Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Importation of grapes (*Vitis vinifera*) for consumption from Chile into the United States and territories

A Qualitative, Pathway Initiated Pest Risk Assessment

Version 2

10/19/2021

Agency contact
Plant Pest Risk Analysis (PPRA)
Science and Technology (ST)
Plant Protection and Quarantine (PPQ)
Animal and Plant Health Inspection Service (APHIS)
United States Department of Agriculture (USDA)
920 Main Campus Drive, Suite 400
Raleigh, NC 27606

Executive Summary

The purpose of this report is to assess the pest risks associated with importing commercially produced grape clusters, *Vitis vinifera* (Vitaceae), from Chile into the United States and territories for consumption.

While Chile already has market access for grapes, this PRA was requested by PPQ to determine the current pests that would be associated with the pathway as candidates for mitigation in support of developing a systems approach that does not include methyl bromide as a treatment. In preparing this PRA, we did not consider any washing or pest mitigations during the pathway. The pest risk ratings depend on the application of all conditions of the pathway as described in this document. Grape clusters produced under different conditions were not evaluated and may pose a different pest risk.

We used scientific literature, port-of-entry pest interception data, and information from the government of Chile to develop a list of pests with quarantine significance for the entire United States and territories. These are pests that occur in Chile on any host and are associated with the commodity plant species anywhere in the world.

The following organisms are candidates for pest risk management because they have met the threshold for unacceptable consequences of introduction.

Pest type	Taxonomy	Scientific name	Likelihood of Introduction
Arthropod	Trombidiformes: Tenuipalpidae	*Brevipalpus chilensis* Baker	Medium
	Hemiptera: Pseudococcidae	*Pseudococcus cribata* González	Low
		Pseudococcus meridionalis Prado	Low
	Lepidoptera: Noctuidae	*Copitarsia decolora* (Guenée)	Low
	Lepidoptera: Tortricidae	*Accuminulia buscki* Brown	Low
		Bonagota salubricola (Meyrick)	Low
		Chileulia stalactitis (Meyrick)	Low
		Lobesia botrana Denis & Schiffermüller	Medium
		Proeulia auraria (Clarke)	Low
		Proeulia chrysopteris (Butler)	Low
		Proeulia triquetra Obraztsov	Low

Detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed separately from this document.

Table of Contents

1. Introduction

1.1. Background

The purpose of this report is to assess the pest risk associated with the importation of commercially produced fresh clusters of grape fruits attached to the rachis (woody stems) (*Vitis vinifera* L.) for consumption from Chile (referred to as the export area) into the United States and territories[1] (referred to as the pest risk analysis or PRA area).

This is a qualitative risk assessment. The likelihood of pest introduction is expressed as a qualitative rating rather than in numerical terms. This methodology is consistent with guidelines provided by the International Plant Protection Convention (IPPC) in the International Standard for Phytosanitary Measures (ISPM) No. 11, "Pest Risk Analysis for Quarantine Pests" (IPPC, 2017a). The use of biological and phytosanitary terms is consistent with ISPM No. 5, "Glossary of Phytosanitary Terms" (IPPC, 2019).

As defined in ISPM No. 11, this document comprises Stage 1 (Initiation) and Stage 2 (Risk Assessment) of risk analysis. Stage 3 (Risk Management) will be covered in a separate document.

1.2. Initiating event

The importation of fruits and vegetables for consumption into the United States is regulated under Title 7, Part 319.56-3 of the Code of Federal Regulations (7 CFR §319.56-3, 2019) (PPQ, 2020). Under this regulation, the entry of grape clusters from Chile into the PRA area is authorized with a Condition of Entry Treatment: T101-h-2 (Methyl Bromide fumigation) in addition to any required *Ceratitis capitata* treatments (FAVIR, 2021). This commodity risk assessment was initiated in response to an internal request by PPQ to determine the current pest risk from grapes from Chile, which will be used to consider updating the fruits and vegetables import requirements to a new systems approach to allow entry of grapes without the use of methyl bromide fumigation.

1.3. Potential weediness of the commodity

In some cases, an imported commodity could become invasive in the PRA area. If warranted, we analyze the commodity for weed risk. A weed risk analysis is not required when (a) the commodity is already enterable into the PRA area from other countries, (b) the commodity plant species is widely established (native) or cultivated in the PRA area, or (c) the imported plant part(s) cannot easily propagate on its own or be propagated.

The weed risk of grapes does not need to be analyzed because it is already enterable from other countries, including Chile (FAVIR, 2021).

1.4. Description of the pathway

A pathway is "any means that allows the entry or spread of a pest" (IPPC, 2019). In the context of this document, the pathway is the commodity to be imported, together with all the processes

[1]The PRA area includes all 50 states, Guam, the Commonwealth of the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands.

the commodity undergoes from production through importation and distribution. The following description of this pathway focuses on the conditions and processes that may have an impact on pest risk. Our assessment is therefore contingent on the application of all components of the pathway as described in this section.

1.4.1. Description of the commodity

The specific pathway of concern is the importation of fresh clusters of grapes, which is the fruit attached to the rachis (woody stems). The intended use of the commodity is for consumption.

1.4.2. Summary of the production, harvest, post-harvest, shipping, and storage conditions considered

We are considering commercially produced, grape clusters (fruit and rachis), which are harvested from the vine. We are not considering any production, harvesting, and post-harvesting procedures in the exporting area. Shipping and storage conditions have not been specified.

2. Pest List and Pest Categorization

The pest list is a compilation of plant pests of quarantine significance to the United States and territories. This list includes pests that are present in Chile on any host and known to be associated with *Vitis vinifera* anywhere in the world. Pests are considered to be of quarantine significance if they (a) are not present in the PRA area, (b) are actionable at U.S. ports of entry, (c) are regulated non-quarantine pests, (d) are under Federal official control, or (e) require evaluation for regulatory action. Consistent with ISPM No. 5, pests that meet any of these definitions are considered "quarantine pests" and are candidates for analysis. Species with a reasonable likelihood of following the pathway into the PRA area are analyzed to determine their pest risk potential.

2.1. Pest list

We developed the pest list based on the scientific literature, port-of-entry pest interception data, and information provided by the government of Chile. We listed the pests that are of quarantine significance to the PRA area under Table 1. For each pest, we provided evidence of the pest's presence in Chile and its association with *Vitis vinifera*. We also indicated the plant parts with which the pest is generally associated and provided information about the pest's distribution in the United States, if any. Pests that are likely to remain associated with the harvested commodity in a viable form are indicated by shaded rows and are listed separately in Table 2.

Table 1. List of quarantine pests associated with *Vitis vinifera* (in any country) and present in Chile (on any host).

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)** [2]	**Considered further?**[3]
Arthropoda: Arachnida				
Trombidiformes: Eriophyidae				
Colomerus vitis (Pagenstecher)	González et al., 1973; Klein Koch and Waterhouse, 2000	González et al., 1973; Klein Koch and Waterhouse, 2000	Leaves, buds, shoots (Cooper et al., 2020; Walton et al., 2007)	No Present in California (Cooper et al., 2020) and Oregon (Walton et al., 2007)
Trombidiformes: Tenuipalpidae				
Brevipalpus chilensis Baker	Klein Koch and Waterhouse, 2000; SAG, 2021a	Curkovic et al., 2013; SAG, 2021a	Fruit (Castro et al., 2004), Leaves (Curkovic et al., 2013)	Yes
Trombidiformes: Tetranychidae				
Oligonychus mangiferus (Rahman & Sapra)	Bolland et al., 1998; Migeon and Dorkeld, 2021	Bolland et al., 1998; Migeon and Dorkeld, 2021	Leaves (Hill, 1983)	No Present in Hawaii (Migeon and Dorkeld, 2021)
Oligonychus vitis Zaher & Shehata	Bolland et al., 1998; Migeon and Dorkeld, 2021; SAG, 2021a	Bolland et al., 1998; Migeon and Dorkeld, 2021; SAG, 2021a	Leaves (Hill, 1983; SAG, 2021a)	No
Arthropoda: Insecta				
Coleoptera: Bostrichidae				
Dexicrates robustus (Blanchard)	Klein Koch and Waterhouse, 2000; González et al., 1973; Barriga et al., 1993	Barriga et al., 1993; Klein Koch and Waterhouse, 2000	Wood (Klein Koch and Waterhouse, 2000)	No

[2] The plant part(s) listed are those for the plant species under analysis. If the information has been extrapolated, such as from plant part association on other plant species, we note that.

[3] "Yes" indicates simply that the pest has a reasonable likelihood of being associated with the harvested commodity; the level of pest prevalence on the harvested commodity (low, medium, or high) is qualitatively assessed as part of the Likelihood of Introduction assessment (section 3).

