs, including other States and Territories of Australia.

quarantine area for grape phylloxera and restrictions apply on the introduction of this pest, grape plants and plant products, and appliances or other items that have been in contact with the plant or soil on which the plant has been growing. These restrictions do not apply to fruit that is packed in a fresh state for human consumption (i.e. table grapes).

3.3.2.4 South Australia

For table grapes to enter South Australia, the Plant Quarantine Standard of South Australia requires freedom from *phylloxera*, and either area freedom from fruit flies or disinfestation by cold storage. Citrus red mite (*Panonychus citri*), European red mite (*Panonychus ulmi*), phylloxera and western flower thrips (*Frankliniella occidentalis*) are all declared pests under the *Fruit and Plant Protection Act 1992.*

3.3.2.5 Tasmania

Table grapes are permitted entry into Tasmania subject to appropriate measures for fruit flies (area freedom, fumigation or cold disinfestation) and certification that they were sourced from outside a 40km radius of any land on which grape phylloxera is known to occur.

3.3.2.6 Victoria

Under the *Plant Health and Plant Products Regulations 1996*, grapes for table use (i.e. table grapes) are permitted entry into Victoria provided they are packed for sale as table grapes in accordance with these Regulations.

3.3.2.7 Western Australia

The importation of table grapes, seed, and plants into Western Australia from any source is prohibited under the *Plant Diseases Regulations 1989*, due essentially to the historical absence of downy mildew (*Plasmopara viticola*) and phylloxera. Downy mildew is now known to be present in Western Australia.

3.4 The Table Grape Industry in Australia

Approximately 80% of Australia's table grape production occurs in Victoria (60%) and New South Wales (20%). Table grape production was approximately 86,500 tonnes in 2002/03 and total value of table grape production for 2001/02 was $171.7 million.

[Source: Australian Table Grapes Association – Table Grape Annual Industry Report 2003]

The production season is from October-March with the heaviest production in January-March. Common varieties are Thompson Seedless (mid to late January-mid March), Flame Seedless (January), Menindee Seedless and Red Globe.

[Source http://www.dpi.qld.gov.au/hortport/2788.html ; http://www.qfvg.org.au/industry/fruit_vege/grapes.html]

3.5 The Table Grape Industry in Chile

Chile is the largest producer and exporter of table grapes in the southern hemisphere, and in the world is second largest to Italy. Grape production in Chile stretches from Region III to Region VII, with table grape growing principally concentrated in the central regions–

Regions V, Region VI, and the Metropolitan Region (Figure 1). These three regions cover about 28,845 hectares, 65% of the total table grape production area.

Figure 1. Chilean table grape growing regions

Approximately 50% of production is consumed domestically and 50% exported. During the 2000/01 season 557,570 tonnes of table grapes were exported from Chile with 59% to the USA and Canada, 16% to Europe, 15% to the Middle East, 9% to Latin America and 1% to the Far East.

Chile produces more than 35 varieties of table grapes for export. Most are seedless varieties such as Thompson Seedless and Flame Seedless with exports of these two varieties and Ribier accounting for 90% of total table grape exports from Chile.

Chilean table grapes are generally available from the third week of November to the last week of April. The grape producing regions in Chile all have a winter rainfall but varying climates ranging from a desert climate in Region III (1-100 mm average rainfall per year) to a warm humid temperate climate in Region VII (1000-1100 mm average rainfall per year).

Production of the early season varieties such as Perlette, Sugarone, and Flame Seedless in November starts in the centre-north valleys of Copiapo (Region III) and ends in April in the centre-south valleys of Curico and Talca (Region VII), with varieties such as Red Globe, Ribier, Crimson Seedless, Red Seedless, and Emperor [Source: Chilean Fresh Fruit Association, www.cffa.org].

A general description of the process used for the export of grapes from Chile based on information provided by SAG is given below.

The grapes are manually harvested and cleaned (e.g. removing defective berries) in the field and placed in plastic boxes. The boxes are then transferred to central packing plants where they are treated with sulphur dioxide (SO_2) to prevent post-harvest fungal diseases. The grapes are then classified according to quality and a second check for defects conducted. The packing and labelling process is then conducted according to the requirements of the export destination. All packaging is new, “sanitarily fit” and of homogenous presentation. Each package is identified by the exporter, species, variety, packing data, producer and net weight. Prior to palletising, a further quality control check is conducted to verify compliance with the quality standards of the product and the packing standards of the individual company. Each pallet has a label or tab where the number of boxes, variety and classification by size and colour are identified. Palletised fruit is then quickly cooled to 2-4ºC (depending on market requirements) then maintained at 0ºC until delivered to the port.

4 RESULTS OF PEST RISK ASSESSMENTS

4.1 Pest Categorisation

The quarantine pests for table grapes from Chile have been determined through a comparison of the pests recorded on table grapes in Chile and Australia (present or absent, present but with restricted/limited distribution and under official control [Appendix 1A], presence on the pathway under consideration [Appendix 1B], and potential for establishment or spread and associated consequences [Appendix 1C]). Pests that do not meet the definition of a quarantine pest are not considered further in the PRA. Appendix 2 contains this information for the pest plants.

Of the 314 pests recorded on table grapes in Chile, many occur in Australia or are not present on the import pathway and were therefore not considered further in this IRA. A number of pests are present in Australia but absent from Western Australia (based on advice provided to Biosecurity Australia by the Western Australia Department of Agriculture) and these pests are considered further in this IRA. A summary of this analysis is given in Tables 6 and 7.

Table 6: Summary of potential pests of table grapes in Chile and their occurrence in Australia

Pest type	Potentially associated with table grapes in Chile	Australian status		Consider further
		Present*	Absent	
Arthropods	86	44 (13)	42	55
Gastropods	1	1	0	0
Bacteria	3	3	0	0
Fungi	34	31 (1)	3	4
Nematodes	15	15 (1)	0	1
Phytoplasma	1	0	1	1
Viruses	10	9 (3)	1	4
Pest Plants	164	159 (33)	5	37
Total	**314**	**262 (51)**	**52**	**102**

* The number in brackets refers to species that are retained for further consideration due to being under official control, having restricted/limited distribution in Australia, not permitted or restricted entry into Australia by Commonwealth legislation, or uncertainty over presence of different strains in Australia.

Table 7: Number of pests of table grapes in Chile on the import pathway

Pest type	Number of species (from Table 6)	On pathway
Arthropods	55	26
Fungi	4	1
Nematodes	1	0
Phytoplasma	1	0
Viruses	4	0
Pest plants	37	12
Total	**102**	**39**

The 39 quarantine pests for table grapes from Chile, determined through this process of pest categorisation, are listed in Table 8. These pests require detailed risk assessment since they meet the IPPC criteria for a quarantine pest, specifically:

- the pest is known to be associated with table grapes in Chile;
- the pest is absent from Australia, or has a limited distribution and is under official control;
- the pest has the potential for being on the pathway;
- the pest has the potential for establishment or spread in the PRA area; and
- the pest has the potential for consequences.

Table 8: Quarantine pests for table grapes from Chile

Pest type	Common name
ARTHROPODS	
Acari (mites)	
Brevipalpus chilensis Baker [Acari: Tenuipalpidae]	False red mite
Eotetranychus lewisi (McGregor) [Acari: Tetranychidae]	Lewis spider mite
Oligonychus mangiferus (Rahman and Sapra) [Acari: Tetranychidae]	Mango spider mite*
Oligonychus punicae (Hirst) [Acari: Tetranychidae]	Avocado brown mite*
Oligonychus vitis Zaher & Shehata [Acari: Tetranychidae]	Table grape red mite
Oligonychus yothersi McGregor [Acari: Tetranychidae]	Avocado red mite
Panonychus citri (McGregor) [Acari: Tetranychidae]	Citrus red mite*
Panonychus ulmi (Koch) [Acari: Tetranychidae]	European red mite*
Tetranychus desertorum Banks [Acari: Tetranychidae]	Tetranychid mite
Coleoptera (weevils)	
Geniocremnus chiliensis (Boheman) [Coleoptera: Curculionidae]	Tuberous pine weevil
Naupactus xanthographus (Germar) [Coleoptera: Curculionidae]	Fruit tree weevil
Diptera (flies)	
Ceratitis capitata (Wiedemann) [Diptera: Tephritidae]	Mediterranean fruit fly
Hemiptera (leafhoppers, mealybugs, psyllids, sharpshooters, scales)	
Icerya palmeri Riley-How [Hemiptera: Margarodidae]	Margarodes scale
Parthenolecanium corni (Bouché) [Hemiptera: Coccidae]	European fruit lecanium*
Pseudococcus calceolariae (Maskell) [Hemiptera: Pseudococcidae]	Citrophilus mealybug*
Pseudococcus maritimus (Ehrhorn) [Hemiptera: Pseudococcidae]	Grape mealybug
Lepidoptera (leafrollers, moths, butterflies)	
Accuminulia buscki Brown [Lepidoptera: Tortricidae]	Tortricid leafroller
Accuminulia longiphallus Brown [Lepidoptera: Tortricidae]	Tortricid leafroller
Chileulia stalactitis (Meyrick) [Lepidoptera: Tortricidae]	Grape berry moth
Proeulia auraria (Clarke) [Lepidoptera: Tortricidae]	Chilean fruit tree leafroller
Proeulia chrysopteris (Butler) [Lepidoptera: Tortricidae]	Fruit leafroller
Proeulia triquetra Obraztsov [Lepidoptera: Tortricidae]	Grape leafroller
Thysanoptera (thrips)	
Drepanothrips reuteri Uzel [Thysanoptera: Thripidae]	Grape thrips
Frankliniella australis Morgan [Thysanoptera: Thripidae]	Chilean flower thrips
Frankliniella occidentalis (Pergande) [Thysanoptera: Thripidae]	Western flower thrips

Pest type	Common name
CONTAMINATING PESTS	
Latrodectus mactans (Fabricius) [Araneae: Theridiidae]	Black widow spider
PATHOGENS	
Fungi	
Phomopsis viticola (Sacc.) Sacc. type 2	Phomopsis cane and leaf spot, black rot*
PEST PLANTS	
Carduus nutans L.	Nodding thistle
Cuscuta suaveolens Ser.	Fringed dodder
Eragrostis virescens Presl.	Mexican lovegrass
Euphorbia lathyrus L.	Caper spurge
Euphorbia peplus L.	Petty spurge
Galium aparine L.	Cleavers
Rumex conglomeratus Murr.	Clustered dock
Rumex crispus L.	Curled dock
Rumex longifolius DC.	Long leaved dock
Sonchus arvensis L.	Corn sowthistle
Sorghum halepense (L.) Pers.	Johnson grass
Taeniatherum caput-medusae Boiss	Medusa-head

* WA only – this species is a quarantine pest for the State of Western Australia due to its absence from this State.

4.2 Risk Assessments for Quarantine Pests

A detailed risk assessment is presented in this PRA for each of the quarantine pests identified through the process of pest categorisation. Each risk assessment involved the “assessment of the probability of entry, establishment or spread” and “assessment of consequences” as described in Section 2 - Method for Pest Risk Analysis. The unrestricted risk posed by each quarantine pest for table grapes from Chile was estimated by combining the likelihood for entry, of establishment and of spread with the estimate of associated potential consequences. The unrestricted risk estimates were then compared with Australia’s appropriate level of protection (ALOP) to determine which quarantine pests presented an unacceptable level of risk requiring the further consideration of risk mitigation options.

Likelihood estimates for entry, establishment or spread and estimates of associated potential consequences are supported by relevant biological information. Because of similarities in pest biology, and consequent similarities between the risk assessments for some of the pests, the descriptions below are based, where relevant, on groupings of the pests. Detailed information on the biology and economic importance of each quarantine pest or pest group is provided in the data sheets in Part B of this IRA (Appendix 3).

The risk assessment methodology for pest plants described in Part B of this document was used to determine the requirement for risk management measures for pest plants.

The risk assessments were conducted on the basis of the use of standard cultivation, harvesting and packing activities involved in the commercial production of table grapes in Chile; for example in-field hygiene and management of pests, cleaning and hygiene during packing, and commercial quality control activities.

4.2.1 Spider mites

Spider mites are common plant pests that have tiny mouthparts modified for piercing individual plant cells and removing the contents. This results in tiny yellow or white speckles on plant tissue. When many of these feeding spots occur near each other, the foliage takes on a yellow or bronzed cast. Once the foliage of a plant becomes bronzed, it often drops prematurely. Heavily infested plants may be discoloured, stunted or even killed. Web producing spider mites may coat the foliage with the fine silk, which collects dust and looks dirty.

The spider mites examined in this IRA are:

- *Eotetranychus lewisi* (McGregor) [Acari: Tetranychidae] – Lewis spider mite;
- **Oligonychus mangiferus* (Rahman & Sapra) [Acari: Tetranychidae] – Mango spider mite;
- **Oligonychus punicae* (Hirst) [Acari: Tetranychidae] – Avocado brown mite;
- *Oligonychus vitis* Zaher & Shehata [Acari: Tetranychidae] – Table grape red mite;
- *Oligonychus yothersi* McGregor [Acari: Tetranychidae] – Avocado red mite;
- **Panonychus citri* McGregor [Acari: Tetranychidae] – Citrus red mite;
- **Panonychus ulmi* (Koch) [Acari: Tetranychidae] – European red mite; and
- *Tetranychus desertorum* Banks [Acari: Tetranychidae] – Tetranychid mite.

* WA only – this species is a quarantine pest for the State of Western Australia due to its absence from this State.

4.2.1.1 Introduction and spread probability

Probability of importation

The likelihood that spider mites will arrive in the PRA area with the importation of table grapes from Chile: **Low**.

- These mites have been reported on table grapes in Chile (Klein Koch & Waterhouse, 2000; Bolland *et al*., 1998; Prado, 1991).
- These mites are found on the foliage of various host plants including grapes (Bolland *et al*., 1998) but are rarely found on the fruit (Jeppson *et al*., 1975).
- Tetranychid mites are known to move to other parts of the plant (such as fruit) when populations are high (Jeppson *et al*., 1975).
- *Oligonychus vitis* primarily feeds on foliage and lays eggs on the bases of buds or in scars in wood. Larvae are found on the upper and lower surfaces of leaves and shoots (Gonzalez, 1983).
- These species of mites are rarely intercepted on grapes currently imported from countries where the species are present.

Probability of distribution

The likelihood that spider mites will be distributed to the endangered area as a result of the processing, sale or disposal of table grapes from Chile: **Very low**.

- Adults or nymphs may remain on the surface of the fruit during distribution via wholesale or retail trade.
- The commodity may be distributed throughout the PRA area for retail sale. The intended use of the commodity is human consumption but waste material would be generated.

- The adults of spider mites 'balloon' in order to disperse when densities are high by crawling to a high point, rearing up on their hind legs and catching a wind current to balloon on a silken thread (Lawson *et al*., 1996). The reliance on this dispersal mechanism, as opposed to independent movement, limits the ability of these spider mites to move onto a suitable host from discarded table grapes.

Probability of entry (importation x distribution)

The likelihood that spider mites will enter the PRA area as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Very low**.

- The overall probability of entry is determined by combining the probabilities of importation and distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

The likelihood that spider mites will establish based on a comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **Moderate**.

- Spider mites have a wide host range (Bolland *et al*., 1998) and the hosts of these mites (e.g. *Vitis* spp., *Prunus* spp., *Pyrus* spp. and *Citrus* spp.) are widespread in the PRA area.
- These mites are present in Chile and similar environments occur in Australia.
- Some of these mites (*Oligonychus mangiferus*, *Oligonychus punicae*, *Panonychus citri* and *Panonychus ulmi*) are already established in some areas in Australia and are subject to quarantine restrictions. Similar environments occur in many parts of the PRA area that would be suitable for establishment of these mites.
- Spider mites generally reproduce sexually. However, it is not necessary for females to find a male, as unfertilised females will produce only male offspring that then mate and go on to start a colony.
- Most spider mites overwinter in the egg stage but the two-spotted spider mite overwinters as adult females resting in protected places (Shetlar, 2000).
- Spider mite species seem to be warm weather or cool weather active pests. The two-spotted and European red mites do best in dry, hot summer weather (Shetlar, 2000).
- Spider mites have a short generation time. Depending on the region, several generations may occur within one year (Jeppson *et al*., 1975).
- Existing control programs (IPM, application of petroleum spray oil) may control these mites.

Probability of spread

The likelihood that these spider mites will spread based on a comparative assessment of those factors in the area of origin and in the PRA area considered pertinent to the expansion of the geographical distribution of the pest: **Moderate**.

- Natural physical barriers may prevent these pests spreading to host plants unaided.
- Spider mites do not have wings, and are therefore limited in their ability to disperse. Mites travel short distances by crawling, but depend on wind for long-distance dispersal (Jeppson *et al*., 1975). Under hot, dry, windy conditions, infestations can spread very quickly.
- These spider mites are more likely to disperse in association with host material. Interstate quarantine controls are in-place on the movement of nursery stock.

- Dispersal of these mites within and between orchards, if in close proximity, is typical of Tetranychidae in that the species utilises strands of webbing to ‘balloon’ with the prevailing wind (Lawson *et al*., 1996).
- The relevance of natural enemies of these mites in the PRA area is not known.

Probability of entry, establishment and spread

The overall likelihood that spider mites will enter the PRA area as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within the PRA area: **Very low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of ‘rules’ for combining descriptive likelihoods (Table 3).

4.2.1.2 Consequences

Consideration of the direct and indirect consequences of spider mites: **Low**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C**— Spider mites are capable of causing direct harm to a wide range of hosts (Jeppson *et al*., 1975). This includes damage in the form of chlorosis, leaf drop and reduced yield. Spider mites are estimated to have consequences of minor significance at the regional level.
Any other aspects of the environment	**A**— There are no known direct consequences of these mites on the natural or urban environment but their introduction into a new environment may lead to competition for resources with native species.
Indirect consequences	
Eradication, control etc.	**B** — Additional programs to minimise the impact of these mites on host plants may be necessary. An appropriate miticide or biological control would be required if these pests reached high levels of infestation. These mites are not serious pest of table grapes and are primarily controlled by biocontrol agents. Existing control programs may be effective for some hosts but not all hosts.
Domestic trade	**C** — The presence of these mites in commercial production areas may result in interstate trade restrictions. Interstate measures are currently in place in Australia for several species.
International trade	**C** — The presence of these mites in commercial production areas for a wide range of commodities (e.g. *Vitis, Citrus* and *Prunus* species) may have a minor effect at the regional level due to any limitations to access to overseas markets where these pests are absent.
Environment	**A** — Additional pesticide applications or other control activities may be required to control these pests on susceptible crops but any impact on the environment is unlikely to be discernible.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the ‘Method for assessing consequences’ section for details on the method used for consequence assessment.

4.2.1.3 Unrestricted risk estimate

The unrestricted risk estimate for spider mites, determined by combining the overall ‘probability of entry, of establishment and of spread’ with the ‘consequences’ using the risk estimation matrix (Table 1): **Negligible**.

4.2.2 Chilean false red mite

Various species of false spider mites feed on a variety of ornamental, fruit, and vegetable crops. The family is considered to be cosmopolitan. Most species of tenuipalpids are not of economic importance, however, all are phytophagous, and the few species that have been identified as pests, have shown that these mites possess the potential to cause severe economic damage to agricultural crops, ornamentals and timber (Baker, 1949; Baker & Tuttle, 1987; Ochoa & Salas, 1989; Evans *et al*., 1993). The Chilean false red mite is native to Chile, has economic impact on Chilean fruit production and is subject to permanent control measures.

The false red mite examined in this import risk analysis is:

- *Brevipalpus chilensis* Baker [Acari: Tenuipalpidae] – Chilean false red mite.

4.2.2.1 Introduction and spread probability

Probability of importation

The likelihood that Chilean false red mite (CFRM) will arrive in Australia with the importation of table grapes from Chile: **High**.

- CFRM has been reported on table grapes in Chile (Klein Koch & Waterhouse, 2000).
- CFRM lay eggs on the shoots, on leaves or in unopened buds (Gonzalez, 1968, 1983, 1989).
- CFRM primarily feeds on the lower surface of the leaves (Jeppson *et al*., 1975; SAG/USDA, 2002). It is expected that mites will be found on stems, during their transit from leaf to leaf.
- At high levels, CFRM kills buds as a result of tissue dehydration and causes wrinkling of the grapes (Gonzalez, 1968, 1983, 1989; Jeppson *et al*., 1975).
- CFRM is known to be associated with table grapes and has been intercepted on table grape from Chile to the USA (SAG/USDA, 2002).

Probability of distribution

The likelihood that CFRM will be distributed to the endangered area as a result of the processing, sale or disposal of table grapes from Chile: **Low**.

- Adults or immature stages may not be detected within grape bunches and may be distributed via wholesale or retail trade.
- The commodity may be distributed throughout Australia for retail sale, as the intended use of the commodity is human consumption. Waste material would be generated.
- Transfer of CFRM from the fruit pathway to a suitable host is a significant limiting factor in its distribution. False spider mites are mainly sedentary (Kane, 2004) and slow moving (Jeppson *et al*., 1975).

Probability of entry (importation x distribution)

The likelihood that CFRM will enter Australia as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Low**.

- The overall probability of entry is determined by combining the probabilities of importation and distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

The likelihood that CFRM will establish based on a comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **High**.

- CFRM has multiple hosts including almond, apple, citrus, cherimoya, fig, kiwifruit, persimmon, quince and table grapes (Gonzalez, 1968, 1975, 1989; Jeppson *et al*., 1975; Ripa & Rodriguez, 1999). It also attacks species of forest trees, ornamentals and annual weeds (Jeppson *et al*., 1975). Many of these hosts are widespread in Australia.
- CFRM overwinters in vines as groups of fertilised adult females under the vine bark where they hide in grooves and hollows (Gonzalez, 1968, 1983, 1989).
- Females lay 130 to 140 eggs during their average 30-day lifespan. After 10 or 12 days, nymphs hatch from the eggs, go through three stages and reach adulthood in 30 to 40 days. CFRM is multivoltine, with four to five generations per year (Gonzalez, 1968).
- Tenuipalpid mites appear to be best adapted to subtropical or tropical regions (Baker & Bambara, 1997). Some species of *Brevipalpus*, namely *B. californicus*, *B. lewisi*, *B. obovatus* and *B. phoenicis*, are already established in Australia (Smith *et al*., 1997). The establishment of these species in Australia indicates that environmental conditions would be suitable for establishment of CFRM in Australia.
- Presence of abundant host plants and a warm and humid climate would favour the development of high population densities of this mite in Australia.
- Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not for all hosts. However, pesticide resistance has been noted for CFRM.

Probability of spread

The likelihood that CFRM will spread based on a comparative assessment of those factors in the area of origin and in Australia considered pertinent to the expansion of the geographical distribution of the pest: **Moderate**.

- Natural physical barriers may prevent CFRM spreading unaided but adults and immature forms may spread undetected via the movement of fruit or infested vegetative host material.
- False spider mites have the potential to go undetected on plants due to their minute size, flat bodies and somewhat sedentary behaviour (Kane, 2004).
- The main means of long distance dissemination of CFRM is by the movement of plants and vegetative material (Gonzalez, 1983).
- Given the polyphagous nature of the CFRM, the occurrence of other host plants between commercial vineyards in Australia would aid the spread of this mite.
- Dispersal of CFRM is primarily by plant contact and mites may also be moved by human contact with infested plants.
- The relevance of natural enemies of CFRM in Australia is not known. Natural predators may be able to attack CFRM but there is no evidence that they would be effective.

Probability of entry, establishment and spread

The overall likelihood that CFRM will enter the PRA area as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within the PRA area: **Low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.2.2.2 Consequences

Consideration of the direct and indirect consequences of CFRM: **Moderate**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — Chilean false red mite is an important pest of various horticulture crops in Chile, and is capable of causing significant reductions in the production of marketable fruit. CFRM has been described as a very destructive pest of grapevines (Jeppson *et al*., 1975).
Any other aspects of the environment	**A** — There are no known direct consequences of the mite on the natural or urban environment but its introduction into a new environment may lead to competition for resources with native species.
Indirect consequences	
Eradication, control etc.	**C** — Additional programs to minimise the impact of these mites on host plants may be necessary. Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not all hosts (e.g. where specific integrated pest management programs are used).
Domestic trade	**C** — The presence of CFRM in commercial production areas may have a significant effect due to any resulting interstate trade restrictions on a wide range of commodities.
International trade	**D** — The presence of CFRM in the commercial production areas of a range of commodities (apple, citrus and grape) may have a significant effect at the regional level due to any limitations to access to overseas markets where this pest is absent. These restrictions may lead to a loss of markets, which in turn would be likely to require industry adjustment. Various countries that import host commodities from Chile apply phytosanitary restrictions for this pest. Korea, South Africa and USA list CFRM as a pest of concern.
Environment	**A** — Pesticides required to control CFRM are estimated to have consequences that are unlikely to be discernible at the regional level and of minor significance at the local level.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.2.2.3 Unrestricted risk estimate

The unrestricted risk estimate for CFRM, determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 1): **Low**.

4.3.3 Weevils

Weevils are characterised by having an elongated, downwards curving snout. Many weevils are serious pests of crops, seeds and plants. They vary in size from small seed weevils, less than 2 mm long, to the large pine weevils, 20-25 mm long. The larval stages are relatively featureless white or yellowish grubs, usually legless, but with a well-developed head and jaws. Adults and larvae of all species feed either on living or dead plant tissues. The larvae of many species feed inside the roots, stems or seeds of plants, and some of these species can become serious pests of agricultural crops, garden plants and stored food products (Lawrence & Britton, 1991).

The weevils examined in this import risk analysis are:

- *Geniocremnus chiliensis* (Boheman) [Coleoptera: Curculionidae] – Tuberous pine weevil; and
- *Naupactus xanthographus* (Germar) [Coleoptera: Curculionidae] – South American fruit tree weevil.

The listed weevil species are recognised as significant pests of table grapes in Chile. Due to the recognised importance of the South American fruit tree weevil (SAFTW), it was used as the basis for the risk assessment.

4.3.3.1 Introduction and spread potential

Probability of importation

The likelihood that weevils will arrive in Australia with the importation of table grapes from Chile**: High**.

- These weevils have been reported on table grapes in Chile (Gonzalez, 1980).
- SAFTW lays eggs under the bark in several clusters. In Chile, SAFTW lay eggs in late summer and autumn (Caballero, 1972), from January to the end of March or the beginning of April (Gonzalez, 1980). On hatching, the larvae mainly feed on leaf rolls but will also feed on the buds, flowers and fruitlets of the host plant. Adult females are 14-18mm and males are 12-14mm (Gonzalez, 1983).
- The primary symptom is wilting of the foliage due to larval feeding. Adult feeding is noticeable only as superficial damage to leaves and fruits.
- Weevils hide during the day and move about the plants at nightfall (Lyon, 2000), biting deeply into the buds and the leaves, lacerating the vine canes.
- The peaks of adult emergence for SAFTW are in September-October and December-February (Gonzalez, 1983). This overlaps with the main season for table grapes in Chile (late November-late April, i.e. late spring-mid autumn).
- Adults of these weevils may be concealed within bunches of table grapes and have been intercepted on the table grapes from Chile in the US and Peru (Gonzalez, 1983).

Probability of distribution

The likelihood that weevils will be distributed as a result of the processing, sale or disposal of table grapes from Chile, to the endangered area: **Low**.

- Adults present within grape bunches may not be detected and may spread via wholesale or retail trade (as demonstrated by interceptions of SAFTW during phytosanitary inspections).
- The commodity may be distributed throughout Australia for retail sale, as the intended use of the commodity is human consumption. Waste material would be generated.
- SAFTW females are capable of producing offspring in the absence of males for up to 6 months (Gonzalez, 1983).
- The larvae of SAFTW are positively geotropic and enter the soil (Gonzalez, 1980), where they live at depths of 30-120 cm, depending on soil texture (Gonzalez, 1980; Ripa, 1986a). The larval stage has five instars and lasts 11-14 months, or longer, but never more than 20 months (Gonzalez, 1980).
- Adults are flightless (Ripa, 1984, 1985); therefore, the movement of SAFTW from grape bunches would be limited.

Probability of entry (importation x distribution)

The likelihood that weevils will enter the PRA area as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Low**.

- The overall probability of entry is determined by combining the probabilities of importation and of distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

Comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **High**.

- SAFTW has a wide host range including apple, avocado, citrus, custard apple, loquat, kiwifruit, olive, stone fruits and walnuts (Gonzalez, 1983; Ripa, 1986b) and these hosts are widely distributed in Australia.
- Some species of *Naupactus*, namely *Naupactus leucoloma*, is already established in Australia (APPD, 2004). Establishment of this weevil indicates that environmental conditions would be suitable for establishment of SAFTW in Australia.
- SAFTW is native to the southern part of South America (Gonzalez, 1980) and has been introduced into Chile (Wibmer & O'Brien, 1986), where it is now widespread and common in the central zone (Caballero, 1972; Gonzalez, 1980). It is also reported from Argentina (Bentancourt & Scatoni, 1992); Chile (Caballero, 1972); and Uruguay (Bentancourt & Scatoni, 1992). Similar environments occur in Australia.
- In Chile, eggs are laid in late summer and autumn (Caballero, 1972), from January to the end of March or the beginning of April (Gonzalez, 1980).
- Adult females lay eggs at night (Gonzalez, 1980) on the trunk of the host plant just below the branches (Gonzalez, 1980; Ripa, 1984), on or under the bark, or under plastic sleeves (Gonzalez, 1980). Eggs are laid in groups (Ripa, 1984), consisting of 25-45 eggs (Gonzalez, 1980) with up to 25 locations per plant (Gonzalez, 1983).
- SAFTW females are capable of producing offspring in the absence of males for up to 6 months with each female able to produce up to 1000 eggs (Gonzalez, 1983).
- The larvae are positively geotropic and enter the soil (Gonzalez, 1980), where they live at depths of 30-120 cm, depending on soil texture (Gonzalez, 1980; Ripa, 1986a). The larval stage has five instars and lasts 11-14 months, or longer, but never more than 20 months (Gonzalez, 1980). The larvae feed on the rootlets of the plants, or tunnel in older roots (Caballero, 1972).
- A generation can be completed in 19-20 months (Caballero, 1972).
- Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not for all hosts.

Probability of spread

Comparative assessment of those factors in the area of origin and in the PRA area considered pertinent to the expansion of the geographical distribution of the pest: **Moderate**.

- The fruit crop hosts of the SAFTW are located in many parts of Australia. Natural barriers, such as arid areas, climatic differentials and long distances, exist between these areas. The long distances between commercial host crops in Australia would make it difficult for the SAFTW to disperse by natural spread.
- These pests may be spread as adults via infested host commodities or as larvae in soil or on products/machinery that are carrying soil.