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Micrapate humeralis (Blanchard)	Klein Koch and Waterhouse, 2000; Prado, 1991	Klein Koch and Waterhouse, 2000; Prado, 1991	Wood (Barriga et al., 1993; Klein Koch and Waterhouse, 2000)	No
Micrapate scabrata (Erichson)	Curkovic et al., 2018; Barriga et al., 1993; González et al., 1973; Klein Koch and Waterhouse, 2000	Curkovic et al., 2018; Barriga et al., 1993; González et al., 1973; Klein Koch and Waterhouse, 2000	Wood (Curkovic et al., 2018; Klein Koch and Waterhouse, 2000)	No
Coleoptera: Cerambycidae				
Eryphus laetus (Blanchard); syn. *Callideriphus laetus* Blanchard	Barriga et al., 1993; Klein Koch and Waterhouse, 2000; Prado, 1991	Barriga et al., 1993; Klein Koch and Waterhouse, 2000; Prado, 1991	Wood (Barriga et al., 1993; Ciesla, 2000)	No
Coleoptera: Chrysomelidae				
Chelymorpha varians (Blanchard)	Pizarro and Araya, 2004; González et al., 1973; Barriga et al., 1993	González et al., 1973	Leaves (UGA, 2018; SAG, 2021e)	No
Glyptoscelis pulvinosus (Blanchard); syn. *Dyctineis pulvinosus* (Blanch.) (González, 1983)	Elgueta et al., 2017; González, 1983	González, 1983	Leaves (Elgueta et al., 2017; González, 1983)	No
Lema bilineata Germar; syn. *Oulema bilineata* (Germ.)	Hill, 1987; Monti et al., 2020	Monti et al., 2020	Leaves (Hill, 1987; Monti et al., 2020)	No
Coleoptera: Curculionidae				
Geniocremnus chilensis (Boheman)	González et al., 1973; Klein Koch and Waterhouse, 2000; Morrone, 1999; SAG, 2021a	González et al., 1973; Klein Koch and Waterhouse, 2000; SAG, 2021a	Roots, foliage (SAG, 2021a)	No

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Naupactus ruizi (Brèthes); syn. *Pantomorus ruizi* (Brèthes)	Klein Koch and Waterhouse, 2000; Morrone, 1999; Prado, 1991	Klein Koch and Waterhouse, 2000; Prado, 1991	Roots, leaves ([based on congeners] Baker, 2019)	No
Naupactus xanthographus (Germar)	González et al., 1973; Klein Koch and Waterhouse, 2000; Pizarro-Araya et al., 2009	González et al., 1973; Klein Koch and Waterhouse, 2000; Pizarro-Araya et al., 2009	Foliage, roots (Pizarro-Araya et al., 2009)	No Adult fruit tree weevils are polyphagous and may attack many parts of the plant (CABI, 2021), but they are conspicuous and would not follow the pathway. Larvae live in the soil and feed on roots (CABI, 2021).
Platyapistes glaucus F.	González, 1983	González, 1983	Leaves and buds (González, 1983)	No
Platyapistes venustus Erichson	González, 1983	González, 1983	Leaves and buds (González, 1983)	No
Strangaliodes mutuarius Kuschel	Barriga-Tuñón, 2009; Klein Koch and Waterhouse, 2000; Morrone, 1999	González et al., 1973	Leaves ([based on genus] Pizarro-Araya et al., 2009)	No
Coleoptera: Scarabaeidae				
Athlia rustica Erichson	González, 1983; Klein Koch and Waterhouse, 2000; Smith and Evans, 2018	González, 1983; Klein Koch and Waterhouse, 2000; Smith and Evans, 2018	Leaves, shoots, and buds (González, 1983)	No
Diptera: Tephritidae				
Ceratitis capitata (Wiedemann)	SAG, 2021e	Etienne, 1972; Jediyi et al., 2019	Fruit (Etienne, 1972; Jediyi et al., 2019)	No The Mediterranean fruit fly is present in small numbers in Chile and under eradication (SAG, 2021e).
Hemiptera: Aleyrodidae				

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Bemisia tabaci (Gennadius); syn. *Bemisia argentifolii* Bellows & Perring	Evans, 2008	Summers et al., 1995	Leaves (CABI, 2021)	No
Hemiptera: Aphididae				
Geoica lucifuga (Zehntner)	Blackman and Eastop, 2000	Blackman and Eastop, 2000	Roots (Blackman and Eastop, 2000)	No
Hemiptera: Cicadellidae				
Balclutha aridula Linnavuori	González et al., 1973; Klein Koch and Waterhouse, 2000	González et al., 1973; Klein Koch and Waterhouse, 2000	Phloem sucked from the vine ([based on Cicadellidae in general] Hill, 1987)	No Leafhoppers are highly mobile and would disperse during harvest or processing of grapes (Hill, 1987).
Hemiptera: Cicadidae				
Tettigades chilensis Amyot & Serville	Klein Koch and Waterhouse, 2000	Klein Koch and Waterhouse, 2000	Stems (Quiroga et al., 1991)	No
Hemiptera: Coccidae				
Ceroplastes sinensis Del Guercio	García Morales et al., 2016	Hamon and Mason, 2020	Twigs, petioles, leaves (Hamon and Mason, 2020)	No Action only to Hawaii, Guam, and the U.S. Virgin Islands.
Hemiptera: Coreidae				
Leptoglossus chiliensis Spinola	González et al., 1973; Klein Koch and Waterhouse, 2000	González et al., 1973; Klein Koch and Waterhouse, 2000	Phloem from fruit buds, and fruit juices (Hill, 1987)	No Leaffooted bugs feed externally on fruit (SAG, 2021a). They are conspicuous and would disperse during grape harvest and processing.
Hemiptera: Margarodidae				
Sphaeraspis vitis (Philippi); syn. *Margarodes vitis* (Philippi)	Bournier, 1977; CABI, 2021	Bournier, 1977	Roots (Bournier, 1977)	No

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Hemiptera: Monophlebidae				
Crypticerya palmeri (Riley & Howard); syn. *Icerya palmeri* (Riley & Howard)	Pizarro-Araya et al., 2009	Pizarro-Araya et al., 2009	Foliage (Pizarro-Araya et al., 2009)	No
Icerya purchasi Maskell	García Morales et al., 2016	García Morales et al., 2016	Twigs, leaves and petioles (Avidov and Harpaz, 1969; Hamon and Fasulo, 2020)	No The cottony cushion scale rarely attaches to fruit (Hamon and Fasulo, 2020); regardless, it is conspicuous and immobile. Fruit for consumption is a dead-end pathway. Present in CONUS (García Morales et al., 2016; Hamon and Fasulo, 2020), Hawaii (Heu, 2007), and Puerto Rico (García Morales et al., 2016).
Hemiptera: Pentatomidae				
Acledra fraterna Stål	González et al., 1973; Rider, 2007; SAG, 2021b	González et al., 1973; SAG, 2021b	Fruit, vines (SAG, 2021b)	No This stinkbug is a conspicuous and mobile external feeder (SAG, 2021b); it would disperse during grape harvest and processing
Hemiptera: Pseudococcidae				
Pseudococcus cribata González	Correa et al., 2012; García Morales et al., 2016; Morandi, 2015; SAG, 2021c	Correa et al., 2012; García Morales et al., 2016; Morandi, 2015; SAG, 2021c	Vines, flowers, and fruit (SAG, 2021c; Zaviezo et al., 2015)	Yes
Pseudococcus meridionalis Prado; syn. *Pseudococcus rubigena* González (González and Prado, 2012)	Correa et al., 2012; Morandi, 2015	Correa et al., 2012; Morandi, 2015	Leaves and fruit (Zaviezo et al., 2015)	Yes

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Hemiptera: Rhizoecidae				
Geococcus coffeae Green	García Morales et al., 2016	García Morales et al., 2016	Roots (Capinera, 2008)	No Present in Hawaii, Puerto Rico, U.S. Virgin Islands, and Florida (Capinera, 2008).
Rhizoecus falcifer Kunckel d'Herculais	García Morales et al., 2016	Bournier, 1977; García Morales et al., 2016	Roots (Bournier, 1977)	No
Hymenoptera: Vespidae				
Polistes buyssoni Brèthes	González, 1983; Klein Koch and Waterhouse, 2000	Lowery, 2020; González, 1983	Fruits, flowers (González, 1983)	No Wasps are eusocial insects; individuals able to start a new colony will not follow the pathway.
Lepidoptera: Arctiidae				
Laora variabilis Philippi	González, 1983	González, 1983	Leaves (González, 1983)	No
Paracles rudis Butler	Klein Koch and Waterhouse, 2000	Klein Koch and Waterhouse, 2000	Leaves ([based on congeners] NHM, 2021)	No
Lepidoptera: Noctuidae				
Copitarsia decolora (Guenée); syn. *Copitarsia turbata* (Herrich-Schäffer)	González et al., 1973; Klein Koch and Waterhouse, 2000; Prado, 1991; SAG, 2021a; Simmons and Pogue, 2004	González et al., 1973; Klein Koch and Waterhouse, 2000; Prado, 1991; SAG, 2021a	Leaves, stems (Venette and Gould, 2006), shoots (SAG, 2021a), and fruits (SAG, 2021a; Venette and Gould, 2006)	Yes See notes in section 2.2.
Lepidoptera: Sphingidae				
Hyles annei (Guérin-Méneville)	Klein Koch and Waterhouse, 2000; Vargas and Hundsdoerfer, 2019	Klein Koch and Waterhouse, 2000; Vargas and Hundsdoerfer, 2019	Leaves ([extrapolated from other host plants] Vargas and Hundsdoerfer, 2019)	No

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Hyles euphorbiarum (Guérin-Méneville & Percheron)	Klein Koch and Waterhouse, 2000	Klein Koch and Waterhouse, 2000	Leaves ([extrapolated from other host plants] NHM, 2021)	No
Lepidoptera: Tortricidae				
Accuminulia buscki Brown	Brown, 1999; SAG, 2021a	Brown, 1999; SAG, 2021a	Fruit (Brown, 1999)	Yes
Bonagota salubricola (Meyrick); syn. *Bonagota cranaodes* (Meyrick) (Cordo et al., 2004)	Brown and Passoa, 1998	Bentancourt et al., 2004; Brown and Passoa, 1998	Fruit and leaves (Bentancourt et al., 2004)	Yes
Chileulia stalactitis (Meyrick)	Brown and Passoa, 1998; Klein Koch and Waterhouse, 2000; Prado, 1991; SAG, 2021a	Klein Koch and Waterhouse, 2000; Prado, 1991; SAG, 2021a	Fruit (Brown and Passoa, 1998; SAG, 2021a), Leaves (Brown and Passoa, 1998)	Yes
Lobesia botrana Denis & Schiffermüller	SAG, 2021a; Simmons et al., 2021	Fermaud and Le Menn, 1989; Vassiliou, 2011	Grape clusters (Fermaud and Le Menn, 1989), flowers, fruit (NHM, 2021; Vassiliou, 2011)	Yes
Proeulia apospasta Obraztov; syn. *Proeulia apostata* Obraztov (González, 1983)	Gilligan and Epstein 2014; SAG, 2021a; Simmons et al., 2021	Gilligan and Epstein 2014; Fermaud and Le Menn, 1989; Vassiliou, 2011	Leaves (González, 1983)	No
Proeulia auraria (Clarke)	Brown and Passoa, 1998; Campos et al., 1981; SAG, 2021a	Brown and Passoa, 1998; Campos et al., 1981; González, 1983; SAG, 2021a	Fruit and leaves (Brown and Passoa, 1998; Capinera, 2008; González, 1983)	Yes

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Proeulia chrysopteris (Butler)	Brown and Passoa, 1998; Gilligan and Epstein 2014; SAG, 2021e	(“*Vitis* L. Grape” [Gilligan and Epstein 2014]); Klein Koch and Waterhouse, 2000; CABI, 2021	Fruit and leaves (CABI, 2021)	Yes
Proeulia triquetra Obraztsov	Brown and Passoa, 1998; González, 1989; SAG, 2021e	Brown and Passoa, 1998; González, 1989; SAG, 2021e	Fruit (González, 1983)	Yes
Orthoptera: Acrididae				
Dichroplus maculipennis (Blanchard)	González et al., 1973; Klein Koch and Waterhouse, 2000	González et al., 1973	Foliage (Capinera, 2008)	No Grasshoppers are conspicuous and highly mobile (Capinera, 2008); they would quickly disperse during harvest or processing of grapes.
Schistocerca cancellata (Serville)	González, 1983; Pizarro-Araya et al., 2009	González, 1983	Foliage and sprouting vines (Capinera, 2008; González, 1983)	No Grasshoppers are conspicuous and highly mobile (Capinera, 2008); they would quickly disperse during harvest or processing of grapes.
Orthoptera: Gryllidae				
Gryllus fulvipennis Blanchard; syn. *Achaeta fulvipennis*	Fermín M. Alfaro et al., 2013; Mani et al., 2014	Mani et al., 2014	Leaves, fruit, organic detritus ([based on *Gryllus* in general] Walker and Masaki, 1989)	No Crickets are conspicuous and highly mobile (Walker and Masaki, 1989); they would quickly disperse during harvest or processing of grapes.

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Microgryllus pallipes (Philippi)	González, 1983;	González, 1983	Leaves, fruit, organic detritus (González, 1983)	No Crickets are conspicuous and highly mobile (Walker and Masaki, 1989). They would quickly disperse during harvest or processing of grapes.
Thysanoptera: Thripidae				
Frankliniella australis Morgan; syn. *Frankliniella cestrum* (Moulton)	Klein Koch and Waterhouse, 2000; Manosalva et al., 2011	Klein Koch and Waterhouse, 2000	Flowers and leaves (Manosalva et al., 2011)	No
Mollusca: Gastropoda				
Stylommatophora: Helicidae				
Cornu aspersum (O. F. Müller); syn. *Helix aspersum* (O. F. Müller)	González et al., 1973; Prado, 1991	González et al., 1973; Prado, 1991	Fruit, leaves, flower buds, flowers ([extrapolated from other plant species] CABI, 2021)	No See notes in section 2.2.
BACTERIA				
Candidatus Phytoplasma solani Quaglino et al.	Gajardo et al., 2009	Atanasova et al., 2015	Systemic (Gajardo et al., 2009)	No Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014). In addition, in affected grapevines, berries whither and dry up, which makes it highly unlikely that they will be harvested and exported.
Rhizobium vitis (Ophel & Kerr 1990) Young et al. (Syn. *Agrobacterium vitis* Ophel & Kerr)	Cruz A, 2004	Cruz A, 2004	Trunk, crown (Cruz A, 2004)	No Present in continental United States (UGA, 2019a).
FUNGI				

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Alternaria arborescens E.G. Simmons	Elfar et al., 2018	Casieri et al., 2009	Leaf (Farr and Rossman, 2021)	No Present in continental United States (Nishikawa and Nakashima, 2019). Genus reportable for pathogenic species (PestID, 2021). Endophyte (González and Tello, 2011).
Alternaria vitis Cavara	Mujica and Vergara, 1945	Mujica and Vergara, 1945	Fruit, leaf (Jayawardena et al., 2018)	No. See note in section 2.2. Genus reportable for pathogenic species (PestID, 2021).
Arambarria cognata (Bres.) Rajchenb. & Pildain	Pildain et al., 2017	Pildain et al., 2017	Trunk, stems (Pildain et al., 2017)	No
Armillaria limonea (G. Stev.) Boesew.	Pildain et al., 2010	Jayawardena et al., 2018	Trunk, root (Jayawardena et al., 2018)	No
Armillaria luteobubalina Watling & Kile	Pildain et al., 2010	Jayawardena et al., 2018	Trunk, root (Jayawardena et al., 2018)	No
Armillaria mellea (Vahl : Fr.) P. Kumm.	Mujica and Vergara, 1945	Jayawardena et al., 2018	Trunk, collar, root (Jayawardena et al., 2018)	No Present in continental United States and Hawaii (USDA ARS, 1960, French et al., 2011).
Armillaria novae-zelandiae (G. Stev.) Herink	Pildain et al., 2010	Jayawardena et al., 2018	Trunk, root (Jayawardena et al., 2018)	No

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Biscogniauxia capnodes (Berk.) Y.M. Ju & J.D. Rogers	Ju et al., 1998	Jayawardena et al., 2018	We did not find specific information regarding the damage this pathogen causes in grape, however, species in the genus *Biscogniauxia* are considered weak pathogens that may cause cankers in the trunks of affected hosts under water stress conditions (Nugent et al., 2005).	No Present in continental United States and Hawaii (Ju et al., 1998, Ju et al., 1998).
Cadophora luteo-olivacea (J.F.H. Beyma) T.C. Harr. & McNew	Auger et al., 2018	Travadon et al., 2015	Wood (Travadon et al., 2015)	No Present in continental United States (Travadon et al., 2015). Genus reportable for pathogenic species (PestID, 2021)
Cadophora malorum (Kidd & Beaumont) W. Gams	Díaz et al., 2016	Maldonado-González et al., 2020	Wood (Travadon et al., 2015)	No Present in continental United States (USDA ARS, 1960). Genus reportable for pathogenic species (PestID, 2021)
Cryptovalsa ampelina (Nitschke) Fuckel	Díaz et al., 2013	Díaz et al., 2013	Trunk (Díaz et al., 2013)	No Present in continental United States (Díaz et al., 2013).