- SAFTW has limited natural dispersal mechanisms as adults cannot fly (Ripa, 1984, 1985). Adults can climb the trunks of host plants (Ripa, 1984, 1985), and when disturbed they drop to the ground (Ripa, 1987). The legless first-instar larvae are also able to climb (Loiácono & Díaz, 1992).
- Weevils are subject to attack by an array of predators and parasitoids. Various Hymenoptera (i.e. Mymaridae, Pteromalidae) attack eggs, and spiders and wasps prey upon larvae (Lawrence & Britton, 1991). *Fidiobia asina* has been reported attacking the eggs in Chile.
- The relevance of natural enemies in Australia is not known.
- Similar environments (e.g. temperature, rainfall) occur both in Chile and Australia.

Probability of entry, establishment or spread

The overall likelihood that weevils will enter the PRA area as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within Australia: **Low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.3.3.2 Consequences

Consideration of the direct and indirect consequences of weevils: **Moderate**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — SAFTW attacks deciduous fruit trees (especially peach), vines and many other plants and requires active management during the growing season. The larvae feed on the leaves, rootlets of the plants or tunnel in older roots; when infestation is heavy, the plants are killed. The adults feed on the leaves, but cause less damage than the larvae (Caballero, 1972). It is not known to be very damaging in Uruguay (Bentancourt & Scatoni, 1992). In Chile, however, it is an introduced insect (Wibmer & O'Brien, 1986), and is considered one of the more important pests of grape (Gonzalez, 1983; Bentancourt & Scatoni, 1992).
Any other aspects of the environment	**A** — There are no known direct consequences of these pests on the natural environment, but their introduction into a new environment may lead to competition for resources with native species.
Indirect consequences	
Eradication, control etc.	**D** — Programs to minimise the impact of SAFTW on host plants are likely to be costly and include pesticide applications and crop monitoring. A control program would have to be implemented in infested orchards to reduce fruit damage and yield loss, thereby increasing production costs. Eradication and control would be significant at the regional level. SAFTW may potentially increase production costs by triggering specific controls as this pest is of quarantine concern to important trading partners.
Domestic trade	**C** — The presence of these pests in commercial production areas may have a significant effect at the local level due to any resulting interstate trade restrictions on a wide range of commodities. These restrictions may lead to a loss of markets.
International trade	**D** — The presence of SAFTW in the commercial production areas of a range of commodities (apple, citrus, grapes and stone fruits) may have a significant effect at the regional level due to any limitations to access to overseas markets where this pest is absent. These restrictions may lead to a loss of markets, which in turn would be likely to require industry adjustment. Various countries that import

Criterion	Estimate
	host commodities from Chile apply phytosanitary restrictions for this pest.
Environment	**A** — Although additional pesticide applications or other control activities would be required to control these pests on susceptible crops, any impact on the environment is unlikely to be discernible.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.3.3.3 Unrestricted risk estimate

The unrestricted risk estimate determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 1): **Low**.

4.3.4 Mediterranean fruit fly

The fruit fly examined in this import risk analysis is:

- *Ceratitis capitata* (Wiedemann) [Diptera: Tephritidae] – Medfly.

Mediterranean fruit fly (*Ceratitis capitata;* medfly) is not considered a pest of table grapes in Chile. However, Medfly has been detected within Chile previously and eradicated. It is presumed that sporadic outbreaks derive from fresh produce imported from areas where the pest occurs. Biosecurity Australia considers there may be a risk of medfly infesting export fruit and escaping detection for a short period of time.

4.3.4.1 Introduction and spread potential

Probability of importation

The likelihood that Medfly will arrive in the PRA area with the importation of table grapes from Chile**: Low**.

- Biosecurity Australia currently recognises that Chile is free of Medfly. However, should this species become established in Chile, eggs laid by mature females may be present under the skin of host fruit. Larvae of this species are internal feeders and may not be readily detected during visual inspections.

Probability of distribution

The likelihood that Medfly will be distributed as a result of the processing, sale or disposal of table grapes from Chile, to the endangered area: **Moderate**.

- Should this species become established in Chile, imported fruit with internal infestation may be distributed throughout Australia via wholesale or retail trade.
- The commodity may be distributed throughout Australia for retail sale, as the intended use of the commodity is human consumption. Waste material would be generated.
- Medfly larvae may survive shipment because of their ability to tolerate cold storage temperatures (Thomas *et al*., 2001).

Probability of entry (importation x **distribution)**

The likelihood that Medfly will enter the PRA area as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Low**.

- The overall probability of entry is determined by combining the probabilities of importation and of distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

Comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **High**.

- Medfly is polyphagous, feeding on the fruits of many plants such as citrus, peach, pear, apple, apricot, fig, plum, kiwi fruit, quince, grape, sweet cherry, pomegranate and strawberry. Its host relationships vary from region to region depending on what fruits are available (White & Elson-Harris, 1994).
- Hosts are widely distributed throughout Australia, both in commercial orchard districts and suburban areas.
- Mediterranean type climates that favour the establishment of Medfly occur in various parts of Australia.
- Medfly is already established in areas of Western Australia. The largest populations occur in the Perth metropolitan area and in towns in the south west of the State (Woods, 1997).
- Development of Medfly is principally dependent on temperature. The optimum temperature is around 32ºC, which enables completion of a generation within 2 weeks. There are 4-5 generations per year, with the number of generations determined by temperature (Fletcher, 1989). In tropical and subtropical regions there may be as many as 12-13 generations per year. In southern Italy, 6 to 7 generations per year have been reported (HYPP, 2004).
- Females lay eggs in clusters of 3 to 7, about 2 to 5 mm deep inside the fruit. Under optimum conditions, the female may lay 500 to 600 eggs during her life (HYPP, 2004). Multiple oviposition by different females can result in many larvae occurring in the same fruit (Thomas *et al*., 2001). During warm weather, eggs hatch in 1.5 – 3 days. Larvae feed and develop within the fruit until ready to pupate in the soil (Thomas *et al*., 2001).
- Females will not lay eggs when temperatures drop below 16ºC except when exposed to sunlight for several days. Development of the egg, larval and pupal stages stop at 10ºC (Thomas *et al*., 2001).
- Medfly can survive the winter in both adult and immature stages (De Lima, 1998). Pupae carry the species through unfavourable conditions. In Australia, adults overwinter in citrus trees (Smith *et al*., 1997).

Probability of spread

Comparative assessment of those factors in the area of origin and in the PRA area considered pertinent to the expansion of the geographical distribution of the pest: **Moderate**.

- Medfly has a wide host range (Thomas *et al*., 2001) and is tolerant to a range of environmental conditions. Without appropriate controls, this species may spread within Australia.
- Medfly is under official control in Australia to prevent its spread from Western Australia into other States (De Lima *et al*., 1993).
- There are restrictions in place in Australia on the movement of fruit to prevent the spread of fruit flies, including Medfly.
- Established detection (including a national fruit fly trap surveillance network), containment and eradication procedures in place in Australia for Medfly have been used previously to control its spread when outbreaks occur (Meats *et al*., 2003).

Probability of entry, establishment or spread

The overall likelihood that Medfly will enter the PRA area as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within Australia: **Low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.3.4.2 Consequences

Consideration of the direct and indirect consequences of Medfly: **High**.

Criterion	Estimate
Direct consequences	
Plant life or health	**D** — Medfly is polyphagous and the most serious fruit fly pest in the Mediterranean environment (Christenson & Foote, 1960). It is capable of causing significant reductions in the production of marketable fruit.
Any other aspects of the environment	**B** — Fruit flies introduced into a new environment will compete for resources with the native species. There may be significant consequences of these pests for native plants at a local level, which would be unlikely to be discernible at a national level.
Indirect consequences	
Eradication, control etc.	**E** — Programs to control/eradicate this pest from areas in Australia would be costly. For example, the cost of eradication of Medfly is estimated at AU$70m for Western Australia and US$20m for Florida. In 1995, the papaya fruit fly eradication program, using male annihilation and protein bait sprays, cost AU$ 34 million (QDPI, 2003). The potential economic risk associated with Medfly is considerable, with an endemic infestation in California estimated to cost in excess US$ 1 billion per annum (Siebert, 1994). Over US$ 350 million has already been spent to prevent Medfly becoming established in California (Metcalf, 1995). Increases in the existing monitoring programs would also be costly.
Domestic trade	**D** — The presence of fruit flies in commercial production areas has a significant effect at the regional level due to interstate trade restrictions on a wide range of commodities.
International trade	**D** — The major risk for Australia arises from the imposition of much stricter phytosanitary restrictions on fruit exports should Medfly become established, even temporarily, in areas currently free of this pest. When the papaya fruit fly outbreak occurred in northern Queensland, Australia experienced trade effects that affected the whole country.
Environment	**A** — Although additional pesticide applications or other control activities would be required to control these pests on susceptible crops, any impact on the environment is unlikely to be discernible.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.3.4.3 Unrestricted risk estimate

The unrestricted risk estimate for Medfly, determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 1): **Moderate**.

4.3.5 Mealybugs

Mealybugs injure plants by extracting relatively large quantities of sap and producing honeydew that serves as a substrate for the development of sooty moulds. They generally prefer warm, humid, sheltered sites away from adverse environmental conditions and natural enemies. Many mealybug species pose particularly serious problems to agriculture when introduced into new areas of the world without their specific natural enemies.

The mealybugs examined in this import risk analysis are:

- **Pseudococcus calceolariae* Maskell [Hemiptera: Pseudococcidae] – Citrophilus mealybug; and
- *Pseudococcus maritimus* (Ehrhorn) [Hemiptera: Pseudococcidae] – Grape mealybug.

* WA only – this species is a quarantine pest for the State of Western Australia due to its absence from this State.

4.3.5.1 Introduction and spread probability

Probability of importation

The likelihood that mealybugs will arrive in the PRA area with the importation of table grapes from Chile: **High**.

- These mealybugs have been reported on table grapes in Chile (Prado, 1991).
- Mealybugs are small and often inconspicuous but may be present on table grapes.
- Mealybugs are known to be associated with table grapes. For example, mealybugs have been intercepted on Chilean table grapes imported into New Zealand (NZ MAF, 2002a) and *Pseudococcus maritimus* has been intercepted during pre-export inspection of Californian table grapes destined for Australia.

Probability of distribution

The likelihood that mealybugs will be distributed to the endangered area as a result of the processing, sale or disposal of table grapes from Chile: **Moderate**.

- The commodity may be distributed throughout the PRA area for retail sale. The intended use of the commodity is human consumption but waste material would be generated (e.g. vegetative parts of the cluster and discarded berries).
- Mealybugs are likely to survive storage and transportation. *Pseudococcus affinis* can survive up to 42 days storage at 0ºC (Hoy & Whiting, 1997).
- These pests may enter the environment as adults discarded with fruit or as juveniles blown by wind or carried by other vectors. Long-range dispersal would require movement of adults and nymphs with vegetative material. Mealybugs are mobile at all life stages. First instar nymphs are highly mobile while adults only move slowly.
- Short-range dispersal of juveniles could occur through the movement of crawlers, in wind currents, or as contaminants on biological or mechanical vectors (Williams, 1996). The long-range dispersal of mealybugs requires the movement of adults and nymphs with vegetative material.
- Because all stages of mealybugs survive in the environment for some time and because they are polyphagous, they could be transferred to a susceptible host.

Probability of entry (importation x distribution)

The likelihood that mealybugs will enter the PRA area as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Moderate**.

- The overall probability of entry is determined by combining the probabilities of importation and distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

The likelihood that mealybugs will establish based on a comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **High**.

- Grape mealybug is known to damage apple, damson, peach, European pear and grapevine. Citrophilus mealybug is a highly polyphagous species that has been recorded on 40 plant families (Ben-Dov, 1994) and these hosts are widespread in the PRA area.
- Mealybug development is temperature dependent. There is a minimum threshold temperature for each species of mealybug, below which development either ceases totally or is slowed significantly. There is also a maximum threshold temperature, above which development is slowed significantly or ceases all together. If temperatures remain elevated for prolonged periods, insect mortality increases significantly.
- Mild to warm conditions are most favourable with temperatures of about 25°C and a high relative humidity being optimum for mealybug development. In Australia, mealybug populations peak in spring and autumn.
- These pests have high fecundity rates. Females of grape mealybug produce an average of 110 eggs in a lifetime. Mature females of citrophilus mealybug lay approximately 500 eggs and these hatch within a few days. Females cease feeding before egg laying and die at the end of egg laying.
- Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not all hosts (e.g. *Malus* and *Pyrus* where specific integrated pest management programs are used).
- Several species of *Pseudococcus* are reported in Australia, demonstrating the suitability of climatic conditions in Australia for their survival.

Probability of spread

The likelihood that mealybugs will spread based on a comparative assessment of those factors in the area of origin and in the PRA area considered pertinent to the expansion of the geographical distribution of the pest: **High**.

- Movement of commodities would help the dispersal of these mealybugs. Adults and immature forms may spread undetected via the movement of fruit or infested vegetative host material.
- Short-range dispersal of juveniles could occur through the movement of crawlers, in wind currents or as contaminants on biological or mechanical vectors (Williams, 1996).

- Adult males are winged, capable of short flights and are short lived. Male dispersal by crawling or flight is strongly affected by the location of females and their production of sex pheromones.
- Natural enemies of the citrophilus mealybug, such as *Cryptolaemus montrouzieri* and the parasitoids *Tetracnemus pretisous* and *Coccophagus gurneyi*, are used to control this pest in Australia and other countries.
- Similar environments (e.g. temperature, rainfall) occur in Chile and Australia.

Probability of entry, establishment and spread

The overall likelihood that mealybugs will enter Australia as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within Australia: **Moderate**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.3.5.2 Consequences

Consideration of the direct and indirect consequences of mealybugs: **Low**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — Mealybugs can cause direct harm to a wide range of plant hosts and have also been reported as disease vectors (Ben-Dove, 1994). Fruit quality can be reduced by the presence of sooty mould.
Any other aspects of the environment	**A** — There are no known direct consequences of citrophilus mealybug on the natural or built environment but its introduction into a new environment may lead to competition for resources with native species.
Indirect consequences	
Eradication, control etc.	**C** — Additional programs to minimise the impact of these pests on host plants may be necessary. Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not all hosts (e.g. where specific integrated pest management programs are used).
Domestic trade	**C** — The presence of these pests in commercial production areas may have a significant effect due to any resulting interstate trade restrictions on a wide range of commodities.
International trade	**C** — The presence of these pests in commercial production areas of a range of commodities (e.g. *Vitis* and *Citrus* spp.) may have a significant effect at the district level due to any limitations to access to overseas markets where these pests are absent.
Environment	**A** — Although additional pesticide applications or other control activities would be required to control these pests on susceptible crops, any impact on the environment is unlikely to be discernible.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.3.5.3 Unrestricted risk estimate

The unrestricted risk estimate for mealybugs, determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 1): **Low**.

4.3.6 Scales

Scale insects are sessile, small and often inconspicuous and have been spread widely on plants and plant products. The reproductive rates for soft scales are weather dependent and more generations are produced in tropical climates. Maritime locations are also favourable because of their moderate climates. A wax-based covering protects armoured scales. The main economic damage caused by soft scale is from the downgrading of fruit quality caused by sooty mould fungi growing on the honeydew produced by these scales.

The scales examined in this extension of existing policy are:

- *Icerya palmeri* Riley-How [Hemiptera: Margarodidae] – Margarodes scale; and
- **Parthenolecanium corni* (Bouché) [Hemiptera: Coccidae] – European fruit lecanium.

* WA only – this species is a quarantine pest for the State of Western Australia due to its absence from this State.