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Dactylonectria macrodidyma (Halleen, Schroers & Crous) L. Lombard & Crous (Syn. *Ilyonectria macrodidyma* (Hallen, Schroers & Crous) P. Chaverri & C. Salgado)	Agusti-Brisach and Armengol, 2013	Agusti-Brisach and Armengol, 2013	Roots, rootstock (Agusti-Brisach and Armengol, 2013)	No Present in continental United States (Petit and Gubler, 2005).
Diaporthe ambigua Nitschke	Díaz and Latorre, 2018	Jayawardena et al., 2018	Trunk, rootstock (Jayawardena et al., 2018)	No Present in continental United States (USDA ARS, 1960). Genus reportable for pathogenic species (PestID, 2021)
Diaporthe ampelina (Berk & M.A. Curtis) R.R. Gomes, C. Glienke & Crous (Syn. *Phomopsis viticola* (Reddick) Goid)	Cruz A, 2004	Lawrence et al., 2015	Trunk, cordon, cane, leaf, rachis (Lawrence et al., 2015)	No. When it affects the green rachis, it weakens it and causes the cluster to break off (Lawrence et al., 2015). Such infected plants would not have fruit to harvest and would not follow the pathway. Present in continental United States (USDA ARS, 1960). Genus reportable for pathogenic species (PestID, 2021)
Diaporthe australafricana Crous & Van Niekerk	Díaz and Latorre, 2018	Jayawardena et al., 2018	Trunk (Lawrence et al., 2015)	No. Might not be pathogenic, they instead might act as endophytes after colonizing grapevine wood (Lawrence et al., 2015). Present in continental United States (Jayawardena et al., 2018). Action required to HI, PR, and the USVI (PestID, 2021).

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Diaporthe foeniculina (Sacc.) Udayanga & Castl. (Syn. *Diaporthe neotheicola* A.J.L. Phillips & J.M. Santos)	Guerrero Contreras et al., 2020	Lawrence et al., 2015	Trunk (Jayawardena et al., 2018)	No. Might not be pathogenic, they instead might act as endophytes after colonizing grapevine wood (Lawrence et al., 2015). Present in continental United States (Lawrence et al., 2015). Genus reportable for pathogenic species (PestID, 2021).
Diaporthe novem J.M. Santos, Vrand. & A.J.L. Phillips	Díaz et al., 2017	Lawrence et al., 2015	Petioles, leaves, wood (Lawrence et al., 2015)	No Present in continental United States (Lawrence et al., 2015). Genus reportable for pathogenic species (PestID, 2021).
Diaporthe perniciosa Marchal & É.J. Marchal	Mujica and Vergara, 1945	Jayawardena et al., 2018	Bark, leaves (Jayawardena et al., 2018)	No Present in continental United States (USDA ARS, 1960). Genus is reportable for pathogenic species (PestID, 2021).
Diplodia mutila (Fr. : Fr.) Mont. (*Botryosphaeria stevensii* Shoemaker)	Díaz et al., 2013	Úrbez-Torres et al., 2006	Trunk (Wilcox et al., 2015)	No Present in continental United States and Hawaii (Úrbez-Torres et al., 2006, Raabe et al., 1981)
Dothiorella iberica A.J.L. Phillips, J. Luque & A. Alves - (*Botryosphaeria iberica* A.J.L. Phillips, J. Luque & A. Alves)	Valencia et al., 2019	Jayawardena et al., 2018	Twigs (Jayawardena et al., 2018)	No Present in continental United States (Jayawardena et al., 2018). Genus reportable for pathogenic species (PestID, 2021).
Dothiorella vidmadera W.M. Pitt, J.R. Úrbez-Torres & Trouillas	Linaldeddu et al., 2016	Linaldeddu et al., 2016	Trunk, branches (Linaldeddu et al., 2016)	No Genus reportable for pathogenic species (PestID, 2021).

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Dothiorella viticola A.J.L. Phillips & J. Luque (Syn. *Spencermartinsia viticola* (A.J.L. Phillips & J. Luque) A.J.L. Phillips, A. Alves & Crous)	Dissanayake et al., 2016	Dissanayake et al., 2016	Trunk, but in some situations can cause berry rot (Wunderlich et al., 2009)	No. See note in section 2.2 Present in continental United States (California (Úrbez-Torres and Gubler, 2009)). Genus reportable for pathogenic species (PestID, 2021).
Fomes fomentarius L. : Fr.	Mujica and Vergara, 1945	Tai, 1979	Trunk (Farr and Rossman, 2021)	No Present in continental United States (USDA ARS, 1960).
Fusarium oxysporum Schltdl. : Fr.	Mujica and Oehrens, 1967	Jayawardena et al., 2018	Trunk, root (Jayawardena et al., 2018)	No Present in continental United States, Hawaii, Puerto Rico, and U.S. Virgin Islands (Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960). Reportable at U.S. ports-of-entry (PestID, 2021).
Neofusicoccum ribis (Slippers, Crous & M.J. Wingf.) Crous, Slippers & A.J.L. Phillips	Mujica and Vergara, 1945	Úrbez-Torres et al., 2012	Trunk (Úrbez-Torres et al., 2012)	No Present in continental United States, Hawaii, and Puerto Rico (Farr and Rossman, 2021; Raabe et al., 1981; USDA ARS, 1960). No action required except when destined to Puerto Rico (PestID, 2021).
Ophiostoma piceae (Münch) Syd. & P. Syd.	Butin and Peredo, 1986	Jayawardena et al., 2018	Wood (Jayawardena et al., 2018)	No Present in continental United States (Shaw, 1973).
Ophiostoma quercus (Georgev.) Nannf.	Taerum et al., 2018	Jayawardena et al., 2018	Trunk (Jayawardena et al., 2018)	No
Peziza ascoboloides Bertero ex Mont	Mujica and Vergara, 1945	Farr and Rossman, 2021	Root, trunk, cordon (Farr and Rossman, 2021)	No
Phaeoacremonium inflatipes W. Gams, Crous & M.J. Wingf.	Spies et al., 2018	Spies et al., 2018	Root, stem (Spies et al., 2018)	No Present in continental United States (Scheck et al., 1998).

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Phaeoacremonium minimum (Tul. & C. Tul.) D. Gramaje, L. Mostert & Crous (Syn. *Phaeoacremonium aleophilum* W. Gams, Crous, M.J. Wingf. & Mugnai)	Díaz et al., 2013	Jayawardena et al., 2018	Root, trunk, cordon (Jayawardena et al., 2018)	No Present in continental United States (Gams and Crous, 2000).
Phaeoacremonium parasiticum (Ajello, Georg & C.J.K. Wang) W. Gams, Crous & M.J. Wingf.	Jayawardena et al., 2018	Dupont et al., 2002	Stem, trunk (Dupont et al., 2002)	No Present in continental United States (Crous et al., 1996).
Phaeoacremonium rubrigenum W. Gams, Crous & M.J. Wingf.	Gramaje et al., 2015	Gramaje et al., 2015	Wood (Gramaje et al., 2015)	No Present in continental United States (Essakhi et al., 2008).
Phaeomoniella chlamydospora (W. Gams, Crous, M.J. Wingf. & Mugnai) Crous & W. Gams (Syn. *Phaeoacremonium chlamydosporum* W. Gams, Crous, M.J. Wingf. & Mugnai)	Auger et al., 2007	Auger et al., 2007	Root, trunk, cordons (Auger et al., 2007)	No Present in continental United States (Scheck et al., 1998).
Phellinus igniarius (L. : Fr.) Quél. (Syn. *Fomes igniarius* (L.) Fr.)	Mujica and Vergara, 1945	Jayawardena et al., 2018	Trunk (Jayawardena et al., 2018)	No Present in continental United States (USDA ARS, 1960).
Phytophthora cambivora (Petri) Buisman	Jung et al., 2018	Jayawardena et al., 2018	Roots, stems, especially base of trunk (Jayawardena et al., 2018).	No Present in continental United States (Erwin and Ribeiro, 1996). Genus is reportable for pathogenic species (PestID, 2021).

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Phytophthora cinnamomi Rands	Jung et al., 2018	Jayawardena et al., 2018	Roots, stems, branches, heartwood (Jayawardena et al., 2018).	No Present in continental United States, Hawaii, Puerto Rico, and U.S. Virgin Islands (USDA ARS, 1960, USDA ARS, 1960,Stevenson, 1975). Genus is reportable for pathogenic species (PestID, 2021).
Phytophthora citricola Sawada	Wilcox and Latorre, 2002	Erwin and Ribeiro, 1996	Root (Erwin and Ribeiro, 1996)	No Present in continental United States and Hawaii (Erwin and Ribeiro, 1996, Erwin and Ribeiro, 1996).
Phytopythium litorale (Nechw.) Abad, de Cock, Bala, Robideau, Lodhi & Lévesque	Guajardo et al., 2019	Farr and Rossman, 2021	Root (Farr and Rossman, 2021)	No Present in continental United States (Alejandro Rojas et al., 2017). Genus is reportable for pathogenic species (PestID, 2021).
Phytopythium vexans (de Bary) Abad, de Cock, Bala, Robideau, Lodhi & Lévesque	Guajardo et al., 2019	Farr and Rossman, 2021	Seedling, root (Farr and Rossman, 2021)	No Present in continental United States and Hawaii (USDA ARS, 1960, Raabe et al., 1981). Genus is reportable for pathogenic species (PestID, 2021).
Rosellinia necatrix Prill. (Syn. *Dematophora necatrix* R. Hartig)	Mujica and Vergara, 1945	Mujica and Vergara, 1945	Roots (Jayawardena et al., 2018)	No Present in continental United States (USDA ARS, 1960). Genus is reportable for pathogenic species (PestID, 2021).
Seimatosporium botan Sat. Hatak. & Y. Harada	Díaz et al., 2013	Díaz et al., 2013	Cordon, trunk (Díaz et al., 2013)	No Present in continental United States (Lynch et al., 2014). Reportable at U.S. ports-of-entry (PestID, 2021).