The listed scales species are recognised as significant pests of table grapes in Chile. Due to the recognised importance of the European fruit lecanium (EFL), it was used as the basis for the risk assessment.

4.3.6.1 Introduction and spread probability

Probability of importation

The likelihood that scales will arrive in the PRA area with the importation of table grapes from Chile: **High**.

- These scales have been reported on table grapes in Chile (Klein Koch & Waterhouse, 2000; Prado, 1991).
- EFL females lay several eggs underneath their brown leathery shell (Battany, 2003). The females then die leaving the eggs well protected underneath the remaining shells.
- The first instars of EFL infest the foliage, usually on the undersides of the leaves, whereas later stages occur on the stems and branches.
- Scales have been intercepted on table grapes imported from Chile into New Zealand (NZ MAF, 2002a).

Probability of distribution

The likelihood that scales will be distributed to the endangered area as a result of the processing, sale or disposal of table grapes from Chile: **Low**.

- Adults or immature forms may remain on the surface of the fruit during distribution via wholesale or retail trade.
- Adults or immature forms are likely to survive storage and transport and be associated with infested waste.
- The commodity may be distributed throughout Australia for retail sale, as the intended use of the commodity is human consumption. Waste material would be generated.
- The natural dispersal mechanism that allows for the movement of scale species from discarded fruit waste to a suitable host is a significant limiting factor. Scales have a limited ability to disperse independently.

Probability of entry (importation x distribution)

The likelihood that scales will enter the PRA area as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Low**.

- The overall probability of entry is determined by combining the probabilities of importation and distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

The likelihood that scales will establish based on a comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **High**.

- EFL is highly polyphagous, attacking some 350 plant species placed in 40 families (Ben-Dov, 1993). It attacks a wide range of crops, mostly woody fruit trees and ornamentals.
- A range of plants commonly found in the PRA area can act as hosts for these species, including *Prunus armeniaca* (apricot), *Prunus avium* (sweet cherry) and *Vitis vinifera* (grapevine).
- Although the precise climate tolerance of scales is unknown, they are considered to be tropical or subtropical pests, and are therefore less likely to establish in either cool or hot and dry climates.
- EFL reproduces sexually and parthenogenetically and has between one and three generations a year. It exhibits great heterogeneity between populations in sex ratio and number of generations (Danzig, 1995). One generation per year has been reported in New Zealand (Henderson, 2001) and California (Battany, 2003).
- EFL overwinters as immature females on twigs (Henderson, 2001). The new generation is produced through summer and the young tend to settle on the leaves before moving to the stems.
- EFL is already established in New South Wales, Tasmania and Victoria, indicating that suitable environments for its establishment are available in the PRA area.
- Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not necessarily all hosts.

Probability of spread

The likelihood that scales will spread based on a comparative assessment of those factors in the area of origin and in the PRA area considered pertinent to the expansion of the geographical distribution of the pest: **Moderate**.

- EFL is already recorded in Australia (AICN, 2004) but is absent from Western Australia. There are similar environments in Western Australia that would be suitable for its spread.
- Dispersal is by the first-instar crawler, aided by wind and animals, and by human transport of infested material. Apart from the winged male, the other stages are mostly sedentary (Danzig, 1995).
- Similar environments (e.g. temperature, rainfall) occur in Chile and Australia.
- Several natural enemies that attack scales occur in Australia.

Probability of entry, establishment and spread

The overall likelihood that scales will enter the PRA area as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within the PRA area: **Low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, establishment and spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.3.6.2 Consequences

Consideration of the direct and indirect consequences of scales: **Low**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — Scales can cause direct harm to a wide range of plant hosts (Gill, 1988). In Europe, EFL is a pest of a range of fruit and nut trees and ornamentals. It seriously infests hazel trees in Greece (Santas, 1985). Infestations result in reduced vigour and general debility of the host plant. In addition to the direct feeding damage, the honeydew excreted forms a substrate for the growth of black sooty moulds, fouling fruit and impairing photosynthesis, sometimes causing premature leaf drop. Sooty mould fouling reduces the value and marketability of produce and ornamentals.
Any other aspects of the environment	**A** — Scales introduced into a new environment will compete for resources with the native species. They are estimated to have consequences, which are unlikely to be discernible at the national level and of minor significance at the local level.
Indirect consequences	
Eradication, control etc.	**C** — Additional programs to minimise the impact of these pests on host plants may be necessary. Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not all hosts (e.g. where specific integrated pest management programs are used).
Domestic trade	**B** — The presence of these pests in commercial production areas may have an effect due to any resulting interstate trade restrictions on a wide range of commodities.
International trade	**B** — The presence of these pests in commercial production areas of a range of commodities (e.g. *Vitis*, *Citrus*) may have an effect due to possible limitations to access to overseas markets where these pests are absent.
Environment	**A** — Although additional pesticide applications or other control activities would be required to control these pests on susceptible crops, any indirect effect on the environment is unlikely to be discernible.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.3.6.3 Unrestricted risk estimate

The unrestricted risk estimate for scales, determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 1): **Very low**.

4.3.7 Leafrollers

Leafrollers are larval (caterpillar) stages of a number of species of moth. Leafrollers are members of the Tortricidae family, which include 5,000 species throughout the world. Tortricid leaf roller larvae cause damage by chewing holes in fruit, resulting in scarring, desiccation and rotting of fruit. The genus *Proeulia* is native to Chile and includes 22 species from which three have been recorded on cultivated plants.

The leafrollers examined in this import risk analysis are:

- *Accuminulia buscki* Brown [Lepidoptera: Tortricidae] – Tortricid leafroller
- *Accuminulia longiphallus* Brown [Lepidoptera: Tortricidae] – Tortricid leafroller
- *Chileulia stalactitis* (Meyrick) [Lepidoptera: Tortricidae] – Grape berry moth
- *Proeulia auraria* (Clarke) [Lepidoptera: Tortricidae] – Chilean fruit tree leafroller

- *Proeulia chrysopteris* (Butler) [Lepidoptera: Tortricidae] – Fruit leafroller
- *Proeulia triquetra* Obraztsov [Lepidoptera: Tortricidae] – Grape leafroller

The listed leafroller species are recognised as significant pests of table grapes in Chile.

4.3.7.1 Introduction and spread potential

Probability of importation

The likelihood that leafrollers will arrive in Australia with the importation of table grapes from Chile**: Moderate**.

- These pests have been reported on table grapes in Chile (Brown, 1999; Gonzales, 1983).
- Larvae of *Accuminulia* feed on table grapes and stone fruits (Brown, 1999) while larvae of *Proeulia* and *Chileulia* feed on tree fruit, grapes and citrus (Gonzales, 1989).
- *Chileulia stalactitis* primarily feeds on foliage, mature fruit and developing fruit causing significant damage to stone fruits (Gonzalez, 1983).
- *Accuminulia*, *Chileulia* and *Proeulia* are capable of boring into the fruit of host plants (Brown, 1999). This study contradicts other studies that indicate that *Proeulia* species are external feeders (Pucat, 1994; Brown & Passoa, 1998).
- *Proeulia auraria* and *P. triquetra* are known to destroy buds, berries and vegetative material of *Vitis* in Chile and their presence is characterised by the presence of rolled up leaves (Gonzalez, 1983).
- *Accuminulia buscki* has been intercepted in the USA on Chilean table grapes (Brown, 1999).
- A range of lepidopterans has been intercepted during pre-shipment inspection of Californian table grapes destined for Australia.
- These pests may be associated with the table grape pathway but have not been intercepted on Chilean table grapes imported into New Zealand.

Probability of distribution

The likelihood that these pests will be distributed to the endangered area as a result of the processing, sale or disposal of table grapes from Chile: **Moderate**.

- Larvae can occur within fruit and/or within bunches and may therefore remain with the commodity during distribution via wholesale or retail sale.
- Adults and immature forms may also hide within bunches and remain with the commodity during distribution via wholesale or retail trade.
- The commodity may be distributed throughout Australia for retail sale, as the intended use of the commodity is human consumption. Waste material would be generated.
- If adult moths were to survive cold storage, they could enter the environment by flight from fruit at the point of sale, during transportation of purchased fruit from retailers to households and from discarded fruit waste at landfills.
- The natural dispersal stage for these pests is the adult.
- Early instar larvae that have escaped detection during inspection would be unlikely to develop in discarded fruit before the fruit desiccates or decays.
- The larvae would also be unlikely to find a suitable host on which to complete their development.

Probability of entry (importation x distribution)

The likelihood that leafrollers will enter Australia as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Low**.

- The overall probability of entry is determined by combining the probabilities of importation and of distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

Comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **High**.

- These pests have wide host ranges that include apple, citrus, kiwifruit, grapes and stone fruits (Gonzalez, 1983; Artigas, 1994; Brown, 1999). Many of these hosts are widely distributed in Australia.
- Some species can overwinter as first instar larvae protected by webs, in hollow or dried fruit of hosts, or continue to develop on evergreen hosts (Pucat, 1994).
- Egg masses are laid on the foliage of the host plants. Larvae primarily feed on the foliage and are also reported as external fruit feeders (Pucat, 1994; Brown & Passoa, 1998) or internal fruit feeders (Brown, 1999).
- Adult *Proeulia* females deposit plates of 15 to 40 eggs on the leaves (Campos *et al*., 1981); the hatched larvae form a protective tube by folding a leaf or by joining leaves by a silk thread. In spring, they begin to feed on rolled leaves, in flowers and fruits. In summer, it takes 35 to 50 days to complete the life cycle (Artigas, 1994; Campos *et al*., 1981). Larvae hatched in autumn spend winter diapausing inside a cocoon in twigs, attached to leaves or in protected places. These larvae are reported to complete their development in sheltered places (Artigas, 1994; Campos *et al*., 1981).
- Pupation takes place on the leaves. Two annual generations have been reported for *Proeulia* species, with the possibility of a third partial generation (Campos *et al*., 1981). However, two to four generations have been reported for *Proeulia auraria* (Alvarez & Gonzalez, 1982).
- To establish, larvae would have to successfully pupate and then emerge to find a suitable mate to establish a population.
- Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not all hosts (e.g. citrus where specific integrated pest management programs are used).

Probability of spread

Comparative assessment of those factors in the area of origin and in Australia considered pertinent to the expansion of the geographical distribution of the pest: **High**.

- Natural physical barriers (e.g. deserts/arid areas) may prevent long distance spread of these pests unaided but adults are capable of flight and larvae may be spread in infested host material.
- Short-distance dispersal occurs, as adults are mobile and able to rapidly move between host plants.
- The genus *Proeulia* is capable of flight with some species known to fly throughout the year. For example, *Proeulia auraria* is an abundant native insect in Chile and flies virtually throughout the year with flight peaks during January, April and September-November (Gonzalez, 1983).

- Environments (e.g. temperature, rainfall) similar to those in Chile occur in parts of Australia.
- Human activity can help the spread of these pests, as larvae associated with fruit may be moved around with the commodity.
- The relevance of natural enemies in Australia is not known.
- Because these species have multiple generations, are capable of flight and can be spread by humans in plant material their likelihood of spread is rated as high.

Probability of entry, establishment or spread

The overall likelihood that leafrollers will enter Australia as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within Australia: **Low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.3.7.2 Consequences

Consideration of the direct and indirect consequences of leafrollers: **Moderate**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — These pests are recorded as capable of causing direct damage to host plants such as *Vitis* and *Prunus* spp. Some of the leafrollers damage the leaves, buds and fruit of their hosts (Brown, 1999; Gonzales, 1983). *Proeulia* spp. potentially reduce the yield and value of crops through external damage to fruit that reduces its market value.
Any other aspects of the environment	**A** — There are no known consequences of these pests on other aspects of the environment but their introduction into a new environment may lead to competition for resources with native species.
Indirect consequences	
Eradication, control etc.	**D** — Programs to minimise the impact of these pests on host plants are likely to be costly and include pesticide applications and crop monitoring. A control program would have to be implemented in infested orchards to reduce fruit damage and yield losses, thereby increasing production costs. Eradication and control would be significant at the regional level. *Proeulia* spp. may potentially increase production costs by triggering specific controls as these are of quarantine concern to important trading partners.
Domestic trade	**C**— The presence of these pests in commercial production areas may have a significant effect due to any resulting interstate trade restrictions.
International trade	**D** — The presence of these pests in commercial production areas of a range of commodities (e.g. *Citrus, Vitis*, *Prunus*) may have a significant effect due to possible additional phytosanitary requirements for access to overseas markets where these pests are absent. For example *Proeulia* species are specifically of quarantine concern to China, Korea, Taiwan, Japan, Mexico and USA.
Environment	**A** — Although additional pesticide applications or other control activities would be required to control these pests on susceptible crops, and any indirect impact on the environment is unlikely to be discernable.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.3.7.3 Unrestricted risk estimate

The unrestricted risk estimate determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 1)**: Low**.

4.3.8 Thrips

Thrips are small and narrow-bodied insects commonly found feeding on leaves and stems. Grape thrips and western flower thrips are the most important species causing damage on grapes. Both species are found in grape-growing areas.

The thrips examined in this import risk analysis are:

- *Drepanothrips reuteri* Uzel [Thysanoptera: Thripidae] – Grape thrips;
- *Frankliniella australis* Morgan [Thysanoptera: Thripidae] – Chilean flower thrips; and
- *Frankliniella occidentalis* (Pergande) [Thysanoptera: Thripidae] – Western flower thrips.

The listed thrips species are recognised as significant pests of table grapes in Chile. Due to the recognised importance of the grape thrips and western flower thrips (WFT), these were used as the basis for the risk assessment.

4.3.8.1 Introduction and spread potential

Probability of importation

The likelihood that thrips will arrive in the PRA area with the importation of table grapes from Chile**: Low**.

- Grape thrips represent a large part of the thrips populations associated with table grapes in some areas of Chile and along with WFT are considered an important pest (Gonzalez, 1983; Ripa, 1994).
- Both WFT and grape thrips can scar berries with their feeding, which renders certain varieties unmarketable (UC-IPM, 2002). Table grapes with such symptoms may be detected during pre-export inspections.
- The female WFT has an external ovipositor with two opposable serrated blades that are used to cut through the plant epidermis and deposit eggs in the tissues below (Childers & Achor, 1995).
- The small size of thrips allows them to secrete themselves into small crevices and tightly closed plant parts. Adults and immature forms may hide within bunches (for example, in crevices on fruit stems).
- Thrips may be associated with the table grape pathway but these pests have not been intercepted on Chilean table grapes exported to New Zealand or Californian table grapes exported to Australia.

Probability of distribution

The likelihood that thrips will be distributed as a result of the processing, sale or disposal of table grapes from Chile, to the endangered area: **Moderate**.

- Adults and immature forms may hide within bunches (for example, in crevices on the fruit stems) and therefore remain with the commodity during distribution via wholesale or retail sale.

- The commodity may be distributed throughout Australia for retail sale. The intended use of the commodity is human consumption but waste material would be generated (e.g. vegetative parts of the cluster and discarded berries).
- These thrips could enter the environment directly from purchased fruit, from fruit at the point of sale, or through eggs that have hatched in discarded fruit or fruit waste before the fruit desiccates or decays.
- WFT is highly polyphagous and the adults and nymphs can disperse locally by wind-assisted flight (CABI/EPPO, 1997).

Probability of entry (importation x distribution)

The likelihood that thrips will enter the PRA area as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Low**.

- The overall probability of entry is determined by combining the probabilities of importation and of distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

Comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **High**.