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Seimatosporium vitifusiforme D.P. Lawr. & Travadon	Grinbergs et al.,	Grinbergs et al.,	Trunk (Grinbergs et al.,)	No Present in continental United States (Lawrence et al., 2018). Reportable at U.S. ports-of-entry (PestID, 2021).
VIRUSES AND VIROIDS				
Alfamovirus Alfalfa mosaic virus	Peña et al., 2011	Martelli, 2014	Systemic (Jaspars and Bos, 1980)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Ampelovirus Grapevine leafroll associated virus 1	Fiore et al., 2008	Fiore et al., 2008	Systemic (Fiore et al., 2008)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Ampelovirus Grapevine leafroll associated virus 3	Fiore et al., 2008	Fiore et al., 2008	Systemic (Martelli et al., 2011)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Closterovirus Grapevine leafroll associated virus 2	Fiore et al., 2008	Fiore et al., 2008	Systemic (Fiore et al., 2008)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Foveavirus Grapevine rupestris stem pitting-associated virus	Fiore et al., 2008	Bouyahia et al., 2005	Systemic (Bouyahia et al., 2005)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (Bouyahia et al., 2005).
Maculavirus Grapevine fleck virus	Fiore et al., 2008	Fiore et al., 2008	Systemic (Fiore et al., 2008)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Nepovirus Arabis mosaic virus	Medina et al., 2006	Martelli, 2014	Systemic (Murant, 1970)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Nepovirus Cherry leaf roll virus	Herrera and Madariaga, 2001	Herrera and Madariaga, 2001	Systemic (Herrera and Madariaga, 2001)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Nepovirus Grapevine fanleaf virus	Fiore et al., 2008	Martelli, 2014; Wilcox et al., 2015	Systemic (Martelli et al., 2001b)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Nepovirus Tobacco ringspot virus	Medina et al., 2006	Martelli, 2014	Systemic (Stace-Smith, 1970)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Nepovirus Tomato ringspot virus	Medina et al., 2006	Martelli, 2014; Wilcox et al., 2015	Systemic (Stace-Smith, 1984)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Pospivirus Hop stunt viroid	Fiore et al., 2016	Hadidi et al., 2017	Systemic (Hadidi et al., 2017)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (EPPO, 2021).
Trichovirus Grapevine Pinot gris virus	Zamorano et al., 2019	Zamorano et al., 2019	Systemic (Al Rwahnih et al., 2016)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (Al Rwahnih et al., 2016).
Unassigned Grapevine leafroll associated virus 7	Fiore et al., 2008	Fiore et al., 2008	Systemic (Fiore et al., 2008)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (Morales and Monis, 2007).

Pest name	**Presence in Chile**	***Vitis vinifera* association**	**Plant part(s)**	**Considered further?**
Unassigned Grapevine leafroll associated virus 9	Engel et al., 2008	Engel et al., 2008	Systemic (Engel et al., 2008)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (Bahder et al., 2013).
Unassigned Raspberry bushy dwarf virus	Medina et al., 2006	Wilcox et al., 2015	Systemic (Wilcox et al., 2015)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Unassigned Grapevine Syrah virus-1	Engel et al., 2010	Engel et al., 2010	Systemic (Engel et al., 2010)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (Al Rwahnih et al., 2009).
Vitivirus Grapevine virus A	Fiore et al., 2008	Jones et al., 2015	Systemic (Martelli et al., 2001a)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
Vitivirus Grapevine virus B	Fiore et al., 2008	Fiore et al., 2008	Systemic (Fiore et al., 2008)	No. Fruit for consumption poses a negligible risk for establishment (Gordh and McKirdy, 2014) and are considered a dead-end pathway. Present in continental United States (UGA, 2019c).
NEMATODES				

Pest name	Presence in Chile	*Vitis vinifera* association	Plant part(s)	Considered further?
Meloidogyne luci Carneiro, et al.,	Carneiro et al., 2014	Ferris, 2014; Carneiro et al., 2014	Root (Bellé et al., 2016)	No. It does not affect the traded plant part.

2.2. Notes on pests identified in the pest list

***Copitarsia decolora* (Guenée).** Name often given as *Copitarsia consueta* (Walker) (valid name: *C. incommoda* (Walker); Simmons and Pogue, 2004) (e.g., González, 1983; Prado, 1991), which likely is a misidentification of *Copitarsia decolora* (= *C. turbata*; Simmons and Pogue, 2004). In a revision of *Copitarsia*, Angulo (2003) stated that *C. incommoda* and *C. turbata* are frequently mistaken for each other, as they are very similar in external appearance. According to Angulo (2003), *C. incommoda* does not occur in Chile and is not recorded on grape.

***Cornu aspersum* (Müller).** This snail is present in the continental United States; however, it is actionable for Florida, Alabama, Puerto Rico, U.S. Virgin Islands, Guam, and the Northern Mariana Islands (ARM, 2021). Adults and immatures are mobile and feed externally on the plant (CABI, 2021). Because of their large size (up to 32 mm; Dekle, 2017), any snails that are on the fruit are likely to be noticed and removed during harvest.

***Alternaria vitis* Cavara** and ***Dothiorella viticola* A.J.L. Phillips & J. Luque.** Fruit for consumption poses a negligible risk for the introduction of pests into new areas (Gordh and McKirdy, 2014). For fungal pathogens, the likelihood of establishment through spore dispersal is influenced by the quantity of spores produced, the number of spores that become airborne, the wind or rain direction and speed, the ability of spores to survive adverse environmental conditions, and the availability of susceptible hosts (Palm and Rossman, 2003). Fruits for consumption that reach the endangered area are likely to be consumed or, if disposed, would go to a commercial landfill.

2.3. Pests considered but not included on the pest list

2.3.1. Organisms with non-quarantine status

We found evidence of organisms that are associated with grapes, and are present in the export area, but are not of quarantine significance for the PRA area. These organisms are listed in the Appendix.

Armored scales (Hemiptera: Diaspididae): These insects are highly unlikely to establish via the fruits or vegetables for consumption pathway due to their very limited ability to disperse to new host plants (Miller, 1985; PERAL, 2007). Also, diaspidids on fruits and vegetables for consumption are considered non-actionable at U.S. ports of entry (NIS, 2008). For these reasons, armored scales are included in the Appendix rather than Table 1, even if they are not present in the PRA area.

2.4. Pests selected for further analysis or already regulated

We identified eleven quarantine pests for further analysis (Table 2).

Table 2. Pests selected for further analysis

Pest type	**Taxonomy**	**Scientific name**
Arthropod	Trombidiformes: Tenuipalpidae	*Brevipalpus chilensis* Baker
	Hemiptera: Pseudococcidae	*Pseudococcus cribata* González
		Pseudococcus meridionalis Prado
	Lepidoptera: Noctuidae	*Copitarsia decolora* (Guenée)
	Lepidoptera: Tortricidae	*Accuminulia buscki* Brown
		Bonagota salubricola (Meyrick)
		Chileulia stalactitis (Meyrick)
		Lobesia botrana Denis & Schiffermüller
		Proeulia auraria (Clarke)
		Proeulia chrysopteris (Butler)
		Proeulia triquetra Obratzov

3. Assessing Pest Risk Potential

3.1. Introduction

We estimated the risk potential for each pest selected for further analysis. Risk is described by the likelihood of an adverse event, the potential consequences, and the uncertainty associated with these parameters. For each pest, we determined if an endangered area exists within the United States and territories. The endangered area is defined as the portion of the PRA area where ecological factors favor the pest's establishment and where the pest's presence will likely result in economically important impacts. If a pest causes an unacceptable impact (i.e., is a threshold pest), that means it could adversely affect agricultural production by causing a yield loss of 10 percent or greater, by increasing U.S. production costs, or by impacting an environmentally important host or international trade. After the endangered area is defined, we assessed the pest's likelihood of introduction into that area on the imported commodity.

The likelihood of introduction is based on the potential entry and establishment of a pest. We qualitatively assess this risk using the ratings: Low, Medium, and High. The risk elements comprising the likelihood of introduction are interdependent; therefore, the model is multiplicative rather than additive. We define the risk ratings as follows:

> **High**: This outcome is highly likely to occur.
> **Medium**: This outcome is possible; but for that to happen, the exact combination of required events needs to occur.
> **Low**: This outcome is unlikely to occur because one or more of the required events are unlikely to happen, or because the full combination of required events is unlikely to align properly in time and space.

We address uncertainty associated with each risk element as follows:

> **Negligible:** Additional or more reliable evidence is very unlikely to change the rating.
> **Low:** Additional or more reliable evidence probably will not change rating.
> **Moderate:** Additional or more reliable evidence may or may not change rating.

High: Reliable evidence is not available.

3.2. Assessment

3.2.1. *Brevipalpus chilensis* (Trombidiformes: Tenuipalpidae)

The Chilean false red mite is said to be "a very destructive pest of grapevines in Chile" (Jeppson et al., 1975, p. 257). The mite feeds on the lower surface of leaves, leading to leaf drop and a curtailment of new leaf growth. Feeding also causes serious damage to young shoots. Feeding on the rachis and pedicels may cause stems and berries to dehydrate completely; under heavy attack, fruit production is reduced (Pearson and Goheen, 1988). The literature lists this mite as both a primary and secondary pest in various crops (González, 1983; Prado, 1991). Long-distance dispersal is accomplished on plant materials, as evidenced by numerous interceptions at U.S. ports (PestID, 2021). Maximal fecundity is reported to be 39 eggs per female (González, 1958). Depending on climate, there may be 3-6 generations per year (Jeppson et al., 1975), some of which may be parthenogenetic (González, 1958).

Defining the Endangered Area for *Brevipalpus chilensis* within the United States

Climatic suitability	*Brevipalpus chilensis* is reported only from Chile (Regions III [Atacama]-X [Los Lagos]) (González, 1989). A record of the species from Argentina (Prado, 1991) could not be confirmed. The distribution spans Plant Hardiness Zones 9 through 11 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States in southwestern Alaska, along the Pacific coast into southern California, Arizona, and New Mexico, along the southern parts of the Gulf states through Florida, and into the southern parts of Georgia and South Carolina, as well as in Hawaii.
Hosts in PRA Area	Hosts in the PRA area (NRCS, 2021) include **Apiaceae:** *Apium graveolens* (celery); **Chenopodiaceae:** *Dysphania ambrosioides* (Mexican tea); **Convolvulaceae:** *Convolvulus arvensis* (field bindweed); **Moraceae:** *Ficus carica* (edible fig); **Oleaceae:** *Ligustrum sinense* (Chinese privet); **Rosaceae:** *Cydonia oblonga* (quince), *Malus domestica* (apple), *Prunus dulcis* (almond), *Pyrus communis* (pear); **Rutaceae:** *Citrus* × *limon* (lemon), *C.* × *sinensis* (orange); and **Vitaceae:** *Vitis vinifera* (grape) (González, 1958; Prado, 1991).
Economically important hosts at risk[a]	Economically important hosts include almond, apple, fig, grape, lemon, orange, and pear (NASS, 2020).
Pest potential on economically important hosts at risk	*Brevipalpus chilensis* is likely to cause unacceptable consequences if introduced into the United States, because feeding by the mite can cause leaf drop, hinder new leaf growth, and dehydrate stems and berries. As noted above, several economically important fruits are hosts of the mite.
Defined Endangered Area	The endangered area encompasses the continental United States and Hawaii within Plant Hardiness Zones 9 through 11 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

Assessing the likelihood of introduction of *Brevipalpus chilensis* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Low	Grape is a primary host of the mite (González, 1989; González, 1958) and mites can be found on the fruit (Castro et al., 2004; PestID, 2021).
Likelihood of surviving post-harvest processing before shipment	High	Moderate	Since the fruit receives no water or detergent bath, inspection and hand-picking serve to locate and remove dirt, debris, damaged berries, and external pests. However, given the nature of grape bunches, which consist of large numbers of tightly packed berries, grape-feeding arthropods, particularly those of small size, that occur on the rachis or pedicel or that feed on or in the berries, could go unnoticed and thus have a significant probability of surviving post-harvest treatment. *Brevipalpus chilensis*, because of its minute size (length ≈ 400 µm) and flat form (González, 1983), could gain access to the interior of bunches, where it might easily evade detection. Visual inspection of bunches is said to not be adequate for mite detection (Miller, 1995).
Likelihood of surviving transport and storage conditions of the consignment	High	Moderate	The mite has been intercepted at U.S. ports in consignments of grapes from Chile (PestID, 2021). Moreover, special surveys detected live mites in over 10% of grape bunches sampled at U.S. ports (Miller, 1995). These results confirm that this species can survive conditions under which grapes are shipped from Chile.
Overall Likelihood of Entry	High		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Medium	Moderate	Grapes from Chile are likely sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. More than 25% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a large market for grapes from Chile may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, because grapes are imported for consumption only, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *B. chilensis* might be found. Tenuipalpid mites tend to be slow moving (Jeppson et al., 1975). Thus, *B. chilensis* is likely to have limited inherent powers of dispersal and would lack the ability to locate hosts quickly.
Likelihood of Introduction (combined likelihoods of entry and establishment)	Medium		

3.2.2. *Pseudococcus cribata* (Hemiptera: Pseudococcidae)

The biology of *P. cribata* differs from that of other mealybugs in Chile; typically, the species only has one generation per year, which begins with overwintering nymphs feeding on small shoots of grapevine. This compromises the vigor of the vine. Eventually, the nymphal crawlers settle into protected areas of the grapevine's rhytidome (bark) and rarely venture into the grape clusters (Zaviezo et al., 2015). In Chilean studies where vines were infested, no *P. cribata* were found in the grape clusters (Zaviezo et al., 2015).

The endangered area for *Pseudococcus cribata* within the United States and territories

Climatic suitability	*Pseudococcus cribata* is known only from Valparaíso to Biobío, Chile (SAG, 2021c). The distribution corresponds to Plant Hardiness Zones 8 through 10 (Takeuchi et al., 2018). Climatic conditions suitable for survival of the mealybug occur in the southern United States, from North Carolina through the Gulf states, Florida, Arkansas, and southwest to the west coast.
Hosts in PRA area	Hosts potentially at risk in the PRA area (USDA-NRCS, 2021) include **Convolvulaceae**: *Convolvulus arvensis* (field bindweed); **Ericaceae**: *Vaccinium* spp. (blueberry); **Punicaceae**: *Punica granatum* (pomegranate); **Rosaceae**: *Cydonia oblonga* (quince), *Pyrus* spp. (pear); and **Vitaceae**: *Vitis vinifera* (grape) (González, 2011; SAG, 2021c).
Economically important hosts at risk[a]	Of the hosts listed above, those of significant economic importance include blueberry, cranberry, grape, pear, pomegranate and to a lesser extent, quince (NASS, 2020).
Potential consequences on economically important hosts at risk	*Pseudococcus cribata* was identified as one of the main mealybug pests of grape in Chile (Correa et al., 2012; Correa et al., 2015). Damage caused by feeding may lead to loss of flower buds and newly formed fruits (SAG, 2021c), and a loss of vigor and reduced growth increment in vines (Zaviezo et al., 2015).
Endangered Area	The endangered area spans the continental United States within Plant Hardiness Zones 8 through 10 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017a).

The likelihood of introduction of *Pseudococcus cribata* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	Low	Negligible	*Pseudococcus cribata* was identified as one of the most common mealybug pests of grapes in Chile (Correa et al., 2012; Correa et al., 2015); however, the species rarely enters grape bunches to feed (Zaviezo et al., 2015). Therefore, we rated this risk element as Low.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving post-harvest processing before shipment	Low	N/A	Procedures for post-harvest processing of grapes were not specified. Grape berries are exported in clusters attached by the rachis; therefore, the commodity has the potential to conceal small organisms, such as mealybugs, preventing their detection and protecting them from minimal packinghouse procedures.
Likelihood of surviving transport and storage conditions of the consignment	Low	N/A	Conditions under which grapes will be stored post-harvest and shipped were not specified. However, *P. cribata* is visible to the naked eye and has long filaments extending from its posterior (González, 2011). While grape clusters could conceal some mealybugs, *P. cribata* is covered in waxy, white fluff, that pollutes the commodity and would make the insects more obvious and easier to intercept.
Overall Likelihood of Entry	Low		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	The natural mobility of adult female and later-instar mealybugs, forms likely to be associated with fruit, is limited. Adult males are usually winged and capable of flight (Mani, 2016). While localized plant-to-plant spread in a crop by crawling mealybugs is a likely occurrence (e.g., Charles, 2009; da Silva-Torres, 2013), Browning (1959) found that individuals did not move far from their natal trees, no further than leaf litter at the bases, and were not detected in the space between trees. In their study of mealybug dispersal, Grasswitz (2008) also reported that individuals showed little tendency to move away from the original point of infestation; overall, mealybugs dispersed no more than 90 cm, most moving considerably shorter distances. Only the crawler (1st-instar nymph), in its capacity to be carried on the wind, has the potential to disperse long distances (Gullan, 1997), and crawlers are a common component of the so called "aerial plankton" (Sengonca, 1999; Gertsson, 2015), the assemblage of small animals, particularly arthropods, transported in upper-altitude winds. However, wind does not appear to play a role in dispersal of crawlers from fruit on the ground surface (the likely end point for discards) (Hennessey, 2013). Air movement at or near ground level is intermittent and air speed there tends to be low (Aylor, 1993).