- WFT is polyphagous (*Citrus*, Cucurbitaceae, *Phaseolus* and *Prunus*) and some of these hosts commonly found in the PRA area can act as hosts for these species.
- Depending on environmental conditions and nutrient levels, female WFT lay 130–230 eggs during their lifetime (CABI, 2004). Eggs are deposited in leaves, bracts, and petals and hatch in 2 to 4 days (Pfleger *et al*., 1995). The development time from egg to adult is 7 to 13 days when temperatures range from 18 to 23ºC (CABI, 2004).
- Thrips can have a high reproductive potential even in the absence of males (i.e. under glasshouse conditions *Frankliniella occidentalis* can have 15 generations per year).
- Many Australian environments would be suitable for the thrips' survival and reproduction as these species are noted for their ecological and physiological tolerance. WFT is already established in some areas of Australia.
- Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not all hosts (e.g. citrus where specific integrated pest management programs are used).

Probability of spread

Comparative assessment of those factors in the area of origin and in the PRA area considered pertinent to the expansion of the geographical distribution of the pest: **High**.

- Natural physical barriers (e.g. deserts/arid areas) may prevent these pests spreading unaided but adults are capable of flight and adults and immature forms may spread undetected via the movement of fruit or infested vegetative host material.
- WFT hatch large numbers of young, have rapid reproductive cycles, and increase their population faster than their predators (Mound & Teulon 1995).
- The relevance of natural enemies in Australia is not known.
- Similar environments (e.g. temperature, rainfall) occur in Chile and Australia.

Probability of entry, establishment or spread

The overall likelihood that thrips will enter the PRA area as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within Australia: **Low**.

- The probability of entry, of establishment and of spread is determined by combining the probabilities of entry, establishment and spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.3.8.2 Consequences

Consideration of the direct and indirect consequences of thrips: **Low**.

Criterion	Estimate
Direct consequences	
Plant life or health	**C** — WFT is probably the most serious pest of floriculture crops in the world (Parrella, 1995). WFT damage plants directly by feeding and laying eggs on the plant, and indirectly by acting as vectors for viruses such as tomato spotted wilt virus and impatiens necrotic spot virus. In some host species, WFT feeding causes flower or leaf buds to abort or emerging leaves to become distorted (Childers & Achor, 1995).
Any other aspects of the environment	**A** — There are no known direct consequences of these species on any aspects of the environment but their introduction into a new environment may lead to competition for resources with native species.
Indirect consequences	
Eradication, control etc.	**B** — Additional programs to minimise the impact of these pests on host plants may be necessary. Existing control programs may be effective for some hosts (e.g. broad spectrum pesticide applications) but not all hosts (e.g. where specific integrated pest management programs are used).
Domestic trade	**C** — The presence of these pests in commercial production areas may have a significant effect due to any resulting interstate trade restrictions on a wide range of commodities. Interstate measures are currently in place for WFT.
International trade	**C** — The presence of these pests in commercial production areas of a range of commodities (e.g. *Vitis, Prunus*) may have a significant effect due to any limitations to access to overseas markets where these pests are absent.
Environment	**A** — Although additional pesticide applications or other control activities would be required to control these pests on susceptible crops, any impact on the environment is unlikely to be discernible.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.3.8.3 Unrestricted risk estimate

The unrestricted risk estimate determined by combining the overall 'probability of entry, establishment or spread' with the 'consequences' using the risk estimation matrix (Table 1)**: Very low**.

4.3.9 Phomopsis cane and leaf blight

Phomopsis cane and leaf blight is an important disease in several viticultural regions of the world (Machowicz-Stefaniak *et al*., 1991; Nair *et al*., 1994). The disease caused by *Phomopsis viticola*, is economically important because of the crop loss it can cause and because of the cost of spray programs applied for disease control (Clarke *et al*., 2004).

Two different types (type 1 and type 2) of *P. viticola* have been identified to date. In some areas of Australia, *P. viticola* type 2 causes considerable damage to canes through the development of lesions, scarring and eventual breakage of the cane (Rawnsley & Wicks, 2002). Phomopsis cane and leaf blight can affect most parts of the grapevine, including canes, leaves, rachises, flowers, tendrils and berries and can cause vineyard losses by weakening canes, damaging leaves, infecting cluster stems (which can result in poor fruit development and premature fruit drop) and infecting berries (resulting in a fruit rot near harvest).

The fungus examined in this import risk analysis is:

- **Phomopsis viticola* (Sacc.) Sacc. type 2 – Phomopsis cane and leaf blight.

* WA only – type 2 is a quarantine pest for the State of Western Australia due to its absence from this State.

While *P. viticola* is recorded in Chile, there is no published evidence that *P. viticola* type 2 is present in Chile. Biosecurity Australia will consider this fungus, of quarantine concern for Western Australia, in this IRA until the status of this fungus has been clarified in Chile. Biosecurity Australia has obtained advice on *P. viticola* type 2 from independent experts on the risks posed by this fungus.

4.3.9.1 Introduction and spread potential

Probability of importation

The likelihood that *P. viticola* type 2 will arrive in the PRA area with the importation of table grapes from Chile**: Low**.

- All parts of grape bunches (berries and rachises) are susceptible to infection throughout the growing season (Ellis & Erincik, 2002).
- Berry infection can occur throughout the growing season; however most fruit rot infections probably occur early in the season. Once inside green tissues of the berry, the fungus becomes latent, and the disease does not continue to develop. Infected berries remain without symptoms until late in the season when the fruit matures (Ellis & Erincik, 2002).
- Recently infected fruit may not display symptoms and may be packaged for export.
- Infection, initiated at bud break if prolonged, cool, wet periods prevail, primarily occurs on leaves, canes and stems. If cool, wet conditions continue, the infections will spread to cluster stems that may blight and become brittle from numerous infections, resulting in breakage of the cluster and loss of the fruit.
- Normal agronomic management practices within Chile would ensure that the disease, if present, is managed to limit bunch infection.
- Infection will result either in fruit loss or fruit rot. Infected fruit/bunches, if symptoms are visible, are likely to be discarded prior to packaging for quality purposes.

Probability of distribution

The likelihood that *P. viticola* type 2 will be distributed to the endangered area as a result of the processing, sale or disposal of table grapes from Chile: **Low**.

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

Probability of entry (importation x distribution)

The likelihood that *P. viticola* type 2 will enter the PRA area as a result of trade in table grapes from Chile and be distributed in a viable state to the endangered area: **Very low**.

- The overall probability of entry is determined by combining the probabilities of importation and of distribution using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

Probability of establishment

Comparative assessment of factors in the source and destination areas considered pertinent to the ability of the pest to survive and propagate: **Low**.

- *P. viticola* type 2 has a narrow host range including *Vitis* spp. and *Parthenocissus quinquefolia*. These hosts are widespread in the PRA area.
- The fungus overwinters in lesions as mycelium and pycnidia in bark (Hewitt & Pearson, 1990), and in dormant buds (Jailloux & Bugaret, 1987; Mostert *et al*., 2000).
- The fungus produces dark pycnidia that produce α and β conidia (Sergeeva *et al*., 2003).
- In cool climates, the fungus may remain active throughout the growing season (Emmett & Wicks, 1994) but generally the most active growth of the fungus occurs during spring and autumn (Rawnsley & Wicks, 2002).
- The development of this disease is greatly influenced by climatic conditions, inoculum density and host growth stage. Environmental conditions must be favourable for development and subsequent spread of the disease (Rawnsley & Wicks, 2002).
- Prolonged periods of rain and cool weather favour disease development. Pycnidium production requires cool temperatures (Rawnsley & Wicks, 2002). At least 10 hours of rain, combined with relatively low temperatures are required for spores to be produced and a further 8-10 hours of moist conditions for infection to occur (Emmett *et al*., 1992).
- Spores require water to germinate and infection has been found to occur within a few hours in free water or 100% humidity (Hewitt & Pearson, 1990). The optimum temperature for spore germination and fungal growth is 23ºC (Patil *et al*., 1981). Berry infection is favoured by 20-30 hour wet periods during flowering (Rawnsley & Wicks, 2002).
- Disposal of infected grape bunches may occur in the proximity to susceptible grape varieties. However, the likelihood that the additional infection requirements of new bud growth in spring, associated with a prolonged period of cool, wet conditions and transmission of the spores by rain splash or insect transmission would occur in unison are low.
- The predominantly hot and dry climatic conditions that occur in the grape growing areas in Western Australia, at the time favourable for disease transmission, are not favourable for the establishment of the disease.

Probability of spread

Comparative assessment of those factors in the area of origin and in Western Australia considered pertinent to the expansion of the geographical distribution of the pest: **Low**.

- The fungus spreads mostly within the vine, rather than from vine to vine, therefore, spread within the vineyard is localised (Rawnsley & Wicks, 2002).

- Long distance dispersal to new viticultural areas occurs primarily through the transfer of infected or contaminated propagation materials such as budwood, cane cuttings and nursery stock (Hewitt & Pearson, 1990; Creecy & Emmett, 1990).
- The fungus may overwinter within woody parts of the vine and in pycnidia on infected canes and spurs. There are currently no restrictions on the movement of grapevine material within Western Australia.
- Hot and dry climatic conditions retard disease development and are not favourable for the spread of the disease.
- Existing control programs for *P. viticola* type 1 in Western Australia may be effective against *P. viticola* type 2.
- Similar environments (e.g. temperature, rainfall) occur in Chile and Western Australia.

Probability of entry, establishment or spread

The overall likelihood that *P. viticola* type 2 will enter the PRA area as a result of trade in table grapes from Chile, be distributed in a viable state to suitable hosts, establish in that area and subsequently spread within Western Australia: **Very low**.

- The probability of entry, establishment or spread is determined by combining the probabilities of entry, of establishment and of spread using the matrix of 'rules' for combining descriptive likelihoods (Table 3).

4.3.9.2 Consequences

Consideration of the direct and indirect consequences of *P. viticola* type 2: **Moderate**.

Criterion	Estimate
Direct consequences	
Plant life or health	**D** — *Phomopsis viticola* type 2 is a serious pathogen of grapes in several viticultural regions of the world (Machowicz-Stefaniak *et al*., 1991; Nair *et al*., 1994). The disease is economically important because of the crop loss it can cause. Although reports in Australia have indicated 20-38% yield losses (Nair *et al*., 1994), it is unknown whether this figure is reflective of *Phomopsis* infection only or a combination of other factors affecting grapevines (Rawnsley & Wicks, 2002).
Any other aspects of the environment	**A** — There are no known direct consequences of this disease on the natural environment.
Indirect consequences	
Eradication, control etc.	**C** — Programs to minimise the impact of *P. viticola* type 2 are likely to be costly and include fungicide applications (Clarke *et al*., 2004) and crop monitoring. Existing control programs for *P. viticola* type 1 in Western Australia may be effective against the *P. viticola* type 2.
Domestic trade	**A** — The presence of *P. viticola* type 2 in the commercial grapes production areas of Western Australia is estimated to have consequences that are unlikely to be discernible at the regional level and of minor significance at the local level. It is doubtful that there would be any resulting interstate trade restrictions on grapes as *P. viticola* type 2 is present in other states.
International trade	**A** — The disease is present within other viticultural regions of Australia and many grape-growing regions of the world (Machowicz-Stefaniak *et al*., 1991; Nair *et al*., 1994). There would be no significant effects on international trade.
Environment	**A** — Additional fungicide applications or other control activities would be required to control the disease on susceptible grape varieties.

Note: Refer to Table 5 (The assessment of local, district, regional and national consequences) and text under the 'Method for assessing consequences' section for details on the method used for consequence assessment.

4.3.9.3 Unrestricted risk estimate

The unrestricted risk estimate is determined by combining the overall 'probability of entry, of establishment and of spread' with the 'consequences' using the risk estimation matrix (Table 1): **Very low**.

4.3.10 Black widow spider

- *Latrodectus mactans* (Fabricius) [Araneae: Theridiidae] – Black widow spider

Latrodectus mactans is not a plant pest and therefore is not subject to phytosanitary action. However, it is considered to be potentially associated with table grapes imported from Chile (see Pest Categorisation section) and is recognised as having an impact on human health and potential impacts on the environment (see below). Therefore, the methodology described for the other pests was not used for this particular risk assessment.

Applications to import this species into Australia (i.e. an importer who actively wanted to bring specimens into Australia) would be assessed outside of the IRA process. Based on similar requests it is likely that, if approved, such an import would require an Import Permit and containment of the specimens in a high security quarantine facility.

A comprehensive assessment of the association of spiders (including black widow spider) with table grapes, risk mitigation measures and impact on human health is provided in a series of documents produced by the New Zealand Ministry of Agriculture and Forestry and Ministry of Health:

- Pest Risk Assessment of Spiders Associated with Table Grapes from United States of America (State of California), Australia, Mexico and Chile. Ministry of Agriculture and Forestry, Wellington, New Zealand (NZ MAF, 2002b);
- Mitigation Measures for the Management of Risks Posed by Exotic Spiders Entering New Zealand in Association with Imported Table Grapes. Ministry of Agriculture and Forestry, Wellington, New Zealand (NZ MAF, 2002c);
- Towards a Health Impact Assessment Relating to Venomous Spiders Entering New Zealand in Association with Imported Table Grapes: A Discussion Document. Ministry of Health, Wellington, New Zealand (NZ MAF, 2002d); and
- Review of Submissions (to the above 3 documents). September 2002. Ministry of Agriculture and Forestry, Ministry of Health and Department of Conservation (NZ MAF, 2002e).

Based on the potential association of *L. mactans* with table grapes from Chile, the demonstrated ability of other *Latrodectus* species to survive in Australia and the risks identified by the New Zealand Ministry of Agriculture and Forestry and Ministry of Health, it is concluded that the unrestricted risk associated with the species is not acceptable.

4.4 Risk Assessment Conclusion

Table 9 summarises the detailed risk assessments and provides unrestricted risk estimates for the quarantine pests considered to be associated with table grapes from Chile.

Chilean false red mite, weevils, mealybugs and leafrollers were assessed to have an unrestricted risk estimate of low. Spider mites were assessed to have an unrestricted risk of negligible and scales, thrips and *P. viticola* type 2 were assessed to have an unrestricted risk of very low.

Ceratitis capitata (Mediterranean fruit fly, Medfly) was assessed to have an unrestricted risk of "moderate". As indicated in the risk assessment, Medfly is not considered a pest of table grapes in Chile, as it is not established but it has been detected previously and eradicated. Black widow spider and pest plants were assessed to have an unrestricted risk of not acceptable.

The unrestricted risk estimates for some of the quarantine pests exceed Australia's ALOP and risk management measures are required. Specific risk management measures are therefore required to be applied to import table grapes from Chile into Australia to adequately address the potential quarantine risk.

Table 9: Unrestricted risk summary

Pest name	**Probability of**						**Consequences**	**Unrestricted Risk**
	Entry			**Establishment**	**Spread**	**Overall probability of entry, establishment and spread**		
	Importation	**Distribution**	**Overall probability of entry**					
Spider mites	Low	Very low	Very low	Moderate	Moderate	Very low	Low	Negligible
Chilean false red mite	High	Low	Low	High	Moderate	Low	Moderate	**Low**
Weevils	High	Low	Low	High	Moderate	Low	Moderate	**Low**
Mediterranean fruit fly	Low	Moderate	Low	High	Moderate	Low	High	**Moderate**
Mealybugs	High	Moderate	Moderate	High	High	Moderate	Low	**Low**
Scales	High	Low	Low	High	Moderate	Low	Low	Very low
Leafrollers	Moderate	Moderate	Low	High	High	Low	Moderate	**Low**
Thrips	Low	Moderate	Low	High	High	Low	Low	Very low
Phomopsis viticola type 2	Low	Low	Very low	Low	Low	Very low	Moderate	Very low
Black widow spider								Not acceptable
Pest plants								Not acceptable

Table 10 provides the final list of quarantine pests of table grapes from Chile that have been assessed to have an unrestricted risk estimate above Australia's ALOP. These pests require the use of risk management measures in addition to standard practices used in the production of commercial table grapes in Chile to meet Australia's ALOP. The risk management measures are described in the following section.

Table 10: Quarantine pests of table grapes from Chile assessed to have unrestricted risk estimates above Australia's ALOP

Pest type	Common name
ARTHROPODS	
Acari (mites)	
Brevipalpus chilensis Baker [Acari: Tenuipalpidae]	Chilean false red mite
Coleoptera (weevils)	
Geniocremnus chiliensis (Boheman) [Coleoptera: Curculionidae]	Tuberous pine weevil
Naupactus xanthographus (Germar) [Coleoptera: Curculionidae]	South American fruit tree weevil
Diptera (flies)	
Ceratitis capitata (Wiedemann) [Diptera: Tephritidae]	Mediterranean fruit fly
Hemiptera (leafhoppers, mealybugs, psyllids, sharpshooters, scales)	
Pseudococcus calceolariae (Maskell) [Hemiptera: Pseudococcidae]	Citrophilus mealybug*
Pseudococcus maritimus (Ehrhorn) [Hemiptera: Pseudococcidae]	Grape mealybug
Lepidoptera (leafrollers, moths, butterflies)	
Accuminulia buscki Brown [Lepidoptera: Tortricidae]	Tortricid leafroller
Accuminulia longiphallus Brown [Lepidoptera: Tortricidae]	Tortricid leafroller
Chileulia stalactitis (Meyrick) [Lepidoptera: Tortricidae]	Grape berry moth
Proeulia auraria (Clarke) [Lepidoptera: Tortricidae]	Chilean fruit tree leafroller
Proeulia chrysopteris (Butler) [Lepidoptera: Tortricidae]	Fruit leafroller
Proeulia triquetra Obraztsov [Lepidoptera: Tortricidae]	Grape leafroller
CONTAMINATING PESTS	
Latrodectus mactans (Fabricius) [Araneae: Theridiidae]	Black widow spider
PEST PLANTS	
Carduus nutans L.	Nodding thistle
Cuscuta suaveolens Ser.	Fringed dodder
Eragrostis virescens Presl.	Mexican lovegrass
Euphorbia lathyrus L.	Caper spurge
Euphorbia peplus L.	Petty spurge
Galium aparine L.	Cleavers
Rumex conglomeratus Murr.	Clustered dock
Rumex crispus L.	Curled dock
Rumex longifolius DC.	Long leaved dock
Sonchus arvensis L.	Corn sowthistle
Sorghum halepense (L.) Pers.	Johnson grass
Taeniatherum caput-medusae Boiss	Medusa-head

* WA only – this species is a quarantine pest for the State of Western Australia due to its absence from this State.

5 PEST RISK MANAGEMENT

Pest risk management evaluates and selects options for measures to reduce the risk of entry, establishment or spread of quarantine pests assessed to have an unrestricted risk estimate above Australia's ALOP via the importation of commercially produced table grapes from Chile, i.e. fruit from commercial production sites and subjected to standard cultivation, harvesting and packing activities.

It is important to note that it is only appropriate for the unrestricted risk estimates to take into account the minimum border procedures used by relevant government agencies and not those measures approved by such agencies that are intended to mitigate risks associated with the commodity itself. The minimum procedures include verifying that the commodity is as described in the shipping documents and identifying external and internal contaminations of containers and packaging. In order to have least trade restrictive measures, evaluation of restricted risk management options started with consideration of the use of a 600-unit inspection in detecting quarantine pests requiring risk management, and the subsequent remedial actions or treatments that might be applied if a live quarantine pest is intercepted.

The standard AQIS sampling protocol requires inspection of 600 units, for quarantine pests in systematically selected random samples per homogeneous consignment or lot. The unit for table grapes is defined as one bunch. Biometrically, if no pests are detected by the inspection, this size sample achieves a confidence level of 95% that not more than 0.5% of the units in the consignment are infested/infected. The level of confidence depends on each fruit in the consignment having about the same likelihood of being affected by a quarantine pest and the inspection technique being able to reliably detect all quarantine pests in the sample. If no live quarantine pests are detected in the sample, the consignment is considered to be free from quarantine pests and would be released from quarantine. Where a live quarantine pest is intercepted in a sample, the remedial actions or treatments may (depending on the location of the inspection) include:

- withdrawing the consignment from export to Australia;
- re-export of the consignment from Australia;
- destruction of the consignment; or
- treatment of the consignment and re-inspection to ensure that the pest is no longer viable.

It should be emphasised that inspection is not a measure that mitigates the risk of a pest. It is the remedial action or treatment that can be taken based on the results of the inspection that would reduce a pest risk.

Biosecurity Australia considers that the risk management measures proposed in this document will provide an appropriate level of protection against the pests identified in the risk assessment. Various risk management measures may be suitable to manage the risks associated with table grapes from Chile. Biosecurity Australia will consider any other measures suggested by stakeholders that provide an equivalent level of phytosanitary protection.

Biosecurity Australia has considered stakeholders comments on the draft IRA report to develop proposed risk management measures. Biosecurity Australia considers that the proposed risk management measures below are commensurate with the identified risks and, unless stakeholders suggest equivalent measures, the proposed measures will form the basis of final import conditions for table grapes from Chile.

Biosecurity Australia invites comment on the economic and technical feasibility of these proposed measures. In particular, technical comments are welcome on the appropriateness of the measures and any alternative measures that stakeholders consider would achieve the identified objectives. Note that Biosecurity Australia regards the measures proposed below to be consistent with measures that are currently in place for the importation of table grapes from New Zealand and from the USA.

5.1 Risk Management Measures and Phytosanitary Procedures

The measures described below form the basis of proposed import conditions for table grapes from Chile. These measures are detailed in the section entitled Draft Import Conditions.

The following measures and phytosanitary procedures are proposed to mitigate the risks identified in the IRA:

- pest free areas for Mediterranean fruit fly;
- methyl bromide fumigation (either pre-shipment or on-arrival) for Chilean false red mite;
- pre-shipment fumigation with SO_2/CO_2 for black widow spider;
- inspection and remedial action for weevils, mealybugs and leafrollers; and
- operational systems for the maintenance and verification of the phytosanitary status of table grapes.

5.1.1 Mediterranean fruit fly

Mediterranean fruit fly (Medfly) has been assessed to have an unrestricted risk estimate of moderate and measures are therefore required to manage this risk.

Visual inspection of fruit alone is not considered to be an appropriate risk management measure in view of the level of risk identified and because clear visual external signs of infestation (particularly in recently infested fruit) may not be present. If infested fruit was not detected at inspection, Medfly may enter, establish or spread in Australia. Other identified options to manage risks associated with Medfly are either the use of disinfestation treatments or by sourcing fruit from pest free areas.

5.1.1.1 Pest free area for Mediterranean fruit fly

SAG has proposed that product for export to Australia would be sourced from Medfly free areas. Chile is considered a “Pest Free Area” for Medfly. The objective of this risk management measure is to ensure that table grapes exported to Australia are not infested with Medfly. SAG will verify maintenance of this status for this pest by routine crop monitoring/surveillance. Technical information justifying Chile’s freedom from Medfly has been provided to Biosecurity Australia by SAG and updates on detections and eradication activities are provided on an on-going basis. SAG must continue to notify

Biosecurity Australia of the status of Medfly and any associated detections and eradication activities in Chile.

The finding of any live or dead Medfly associated with consignments of table grapes from Chile would indicate non-compliance with the pest free area status. If any live or dead Medflies are detected at inspections, the export program to Australia will be suspended until Biosecurity Australia and SAG are satisfied that appropriate corrective action has been taken to re-instate the pest free area status for Medfly or another risk management measure has been developed, and approved, as an alternative.

5.1.2 Chilean false red mite

Chilean false red mite has been assessed to have an unrestricted risk estimate of low and measures are therefore required to manage this risk.

Visual inspection alone is not considered to be an appropriate risk management option as these mites are minute and are not visible to the naked eye. If infested fruit was not detected at inspection, *Brevipalpus chilensis* may enter, establish or spread. Other identified options to manage risks associated with this pest are either the use of disinfestation treatments or by sourcing fruit from pest free areas.

5.1.2.1 Methyl bromide fumigation for Chilean false red mite (either pre-shipment or on-arrival)

SAG has not proposed table grape export areas in Chile as pest free areas for *Brevipalpus chilensis*. Methyl bromide fumigation is considered to be the only feasible measure for this pest to reduce the risk estimate from low to a very low level. Therefore, mandatory fumigation with methyl bromide is proposed for all export shipments in accordance with the relevant AQIS standards. The objective of this risk management measure is to reduce the unrestricted risk estimate to a level below Australia's ALOP.

The proposed fumigation measure may be completed either in Chile under full pre-clearance arrangements or on-arrival in Australia under a partial pre-clearance program. Under a partial pre-clearance program, fumigation on-arrival must occur at the first port of call, with no land bridging of consignments until the goods have cleared quarantine (i.e. the shipments are not released by AQIS until after the successful completion of the treatment).

Fumigation with methyl bromide must be carried out for a duration of 2 hours according to the specifications below:

- 32g/m^3 at a grape pulp temperature of 21ºC or greater;
- 40g/m^3 at a grape pulp temperature of 16ºC or greater but less than 21ºC; or
- 48g/m^3 at a grape pulp temperature of 10ºC or greater but less than 16ºC.

The loading ratio should not exceed 80% of the chamber volume. Fruit is not to be fumigated if the grape pulp temperature is less than 10ºC.

5.1.3 Black widow spider

The black widow spider (BWS) is not a plant pest and therefore phytosanitary measures cannot be applied against them. However, spiders have been assessed to have an unacceptable unrestricted risk estimate and sanitary measures are therefore required to manage that risk. Visual inspection alone is not considered to be an appropriate risk management option in view of the health risks for inspectors and the cryptic habit of individual spiders (which may conceal themselves in the carton rather than the inspected bunch). If infested fruit was not detected at inspection, these spiders may enter, establish or spread in Australia. Other identified options to manage risks associated with spiders are either the use of disinfestation treatments or by sourcing fruit from pest free areas.

5.1.3.1 Pre-shipment fumigation with SO_2/CO_2 for black widow spider

SAG has not proposed table grape export areas in Chile as pest free areas for BWS. Treatment by pre-export treatment with SO_2/CO_2 is known to be normal commercial practice in Chile and is considered appropriate to reduce the risk estimate to an acceptable level. The efficacy of the SO_2/CO_2 treatment against BWS is reported as 92% under best conditions (quoted in NZ MAF, 2002b) and 87-99% depending on the packaging used (quoted in NZ MAF, 2002e). Efficacy of the treatment against juveniles and eggs sacs of BWS is unknown (quoted in NZ MAF, 2002e). Methyl bromide fumigation as a stand-alone treatment at the proposed dosages for mites is reported as not killing BWS. Higher methyl bromide dosage rates (e.g. $80 g/m^3$) would be required to kill BWS (quoted in NZ MAF, 2002c). However, it is considered that the combination of pre-export SO_2/CO_2 treatment and pre-export or on-arrival methyl bromide treatment would provide acceptable fatality rates of BWS. This treatment combination currently applies to table grapes imported into Australia from California. There have been no rejections of Californian table grapes in Australia due to live interceptions of BWS.

Therefore, it is proposed that all shipments undergo normal commercial pre-export fumigation with a mixture of sulphur dioxide and carbon dioxide (SO_2/CO_2). The objective of this risk management measure is to reduce the survival of any BWS associated with packed table grapes or packaging. Under the proposed fumigation arrangement, the palletised table grapes would be treated with a mixture of 1% sulphur dioxide and 6% carbon dioxide for a minimum of 30 minutes.

5.1.4 Weevils, mealybugs and leafrollers

Weevils, mealybugs and leafrollers have been assessed to have an unrestricted risk estimate of low and measures are therefore required to manage this risk.

5.1.4.1 Inspection and remedial action

Visual inspection would involve the examination of a sample of table grapes to detect the presence of the weevils, mealybugs and leafrollers. Remedial action when pests are present is proposed as an appropriate risk management option for these pests, given trained inspectors can readily detect these pests.

The objective of this measure is to ensure that consignments of table grapes from Chile infested with these pests can be readily identified and subjected to appropriate remedial action. This measure is considered to reduce the risk associated with weevils, mealybugs and leafrollers to a level below Australia's ALOP.

In response to the release of the draft IRA report for stakeholder comment, several stakeholders questioned the proposed mandatory fumigation of leafrollers and weevils, as outlined in the draft IRA report. The draft IRA report had determined that visual inspection alone was not considered to be an appropriate risk management option in view of the level of risk identified and because clear visual external signs of infestation (particularly in recently infested bunches of grapes) may not be present.

Biosecurity Australia has reassessed the unrestricted risk for leafrollers and weevils and determined that the unrestricted risk for both of these groups to be low rather than moderate, as determined in the draft IRA report. In view of the downgrading of the unrestricted risk estimate from moderate to low and comments from stakeholders regarding the efficacy of phytosanitary inspection as a risk mitigation measure for leafrollers and weevils, it is proposed mandatory fumigation for these groups will not be required.

5.1.5 Operational systems for the maintenance and verification of phytosanitary status

It is necessary to have a system of operational procedures in place to ensure that the phytosanitary status of table grapes from Chile is maintained and verified during the process of production and export to Australia. Biosecurity Australia proposes a system that is consistent with and equivalent to the systems currently in place for the importation of table grapes from California and New Zealand. Details of this system, or of an equivalent one, will be determined by agreement with SAG.

The system is based on either full pre-clearance arrangements or partial pre-clearance. Precedents to date indicate that advantages of the partial pre-clearance option include: i) fumigation can be undertaken on-arrival in Australia, and ii) following phytosanitary inspection in Chile, any consignments that may be found with quarantine pests risks that are not managed by methyl bromide fumigation, are not exported from Chile.

The proposed system of operational procedures for the production and export of table grapes from Chile to Australia would include:

- registration of vineyards and fumigation facilities;
- packaging and labelling compliance;
- specific conditions for storage and movement of produce;
- pre-export phytosanitary inspection by SAG;
- phytosanitary certification by SAG;
- phytosanitary inspection by AQIS (if pre-clearance is to be used);
- on-arrival phytosanitary inspection by AQIS, including document compliance examination (if consignments have not been pre-cleared); and
- document compliance examination only by AQIS (if consignments have been pre-cleared).

5.1.5.1 Registration of vineyards and fumigation facilities

All table grapes for export must be sourced only from registered export vineyards. Copies of the registration records must be available for audit by AQIS if requested. SAG is required to register all export vineyards and export fumigation facilities prior to the commencement of exports. Facilities for SO_2/CO_2 fumigation in Chile are required to comply with SAG standards for export grade facilities. Facilities for methyl bromide fumigation in Australia and Chile are to comply with or be equivalent to the relevant AQIS standards.

The objective of this procedure is to ensure that vineyards and fumigation facilities from which table grapes are sourced can be identified. This is to allow trace back to individual vineyards and fumigation facilities in the event of non-compliance and for audit (of fumigation facilities). For example, if live pests are intercepted on fumigated product, the ability to identify a specific fumigation facility allows the investigation and corrective action to be targeted rather than applying to all possible facilities.