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
			Crawlers arriving on imported fruit would be at significant risk of starvation. Studies of the survival times of unfed crawlers under various environmental conditions suggest that they must settle and begin feeding within about 24 hours after hatch (Greathead, 1990). Other factors reducing prospects for survival and colonization of hosts by mealybugs include their small size, which increases the risk of death by desiccation, and attack by natural enemies (da Silva-Torres, 2013). For the above reasons, it is unlikely that a significant number of *P. cribata* will accompany consignments of grapes, complete development, find a suitable host and a mate, and establish. Therefore, we rate the likelihood of establishment as Low.
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.3. *Pseudococcus meridionalis* (Hemiptera: Pseudococcidae)

Described in 2011, *Pseudococcus meridionalis* is occasionally referred to by the junior synonym *Pseudococcus rubigena* González in the literature (González and Prado, 2012; García Morales et al., 2016; González, 2011). This mealybug has three to four generations a year. The first generation emerges from the soil and typically colonizes lower parts of the host plant. Subsequent generations spread into the foliage and fruit clusters of grapevines (Zaviezo et al., 2015). Contact insecticides are an effective treatment (Zaviezo et al., 2015).

The endangered area for *Pseudococcus meridionalis* within the United States and territories

Climatic suitability	*Pseudococcus meridionalis* is distributed from the regions Coquimbo to Maule, Chile (González, 2011; SAG, 2021d). The distribution corresponds to Plant Hardiness Zones 7 through 11 (Takeuchi et al., 2018). Climatic conditions suitable for survival of the mealybug occur in the continental United States, from New York through the Atlantic and Gulf states, from Florida, southwest to the west coast and north up to Kentucky and Oklahoma, as well as parts of Hawaii.

Hosts in PRA area	Hosts potentially at risk in the PRA area (USDA-NRCS, 2021) include **Ericaceae**: *Vaccinium* spp. (blueberry); **Punicaceae**: *Punica granatum* (pomegranate); **Rosaceae**: *Cydonia oblonga* (quince), *Pyrus* spp. (pear); and **Vitaceae**: *Vitis vinifera* (grape) (García Morales et al., 2016; González, 2011; SAG, 2021d).
Economically important hosts at risk[a]	Of the hosts listed above, those of significant economic importance include blueberry, grape, pear, pomegranate, and to a lesser extent, quince (NASS, 2020).
Potential consequences on economically important hosts at risk	*Pseudococcus meridionalis* was identified as one of the main mealybug pests of grape in Chile (Correa et al., 2012; Correa et al., 2015). Damage caused by feeding may lead to loss of flower buds and newly formed fruits and a loss of vigor and reduced growth increment in vines (Zaviezo et al., 2015).
Endangered Area	The endangered area spans the continental United States and Hawaii within Plant Hardiness Zones 7 through 11 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017a).

The likelihood of introduction of *Pseudococcus meridionalis* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Negligible	*Pseudococcus meridionalis* was identified as one of the most common mealybug pests of grapes in Chile (Correa et al., 2012; Correa et al., 2015). The species is multivoltine and has at least three generations a year; the second and later generations feed in grape bunches where they oviposit (Zaviezo et al., 2015). Therefore, we ranked the risk rating as High.
Likelihood of surviving post-harvest processing before shipment	High	N/A	Procedures for post-harvest processing of grapes were not specified. Grape berries are exported in clusters attached by the rachis; therefore, the commodity has the potential to conceal small organisms, such as mealybugs, preventing their detection and protecting them from minimal packinghouse procedures.

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Likelihood of surviving transport and storage conditions of the consignment	Medium	N/A	Conditions under which grapes will be stored post-harvest and shipped were not specified. *Pseudococcus meridionalis* is visible to the naked eye and has long filaments extending from its posterior (García Morales et al., 2016; [referred to by junior synonym *P. rubigena* González, 2011]). While grape clusters could conceal some mealybugs, *P. meridionalis* is covered in waxy, white fluff, that pollutes the commodity and would make the insect more obvious and easier to intercept. For these reasons, we reduced our risk rating to Medium.
Overall Likelihood of Entry	Medium		

Likelihood of Establishment	Low	Low	The natural mobility of adult female and later-instar mealybugs, forms likely to be associated with fruit, is limited. Adult males are usually winged and capable of flight (Mani, 2016). While localized plant-to-plant spread in a crop by crawling mealybugs is a likely occurrence (e.g., Charles, 2009; da Silva-Torres, 2013), Browning (1959) found that individuals did not move far from their natal trees, no further than leaf litter at the bases, and were not detected in the space between trees. In their study of mealybug dispersal, Grasswitz (2008) also reported that individuals showed little tendency to move away from the original point of infestation; overall, mealybugs dispersed no more than 90 cm, most moving considerably shorter distances. Only the crawler (1st-instar nymph), in its capacity to be carried on the wind, has the potential to disperse long distances (Gullan, 1997), and crawlers are a common component of the so called "aerial plankton" (Sengonca, 1999; Gertsson, 2015), the assemblage of small animals, particularly arthropods, transported in upper-altitude winds. However, wind does not appear to play a role in dispersal of crawlers from fruit on the ground surface (the likely end point for discards) (Hennessey, 2013). Air movement at or near ground level is intermittent and air speed there tends to be low (Aylor, 1993). Crawlers arriving on imported fruit would be at significant risk of starvation. Studies of the survival times of unfed crawlers under various environmental conditions suggest that they must settle and begin feeding within about 24 hours after hatch (Greathead, 1990). Other factors reducing prospects for survival and colonization of hosts by mealybugs include their small size, which increases the risk of death by desiccation, and attack by natural enemies (da Silva-Torres, 2013). For the above reasons, it is unlikely that a significant number of *P. meridionalis* will accompany consignments of grapes, complete

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
			development, find a suitable host and a mate, and establish. Therefore, we rated the likelihood of establishment as Low.
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.4. *Copitarsia decolora* (Lepidoptera: Noctuidae)

Copitarsia decolora is a moth found in Central and South America (Simmons and Pogue, 2004). It is a pest that feeds on a wide variety of agricultural hosts; it is the most polyphagous species in its genus (Gould et al., 2013). Females can lay over 1,000 eggs and up to three generations per year have been reported (Gould et al., 2013).

The endangered area for *Copitarsia decolora* within the United States and territories

Climatic suitability	*Copitarsia decolora* is present in **North America:** Costa Rica, Guatemala, Mexico and **South America:** Argentina, Chile, Colombia, Ecuador, Peru, Uruguay, and Venezuela (Angulo and Olivares, 2003; Simmons and Pogue, 2004). These areas include Plant Hardiness Zones 8 through 13 (Takeuchi et al., 2018). Climatic conditions suitable for survival of this moth occur across the southern United States, and along the west coast. Hawaii and the territories are also climactically compatible. The climate in the northern states and Alaska are unlikely to support this species.
Hosts in PRA area	Host plants present in the PRA area include **Actinidiaceae:** *Actinidia* sp. (kiwifruit); **Asparagaceae:** *Asparagus officinalis* (asparagus); **Asteraceae:** *Cynara scolymus* (artichoke), *Helianthus* sp. (sunflower); **Brassicaceae:** *Brassica oleracea* (cabbage); **Chenopodiaceae:** *Beta vulgaris* (sugar beet); **Fabaceae:** *Cicer arietinum* (chickpea), *Medicago sativa* (alfalfa), *Vicia faba* (fava bean); **Liliaceae:** *Allium cepa* (onion), *Allium sativum* (garlic); **Poaceae:** *Triticum aestivum* (wheat), *Zea mays* (corn); **Rosaceae:** *Fragaria* × *ananassa* (strawberry), *Malus domestica* (apple), *Rubus* sp. (raspberry); **Simmondsiaceae:** *Simmondsia chinensis* (jojoba); **Solanaceae:** *Capsicum annuum* (chili pepper), *Nicotiana tabacum* (tobacco), *Solanum tuberosum* (potato); and **Vitaceae:** *Vitis vinifera* (grape) (Angulo and Olivares, 2003; NRCS, 2021).
Economically important hosts at risk[a]	Economically important hosts include alfalfa, apple, artichoke, asparagus, chickpea, corn, garlic, grape, onion, potato, raspberry, strawberry, sugar beet, sunflower, tobacco, and wheat (NASS, 2020).

Potential consequences on economically important hosts at risk	This pest is likely to cause unacceptable consequences because *Copitarsia decolora* is said to be one of the most economically important members of its genus (Simmons and Pogue, 2004). In Peru, the species is a major pest of potato (Alcalá, 1978), and is one of a complex of pests (including *Spodoptera eridania* Stoll and agromyzid leafminers) of broad bean (*Vicia faba*), which reduces yield by 50-60% (Gomez Tovar, 1972). Defoliation on the order of 60% has been reported in rapeseed (*Brassica napus* var. *napus*), although with no appreciable effect on yield (Larraín S., 1996). The noctuid may also be a significant pest of quinoa (*Chenopodium quinoa*) in Chile (Lamborot et al., 1999), and infests cut flowers for export in Colombia (Moreno Fajardo and Serna Cardona, 2006). However, González (1983) considered the moth (identified as *C. consueta*) to be only an occasional pest in vineyards. A survey of agricultural and forestry pests in Chile found *C. decolora* to be "highly damaging" (Klein Koch and Waterhouse, 2000).
Endangered Area	The endangered area includes Plant Hardiness Zones 8 through 13 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017b).