5.1.5.2 Packaging and labelling

All table grapes for export must be free from regulated articles[4] (e.g. trash) and pest plant seeds of quarantine concern to Australia. Table grapes must be packed in a way that is demonstrated to allow efficacious treatment with SO_2/CO_2 and subsequently with methyl bromide. No unprocessed packing material of plant origin will be allowed. All wood material used in packaging of table grapes must comply with the AQIS conditions, as set out in "Cargo containers: quarantine aspects and procedures" (AQIS, 1996).

All boxes must be labelled with the vineyard registration number and boxes/pallets with the fumigation facility number. Palletised product is to be identified by attaching a uniquely numbered pallet card to each pallet or part pallet to enable trace back to registered vineyards.

The exporter/freight forwarder must complete a Notice of Intention to Export (NOI) prior to any pre-clearance. The NOI will describe the pallets (by pallet card number or other method approved by AQIS) that the exporter wants included in the inspection lot. The NOI must be presented to the AQIS pre-clearance officer prior to inspection, and will be signed/stamped by AQIS as a record of inspection and the precleared status of the produce.

The objectives of this procedure are to ensure that:

- The table grapes exported to Australia are not contaminated by quarantine pest plants or regulated articles (which may vector pests identified as not on the pathway and pests not known to be associated with table grapes);
- Unprocessed packing material (which may vector pests identified as not on the pathway and pests not known to be associated with table grapes) is not imported with the table grapes;
- The table grapes are packaged in such a way as to allow effective application of the required chemical treatments (SO_2/CO_2 and methyl bromide); and
- The packaged table grapes are labelled in such a way as to identify the vineyard and fumigation facility and whether they have been pre-cleared or not. Table grapes not identified as having been pre-cleared would be assumed to not be pre-cleared and therefore still require on-arrival inspection by AQIS.

5.1.5.3 Specific conditions for storage and movement of produce

Packed product and packaging is to be protected from pest contamination during and after packing, during storage and during movement between locations (that is, packing house to cool storage/depot, to inspection point, to export point).

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4 The IPPC defines regulated article as "any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved.

Product for export to Australia that has been inspected and certified by SAG must be maintained in secure conditions that will prevent mixing with fruit for export to other destinations.

Security of the consignment is to be maintained until release from quarantine in Australia.

SAG, in consultation with Biosecurity Australia/AQIS, is to develop arrangements for secure storage and movement of produce.

The objective of this procedure is to ensure that the phytosanitary status of the product is maintained during storage and movement.

5.1.5.4 Phytosanitary inspection by SAG

SAG will inspect all consignments in accordance with official procedures for all visually detectable quarantine pests and other regulated articles. Sample rates must achieve a confidence level of 95% that not more than 0.5% of the units in the consignment are infested/infected. This equates to a level of zero units infested by quarantine pests in a random sample size of 600 units from the homogenous lot in the consignment[5]. The 600-unit sample must be selected randomly from every lot[6] in the consignment.

Detection of live quarantine pests or other regulated articles will result in failure of the consignment. If a consignment fails inspection by SAG, the exporter will be given the option of treatment and re-inspection of the consignment or removal of the consignment from the export pathway.

Records of the interceptions made during these inspections (live or dead quarantine pests, and regulated articles) are to be maintained by SAG and made available to Biosecurity Australia as requested. This information will assist in future reviews of this import pathway and consideration of the appropriateness of the phytosanitary measures that have been applied.

5.1.5.5 Phytosanitary certification by SAG

SAG will issue a phytosanitary certificate for each consignment after completion of the pre-export fumigation treatments (as appropriate) and pre-export phytosanitary inspection. The objective of this procedure is to provide formal documentation to AQIS verifying that the relevant measures have been undertaken offshore. Each phytosanitary certificate is to contain the following information:

Additional declarations:

> *"The grapes in this consignment have been produced in Chile in accordance with the conditions governing entry of fresh table grapes to Australia and inspected and found free of quarantine pests"*

consistent with International Standards for Phytosanitary Measures No. 7 *Export Certification Systems* (FAO, 1997).

5 A consignment is the number of boxes of table grapes from shipment from Chile to Australia covered by one phytosanitary certificate.

6 An inspection lot is the number of boxes presented for a single phytosanitary inspection.

If pre-clearance has been undertaken:

"AQIS pre-clearance inspection undertaken in Chile in accordance with the Work Plan For The Pre-clearance of Chilean Table Grapes to Australia <insert date>*"*

Note: The Work Plan will be developed between AQIS and SAG following the finalisation of this IRA.

5.1.5.6 Pre-clearance phytosanitary inspection

After issue of phytosanitary certification by SAG, AQIS will inspect all consignments in accordance with official procedures for all visually detectable quarantine pests and regulated articles. Sample rates must achieve a 95% confidence level that not more than 0.5% of the units (grape bunches) in the consignment are infested. This equates to a level of zero units infested by quarantine pests in a random sample size of 600 units from the homogenous lots in the consignment. The 600-unit sample must be selected randomly from every lot in the consignment. The detection of live quarantine pests and/or regulated articles (including pest plants and trash) will result in the failure of a consignment.

The objective of this procedure is to ensure that table grapes exported to Australia do not contain quarantine pests or regulated articles, comply with packing and labelling requirements, have undergone SO_2/CO_2 treatment and methyl bromide fumigation.

Records of the interceptions made during these inspections (live or dead quarantine pests, and regulated articles) are to be provided to SAG and made available to AQIS/BA as requested. This information will assist in future reviews of this import pathway and consideration of the appropriateness of the phytosanitary measures that have been applied.

5.1.5.7 On-arrival phytosanitary inspection by AQIS

Consignments inspected by AQIS under pre-clearance arrangements do not require on-arrival inspection in Australia by AQIS. AQIS will undertake a documentation compliance examination for consignment verification purposes prior to inspection and release from quarantine. However, for consignments that undergo on-arrival methyl bromide fumigation, AQIS may, in addition, perform monitoring inspections using the AQIS standard sampling plan. No land bridging of goods will be permitted unless goods have cleared quarantine. The detection of live quarantine pests and/or regulated articles will result in the failure of the inspection lot.

The objective of this procedure is to verify that the required measures have been undertaken.

5.2 Action for non-complying lots

Where inspection lots are found to be non-compliant with requirements, then remedial action must be taken as outlined at the beginning of this section. If product continually fails inspection, Biosecurity Australia/AQIS reserves the right to suspend the export program and conduct an audit of the table grape risk management systems in Chile. The program will recommence only after Biosecurity Australia/AQIS is satisfied that appropriate corrective action has been taken.

5.3 Uncategorised Pests

If an organism is detected on table grapes from Chile that has not been categorised, it will require assessment by Biosecurity Australia to determine its quarantine status and if phytosanitary action is required. The detection of any pests of quarantine concern not already identified in the analysis may result in the suspension of trade while a review is conducted to ensure that the existing measures continue to provide the appropriate level of phytosanitary protection for Australia.

5.4 Conclusion

The findings of this revised draft IRA report are based on a comprehensive analysis of relevant available scientific literature and existing import requirements for table grapes from USA and New Zealand.

Biosecurity Australia considers that the risk management measures proposed in the revised draft IRA report will provide an appropriate level of protection against the pests identified in the IRA. Various risk management measures may be suitable to manage the risks associated with table grapes from Chile. Biosecurity Australia will consider any other measures suggested by stakeholders that provide an equivalent level of phytosanitary protection.

6 DRAFT IMPORT CONDITIONS

The draft import conditions described below are based on the conclusions of the pest risk analysis contained in this revised draft IRA report. Specifically, these conditions reflect the proposed risk management measures in the previous section.

The components of the import conditions are summarised in dot point format below and the risk management measure that links with each component is given in brackets ( ).

- Registration of vineyards and fumigation facilities (5.1.5.1)
- ‘Pest Free Area’ for Mediterranean fruit fly (5.1.1.1)
- Notice of Intention to Export (5.1.5.2)
- Packing and labelling (5.1.4; 5.1.5.2)
- Storage (5.1.4; 5.1.5.3)
- Pre-export fumigation with SO_2/CO_2 (5.1.3.1)
- Pre-export inspection (5.1.5.4)
- Fumigation with methyl bromide (5.1.2.1)
- Phytosanitary certification (5.1.5.5)
- Pre-clearance phytosanitary inspection (5.1.5.6)
- On-arrival quarantine clearance by AQIS (5.1.5.7)
- Western Australia
- Review of policy

6.1 Registration of Vineyards and Fumigation Facilities

All table grapes for export must be sourced only from registered export vineyards. Servicio Agricola y Ganadero (SAG) is required to register all export vineyards and export fumigation facilities prior to commencement of exports to enable trace back in the event of non-compliance. Facilities for SO_2/CO_2 fumigation in Chile are required to comply with SAG standards for export grade facilities. Facilities for methyl bromide fumigation in Australia and Chile are to comply with, or be equivalent to, the relevant AQIS standards. Copies of the registration records for SO_2/CO_2 and methyl bromide treatment facilities in Chile must be provided to AQIS.

6.2 Pest Free Area for Mediterranean Fruit fly

Chile is considered a “Pest Free Area” for *Ceratitis capitata* (Mediterranean fruit fly). Technical information justifying Chile’s freedom from Mediterranean fruit fly has been provided to Biosecurity Australia/AQIS by SAG in the past and updates on detections and eradication activities are provided on an on-going basis. Biosecurity Australia/AQIS must continue to be notified of the status of Mediterranean fruit fly and any associated detections and eradication activities in Chile.

If any live or dead Mediterranean fruit flies are detected at inspection, the export program to Australia will be suspended until Biosecurity Australia/AQIS and SAG are satisfied that appropriate corrective action has been taken to reinstate the pest free area status or another risk management measure has been developed and approved.

6.3 Notice of Intention to Export

A Notice of Intention to Export (NOI) will be the primary document that confirms pre-clearance of Chilean table grape shipments. The NOI must be presented to the AQIS pre-clearance officer prior to inspection, and will be signed/stamped by AQIS as a record of inspection and the precleared status of the produce.

The exporter/freight forwarder must complete an NOI prior to any pre-clearance inspection. The NOI will describe the pallets (by pallet card number or other method approved by AQIS) that the exporter wants included in the inspection lot[7].

Participants are to keep appropriate records to enable trace back of product from the NOI issued, through the packinghouse (including pallet identification) to each supplying grower.

If the lot passes AQIS phytosanitary inspection, the AQIS officer will sign and stamp the NOI. The original document is to be retained by the AQIS officer and copies provided to SAG and the participant. Other copies specific to each consignment must be marked to identify which pallets from the original inspection lot are included in a consignment. Such copies will be attached to the appropriate phytosanitary certificate accompanying each specific consignment. Participants[8] may use copies of the NOI as inventory worksheets.

6.4 Packing and Labelling

All table grapes for export must be free from regulated articles and pest plant seeds of quarantine concern to Australia. Table grapes must be packed in a way that is demonstrated to allow efficacious treatment with SO_2/CO_2 and methyl bromide. No unprocessed packing material of plant origin will be allowed. All wood packing material used in packaging of table grapes must comply with the conditions stipulated in "Cargo containers: quarantine aspects and procedures" (AQIS, 1996) and as contained in the AQIS ICON database.

Perforated transparent polyvinyl bags within Toyon Kraft Veneer (TKV) boxes (that is, boxes with processed wood ends and sides made of Kraft paper) or plastic boxes are currently accepted for the import of table grapes into Australia from California. Biosecurity Australia/AQIS is willing to consider other forms of packaging subject to efficacy data for SO_2/CO_2 and methyl bromide treatment being provided by SAG.

Packaging material includes export cartons/boxes, plastic bags within which individual grape bunches are contained within the export carton/box, any plastic or paper used to line export cartons/boxes, any pallets upon which the cartons/boxes are stacked, and any strapping or other materials associated with the export pallet. All packaging (except pallets) must be new.

[7] A lot is the quantity of units (bunches) of grapes identifiable by its homogeneity of composition, for example source vineyard or fumigation facility. A lot may form part of a consignment, or comprise the entire consignment

[8] A "participant" is any treatment facility or other entity that is registered by SAG for the purpose of the export of Chilean table grapes to Australia.

All boxes must be labelled with the vineyard registration number and boxes/pallets with the fumigation facility number. Box stamping requirements will only be necessary for consignments consisting of individual boxes that will not be palletised, and not for complete pallets. Procedures will be developed by AQIS to deal with missing box stamps on a case-by-case basis.

Stacking of boxes on pallets must be done in such as way as to facilitate permeation and diffusion of fumigant through the entire pallet. The pallets should be securely strapped only after phytosanitary inspection has been carried out following post-harvest treatment.

Palletised product is to be identified by attaching a uniquely numbered pallet card to each pallet or part pallet to enable trace back to registered vineyards.

Pallet cards must be securely fastened to the pallet in order to withstand handling at the ports of export/import. If pallet cards are not affixed or cannot be located on arrival in Australia the pallet will not be considered pre-cleared. Additionally, any unpalletised boxes that have not been marked with the pallet number will be considered not to be pre-cleared.

6.5 Storage

Packed product and packaging is to be protected from pest contamination during and after packing, and during movement between locations (e.g. packing house to cool storage/depot, to fumigation facility, to inspection point, to export point).

Product for export to Australia that has been inspected and certified by SAG must be maintained in secure conditions that will prevent mixing with fruit for export to other destinations.

Product that has been pre-cleared by AQIS must be maintained in secure conditions segregated from rejected lots, non-inspected table grapes and other fruit.

The product must be segregated in such a way as to ensure that product is not mixed with fruit for export to other destinations or is not reinfested. Segregation of 1 metre in all directions under ambient temperature storage conditions or a minimum of 100 mm in all directions in a cool storage environment is currently accepted for the import of table grapes into Australia from California.

Security of the consignment is to be maintained until release from quarantine in Australia.

6.6 Pre-shipment fumigation with SO_2/CO_2

All export shipments must undergo mandatory pre-shipment fumigation with a mixture of sulphur dioxide and carbon dioxide (SO_2/CO_2). The palletised table grapes must be treated with a mixture of 1% sulphur dioxide and 6% carbon dioxide for a minimum of 30 minutes.

All packaging material shall be subjected to SO_2/CO_2 fumigation under the same conditions prescribed for export table grapes and subjected to post fumigation security measures necessary to prevent infestation with spiders of concern or subject to such security measures necessary to prevent infestation with spiders of concern from the time of manufacture until the time of export.

SAG is to supervise the SO_2/CO_2 fumigation treatments. AQIS may direct SAG to suspend a fumigation facility should live spiders of concern be detected during inspections. The suspended facility may be reinstated following favourable results of an investigation conducted by SAG/AQIS.

6.7 Fumigation with Methyl Bromide

All export shipments must undergo mandatory fumigation with methyl bromide in accordance with, or equivalent to, the relevant AQIS standards. The fumigation may be conducted either pre-export in Chile or on-arrival in Australia.

Fumigation on-arrival must occur at the first port of call. No land bridging of consignments will be permitted unless the goods have cleared quarantine. For on-arrival treatments, the shipments are not released by AQIS until after the successful completion of the treatment.

Fumigation with methyl bromide must be carried out for a duration of 2 hours according to the specifications below:

- 32g/m^3 at a grape pulp temperature of 21ºC or greater;
- 40g/m^3 at a grape pulp temperature of 16ºC or greater but less than 21ºC;
- 48g/m^3 at a grape pulp temperature of 10ºC or greater but less than 16ºC.

The loading ratio should not exceed 80% of the chamber volume. Fruit is not to be fumigated if the grape pulp temperature is less than 10ºC. An AQIS-supervised fumigation treatment in Australia will typically not require a follow up inspection.

An AQIS inspector will monitor all fumigation treatments in Australia and in Chile where pre-export fumigation is conducted. AQIS may direct SAG to suspend a fumigation facility should live quarantine pests be detected during inspection of consignments that have been fumigated with methyl bromide. The suspended facility may be reinstated following favourable results of an investigation conducted by SAG/AQIS.

Fumigation facilities will ensure that they have systems in place that will assure that treated and untreated product is identified and segregated at all times while at the facility.

6.8 Pre-export Inspection and Remedial Action

SAG will inspect all consignments in accordance with AQIS procedures for all visually detectable quarantine pests and other regulated articles[9] (e.g. trash). The AQIS sampling protocol requires inspection of 600 units (grapes bunches) for quarantine pests, in systematically selected random samples per homogeneous consignment[10] or lot[11]. Biometrically, if no pests are detected by the inspection, this sample size achieves a confidence level of 95% that not more than 0.5% of the units in the consignment are infested/infected. The level of confidence depends on each fruit in the consignment having about the same likelihood of being affected by a quarantine pest and the inspection technique being able to reliably detect all quarantine pests in the sample. For table grapes, AQIS defines a unit as one table grapes bunch.

9 The IPPC defines regulated article as “any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved”.

10 A consignment is the number of boxes of table grapes for shipment from Chile to Australia covered by one phytosanitary certificate.

11 An inspection lot is the number of boxes presented for a single phytosanitary inspection.

The detection of live quarantine pests or regulated articles during an inspection will result in the failure of the inspection lot. Remedial action may then be taken. Action may include:

- withdrawing the consignment from export to Australia; or
- treatment of the consignment and re-inspection to ensure that the pest is no longer viable.

The export program to Australia will be suspended if any live Mediterranean fruit flies are detected in the consignments, until Biosecurity Australia and SAG are satisfied that appropriate corrective action has been taken.

Records of the interceptions made during these inspections (live quarantine pests and regulated articles) must be maintained by SAG and made available to Biosecurity Australia as requested. This information will assist in future reviews of this import pathway and consideration of the appropriateness of the phytosanitary measures that have been applied.

6.9 Phytosanitary Certification

SAG will issue an International Phytosanitary Certificate (IPC) for each consignment upon completion of pre-export fumigation treatment(s) and phytosanitary inspection, containing the following information:

Additional declarations

- Additional declaration stating, *"The grapes in this consignment have been produced in Chile in accordance with the conditions governing entry of fresh table grapes to Australia and inspected and found free of quarantine pests"*.

If pre-clearance has been undertaken

- *"AQIS pre-clearance inspection undertaken in Chile in accordance with the Work Plan For The Pre-clearance of Chilean Table Grapes to Australia <insert date>"*

Note: The Work Plan will be developed between AQIS and SAG following the finalisation of this IRA.

Distinguishing marks

- The pallet card numbers, container numbers, aircraft flight number (where known) and seal numbers (for sea freight).

Treatments

- Details of pre-export fumigation treatments conducted (dosage, duration, grape pulp temperature, date).
- The fumigation facility number (for the SO_2/CO_2 treatment facility and the methyl bromide fumigation facility).

6.10 Pre-clearance Phytosanitary Inspection

AQIS will inspect all consignments in accordance with the official procedures for all visually detectable quarantine pests and regulated articles (e.g. trash). Sample rates must achieve a 95% confidence level that not more than 0.5% of the units (grape bunches) in the consignment are infested. This equates to a level of zero units infested by quarantine pests in a random sample size of 600 units from the homogenous lots in the consignment. The

600-unit sample must be selected randomly from every lot in the consignment. The detection of live quarantine pests and regulated articles (including pest plants and trash) will result in the failure of a consignment.

Records of the interceptions made during these inspections (live or dead arthropod pests, pest plant seeds and trash) are to be maintained. This information will assist in future reviews of this import pathway and consideration of the appropriateness of the phytosanitary measures.

For consignments that are to undergo pre-export SO_2/CO_2 and methyl bromide treatments, the inspection is to be conducted after both treatments have been conducted.

For consignments that are to undergo pre-export SO_2/CO_2 treatment and on-arrival methyl bromide fumigation, the inspection is to be conducted after the SO_2/CO_2 fumigation treatment has been conducted.

Participants are to remove pallets/packages from cool-stores as directed by AQIS. This will be on a random basis so all pallets in the lot must be in the one place and accessible at the time of inspection. AQIS will undertake pre-clearance inspection of lots submitted by participants. Participants are to reassemble pallets immediately after completion of pre-clearance inspection. For the purposes of pre-clearance inspections, fumigation lots conducted within a 36-hour period may be combined into one inspection lot if consistent treatment procedures are followed from the same treatment facility.

Sufficient cartons/boxes will be selected at random from the nominated lot to ensure a 600-bunch inspection can be completed. The number of cartons/boxes inspected to obtain the 600 bunches will be recorded.

Inspection will require that each bunch be individually examined. Limited destructive sampling may be required to break open tight bunches. The full 600 bunches selected for inspection will be completed regardless of whether any detections are found earlier in the inspection.

All fruit will be removed from each selected carton/box and the empty carton/box examined for quarantine pests and regulated articles. The detection of live quarantine pests or regulated articles during an inspection will result in the failure of the inspection lot. Remedial action may then be taken. Action may include:

- withdrawing the consignment from export to Australia; or
- treatment of the consignment and re-inspection to ensure that the pest is no longer viable.

Lots that fail inspection must be clearly identified with a label indicating that the lot is rejected for export to Australia. Rejected product must be segregated from other table grapes that are either awaiting inspection or have passed inspection. Product rejected for Australian quarantine purposes is not eligible for export to Australia.

If product continually fails inspection, AQIS reserves the right to suspend the export program and conduct an audit of the table grape systems that are in place. The program will only continue once AQIS/BA is satisfied that appropriate corrective action has been taken.

6.11 On-arrival Inspection, Remedial Action and Clearance by AQIS

For consignments that have undergone pre-clearance, AQIS will undertake a documentation compliance examination for consignment verification purposes prior to release from quarantine.

On arrival, each consignment will be inspected by AQIS and documentation will be examined for consignment verification purposes at the port of entry in Australia prior to release from quarantine. However, for consignments that undergo on-arrival methyl bromide fumigation, AQIS may, in addition, perform monitoring inspections as appropriate.

The standard AQIS inspection protocol will apply. The sampling methodology provides 95% confidence that there is not more than 0.5% infestation in the consignment. If product continually fails inspection, AQIS reserves the right to suspend the export program and conduct an audit of the Chilean table grape risk management systems. The program will continue only once Biosecurity Australia/AQIS is satisfied that appropriate corrective action has been taken.

6.11.1 Remedial action

If live quarantine pests or regulated articles are found during an inspection, the importer will be given the option to treat (if a suitable treatment is available), re-export or destroy the consignment.

6.11.2 Documentation errors

Any 'consignment' with incomplete documentation, or where certification does not conform to specifications, or seals on the containers are damaged or missing, will be held pending clarification by SAG and determination by AQIS, with the options of re-export or destruction. SAG will be notified immediately by AQIS of any such problems.

6.12 Western Australia

State legislation in Western Australia currently prohibits the importation of fresh table grapes from areas where downy mildew occurs, including other Australian States and Territories. Biosecurity Australia considers that the risk management measures proposed in this IRA report appropriately manage the risks associated with the importation of table grapes from Chile into all States and Territories of Australia. However, the Western Australian State legislation requires modification before imports into that State can occur.

6.13 Review of Policy

This policy will be reviewed at the end of the first year of export of table grapes from Chile to Australia and in the event of new outbreaks in Chile of pests of concern to Australia.

7 CONCLUSIONS

The findings of this revised draft IRA report are based on a comprehensive analysis of relevant scientific literature and existing import requirements for table grapes into Australia.

Biosecurity Australia considers that the proposed risk management measures and proposed import conditions in this revised draft IRA report will provide an appropriate level of protection against the pests identified in the risk assessment.

In the course of preparing the revised draft IRA report, Biosecurity Australia received and considered submissions on scientific issues raised in the draft IRA report. A synopsis of submissions received in response to the draft IRA report and Biosecurity Australia's response is included in this revised draft IRA report. Biosecurity Australia has considered all scientific issues raised in the submissions of stakeholders and incorporated the comments and suggestions as appropriate.

8 FURTHER STEPS IN THE IMPORT RISK ANALYSIS PROCESS[12]

The IRA process requires that the following steps be followed for the implementation of import policy:

- A comment period for all stakeholders following the release of the revised draft IRA report;
- Consideration and incorporation of stakeholder comments, where appropriate, into the final IRA report;
- Presentation of the final IRA report to the Eminent Scientist's Group (ESG) and Biosecurity Australia's Principle Scientist for consideration;
- ESG report on the final IRA report forwarded to the Biosecurity Australia Principle Scientist;
- Incorporation of ESG and Principle Scientist recommendations into the final IRA report, where appropriate;
- Final IRA report, ESG report and Principle Scientist report forwarded to the Secretary for consideration;
- If no further changes required by the Secretary, release of the final IRA report;
- A thirty day appeal period commencing from the release date of the final IRA report (appeals will be considered if there was a significant deviation from the process as set out in the IRA Handbook or a significant body of scientific evidence relevant to the outcome of the IRA was not considered);
- Consideration of any appeals; and
- If no appeals, or if appeals are rejected, adoption of the quarantine policy.

9 SYNOPSIS OF STAKEHOLDER COMMENTS ON THE DRAFT IRA REPORT AND BIOSECURITY AUSTRALIA'S RESPONSE

A synopsis of the stakeholder comments received on the draft IRA report and the response from Biosecurity Australia is given below. All stakeholder comments received on the draft IRA report and Biosecurity Australia's response to these comments have been placed on the Public File for this IRA, with the exception of comments from the Department of Agriculture Western Australia who have requested that their comments remain confidential.

<u>Stakeholder comment:</u> Regional differences in pest status (i.e. presence/absence) should be taken into consideration in the risk assessment.

Biosecurity Australia agrees that technically justified regional freedoms should be taken into account during the IRA process. Numerous revisions have been made to the status of

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[12] The process described here is the new process as outlined in Biosecurity Australia's *Import Risk Analysis Handbook* 2003.

pests in the pest categorisation stage of this IRA following stakeholder submissions on regional quarantine issues. Where appropriate, this has resulted in some pests being considered further in the risk assessment process and risk management measures being proposed for them.

Stakeholder comment: If inspection lots are not homologous, AQIS sampling rates to achieve 95% confidence level that not more than 0.5% of the bunches in the consignment are infested may not be achieved.

AQIS uses the single stage 600 unit sampling methodology to achieve a 95% confidence level that no more than 0.5% of the units in the consignment are infested. The advantages and disadvantages of this sampling methodology are outlined in Cannon (1998). AQIS considers current sampling methodology appropriate to maintain Australia's phytosanitary status.

Stakeholder comment: Is the absolute number of pests in a consignment relevant to the level of risk posed by pests on the pathway? If so, should sample size be proportional to the consignment size?

The likelihood of importation of pests in a consignment is related to the number of pests in the consignment but likelihood of importation is only one factor in the entry, establishment or spread of pests. AQIS inspects 600 units for consignments larger than 1000 units to achieve a 95% confidence level that no more than 0.5% of the units in the consignment are infested. To achieve an equivalent confidence level for smaller consignments, AQIS inspects 450 units for consignments of 1000 units or less and all the units for consignments of 450 units or less. These inspection levels provide a high level of confidence that quarantine pests will be detected and actioned in a consignment.

Stakeholder comment: The provision of more detailed pest data sheets would enhance transparency and stakeholder confidence in the risk assessments.

Biosecurity Australia considers that the presentation of datasheets containing accurate information relevant to the risk assessment is appropriate. Every attempt is made to ensure all relevant information available at the time of publication of this document is included in pest data sheets. Biosecurity Australia would appreciate advice from stakeholders aware of additional information in order for it to be considered in the final IRA report.

Stakeholder comment: How does Biosecurity Australia resolve apparent contradictions that may occasionally arise, between scientific literature and assertions from the NPPO on the status of a pest within the country being considered?

Biosecurity Australia makes every effort to verify the accuracy of pest records. Often references may be dated and or additional work has not been published. Close liaison with the NPPO and researchers associated with the area of interest will often resolve these issues.

Stakeholder comment: Risk management measures for various pests determined to be on the pathway and above Australia's ALOP for imported product would have to be adopted at the State level for domestic interstate trade.

Article 6 of the WTO SPS Agreement covers Australia's obligations on the 'Adaptation of Regional Conditions'. Article 6 requires that "Members shall ensure that their sanitary or phytosanitary measures are adapted to the sanitary or phytosanitary characteristics of the area — whether all of a country, part of a country, or all or parts of several countries —

from which the product originated and to which the product is destined" and "Implementation of any risk management measures for pests of quarantine concern, at the state level, must be supported by a pest risk assessment. Adoption of risk management measures for international imports does not preclude the adoption of equivalent risk management measures at the state level, if appropriate".

Stakeholder comment: Interception data, for current export destinations for Chile table grapes, should be considered for each pest.

Biosecurity Australia has considered interception data for pests of quarantine concern, where available.

Stakeholder comment: What is the process for determining the quarantine status of previously uncategorised pests that may be associated with table grape imports?

If an organism is detected on table grapes from Chile that has not been categorised, it will require assessment by Biosecurity Australia to determine its quarantine status and if phytosanitary action is required. The detection of any pests of quarantine concern not already identified in the analysis may result in the suspension of trade while a review is conducted to ensure that the existing measures continue to provide the appropriate level of phytosanitary protection for Australia.

Stakeholder comment: Is SO_2/CO_2 considered an efficacious treatment against spiders?

Biosecurity Australia considers mandatory SO_2/CO_2 treatment combined with mandatory methyl bromide fumigation and visual inspection will significantly reduce the risk of live spiders being associated with the consignments. No live spiders have been found during pre-clearance inspections in California during the last three seasons of exports of table grapes to Australia following SO_2/CO_2 treatment and methyl bromide fumigation.

Stakeholder comment: The biology of mites is sufficiently different to be assessed at a taxonomic level below the current subclass of Acari.

After consideration of additional information provided by stakeholders, Biosecurity Australia agrees with this statement for this IRA. The mite species under consideration in this IRA have been divided into spider mites [Acari: Tetranychidae] and *Brevipalpus chilensis* Baker [Acari: Tenuipalpidae].

Stakeholder comment: The biology of mealybugs and scales is sufficiently different to be assessed separately.

After consideration of additional information provided by stakeholders, Biosecurity Australia agrees with this statement for this IRA. Mealybugs and scales under consideration in this IRA have been divided into separate groups.

Stakeholder comment: Regional freedoms for plant pathogens were not considered.

Regional freedoms were considered. The initial determination was that there were no pathogens of regional concern. However, reconsideration of the data following stakeholder submissions has led to the inclusion of additional plant pathogens for assessment as regional quarantine pests.

<u>Stakeholder comment</u>: Various weed species have/have not been considered within this IRA.

Biosecurity Australia has considered stakeholder submissions associated with the plant pest risk assessment process. As a result, plant pests were categorised to ensure consideration of all of the relevant State and Commonwealth legislation associated with plant pest management in Australia.

<u>Stakeholder comment</u>: Is visual inspection considered adequate for the detection of aphids, mealybugs, scales and thrips?

AQIS inspection reliably detects aphids, mealybugs, scales and thrips on various commodities from various sources. Visual inspection associated with mandatory fumigation with methyl bromide for *Brevipalpus chilensis* will maintain Australia's phytosanitary status.

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