The likelihood of introduction of *Copitarsia decolora* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	Low	Moderate	In general, *Copitarsia* spp. larvae are reported to feed on the leaves, stems, and fruits of host plants (Venette and Gould, 2006). Few details were found regarding the prevalence of the insect on grapes, but González (1983) considers it an occasional pest in grape. Therefore, we assign a risk rating of "Low".
Likelihood of surviving post-harvest processing before shipment	Low	N/A	Post-harvest processes were not considered as part of this assessment; therefore, the risk rating remains unchanged.
Likelihood of surviving transport and storage conditions of the consignment	Low	N/A	Transport and storage conditions were not considered as part of this assessment; therefore, the risk rating remains unchanged.
Overall Likelihood of Entry	Low		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	Grapes from Chile are likely sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. More than 25% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a market for grapes from Chile of at least moderate size may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, because table grapes are imported for consumption only, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *C. decolora* might be found. Since they lack wings, larvae of *C. decolora* have limited powers of dispersal, and thus lack the ability to locate hosts quickly. Moreover, the species has been recorded on a limited number of hosts, which may not be common in the landscape. In the unlikely event that a larva would come into contact with a suitable host to colonize, particularly given the myriad mortality sources in the environment arrayed against early-instar Lepidoptera (Zalucki et al., 2002), the prospects for its survival likely would be bleak. Even if development could be completed in discarded grapes, successful reproduction would be in doubt. The pest would have a low probability of encountering hosts and thus, a low likelihood of establishment.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.5. *Accuminulia buscki* (Lepidoptera: Tortricidae)

Accuminulia buscki is considered only an occasional pest in Chile (Cepeda, 2014). Damage is caused by larvae boring into fruit (Brown, 1999). We found no information on the biology of the species. However, we assume that it would behave similarly to that of other tortricids, that is larvae feed on leaves and fruit often within a silken structure.

Defining the Endangered Area for *Accuminulia buscki* within the United States

Climatic suitability	*Accuminulia buscki* is known only from Chile (Regions IV [Coquimbo]-XVI [Ñuble]) (Brown, 1999). The distribution extends across Plant Hardiness Zones 10 through 11 (Takeuchi et al., 2018). Climatic conditions suitable for survival of the species occur in areas of the continental United States along the Pacific coast into southern California and southwestern Arizona, and along southern areas of the Gulf states to the lower half of Florida, as well as in Hawaii.
Hosts in PRA Area	Hosts in the PRA area (NRCS, 2021) include **Rosaceae:** *Prunus armeniaca* (apricot), *Prunus domestica* (plum), *Prunus persica* (peach); and **Vitaceae:** *Vitis vinifera* (grape) (Brown, 1999).
Economically important hosts at risk[a]	Apricot, grape, peach, and plum are of economic importance to the United States (NASS, 2020).
Pest potential on economically important hosts at risk	*Accuminulia buscki* is likely to cause unacceptable consequences if introduced into the United States because the larvae can bore into fruit (Brown, 1999). All the fruits noted above are economically important to the United States.
Defined Endangered Area	The endangered area encompasses the continental United States and Hawaii within Plant Hardiness Zones 10 through 11 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

Assessing the likelihood of introduction of *Accuminulia buscki* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Low	Grape appears to be a preferred host of the moth and larvae can be found on the fruit (Brown, 1999).

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving post-harvest processing before shipment	High	Moderate	Since the fruit receives no water or detergent bath, inspection and hand-picking serve to locate and remove dirt, debris, damaged berries, and external pests. However, given the nature of grape bunches, which consist of large numbers of tightly packed berries, grape-feeding arthropods, particularly those of small size, that occur on the rachis or pedicel or that feed on or in the berries, such as *A. buscki* (Brown, 1999), could go unnoticed and thus have a significant probability of surviving post-harvest treatment.
Likelihood of surviving transport and storage conditions of the consignment	Medium	Moderate	There is only one interception record for the moth (an adult) (Brown, 1999), suggesting that it moves very rarely in consignments of Chilean grapes.
Overall Likelihood of Entry	Medium		

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Likelihood of Establishment	Low	Moderate	Grapes from Chile are likely sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. About 11% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a market for grapes from Chile of at least moderate size may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, because table grapes are imported for consumption only, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *A. buscki* might be found. Since they lack wings, larvae of *A. buscki* have limited powers of dispersal, and thus lack the ability to locate hosts quickly. Moreover, the species has been recorded on a limited number of hosts, which may not be common in the landscape. In the unlikely event that a larva would come into contact with a suitable host to colonize, particularly given the myriad mortality sources in the environment arrayed against early-instar Lepidoptera (Zalucki et al., 2002), the prospects for its survival likely would be bleak. Even if development could be completed in discarded grapes, successful reproduction would be in doubt. Adult *A. buscki* are small moths (body length ≈ 7 mm; Brown, 1999), and there is no evidence to suggest that they are strong fliers capable of long-distance dispersal. On balance, the above considerations suggest that the pest would have a low probability of encountering hosts and thus, a low likelihood of establishment.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.6. *Bonagota salubricola* (Lepidoptera: Tortricidae)

The apple leafroller moth is an economically important pest in South America (Bentancourt et al., 2004; Brown and Passoa, 1998; Chambon et al., 1997). Larvae feed on fruit surfaces, expediting rot (Bentancourt, 2006), and spin silken sheets on the underside of leaves (Bentancourt, 2006). *Bonagota salubricola* is commonly referred to by its synonym *Bonagota cranaodes* (Meyrick) in the literature (Brown, 2006).

The endangered area for *Bonagota salubricola* within the United States and territories

Climatic suitability	*Bonagota salubricola* is present in **South America:** Argentina, Brazil, Chile, Paraguay, Uruguay (Brown, 2006; Chambon et al., 1997). The expansive distribution corresponds to Plant Hardiness Zones 7 through 13 (Takeuchi et al., 2018). Climatic conditions suitable for survival of *B. salubricola* occur in all the southern United States, the Atlantic coastal states from New York west through the Gulf states, throughout most of the southwest states and the west coast. Hawaii and the territories are also climactically compatible. The climate in the northern states and Alaska are unlikely to support this species.
Hosts in PRA area	Hosts in the PRA area (NRCS, 2021) include **Caprifoliaceae:** *Lonicera japonica* (Japanese honeysuckle); **Convolvulaceae:** *Ipomoea indica* (ocean-blue morning glory); **Cupressaceae:** *Taxodium distichum* (bald cypress); **Fabaceae:** *Medicago sativa* (alfalfa), *Mimosa* sp.; **Oleaceae:** *Ligustrum lucidum* (glossy privet), **Polygonaceae:** *Polygonum* sp. (knotweed); **Rosaceae:** *Malus domestica* (apple), *Prunus domestica* (plum), *Pyrus communis* (pear); **Rutaceae:** *Citrus× paradisi* (grapefruit); **Salicaceae:** *Salix alba* "*viellina*" (white willow); and **Vitaceae**: *Vitis vinifera* (grape) (Bentancourt et al., 2004; Brown and Passoa, 1998; Chambon et al., 1997).
Economically important hosts at risk[a]	Of the hosts listed above, those of significant economic importance include apple, alfalfa, grapefruit, peach, and pear (NASS, 2020).

Potential consequences on economically important hosts at risk	*Bonagota salubricola* may be the most economically important insect pest on apple in the neotropics (Liblikas, 2004), accounting for an annual crop loss of 3-5% (Bentancourt et al., 2004). The damage is caused by larvae feeding on apple leaves and the surface of fruits, causing severe damage if not managed by insecticides (Pastori et al., 2012). However, an effective trap and kill strategy with sex pheromones was developed in Brazilian orchards to combat this pest (Pastori et al., 2012). In grapevine, specific control measures are usually not necessary, but the larvae do feed on the surface of grape berries, allowing entry points for rot organisms (Bentancourt et al., 2004).
Endangered Area	The endangered area spans the entire United States, Hawaii, and territories within Plant Hardiness Zones 7 through 13 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017a).

The likelihood of introduction of *Bonagota salubricola* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Negligible	*Bonagota salubricola* is a pest of grapevine and apples in its native range (Bentancourt et al., 2004; Brown and Passoa, 1998; Pastori et al., 2012). In the laboratory, larvae showed they could reach maturity fed on grape berries alone (Bentancourt et al., 2004). Therefore, we ranked this rating as High.
Likelihood of surviving post-harvest processing before shipment	Medium	Moderate	Procedures for post-harvest processing of grapes were not specified. Grape berries are exported in clusters attached by the rachis; therefore, the commodity has the potential to conceal small organisms, such as caterpillars, preventing their detection and protecting them from minimal packinghouse procedures. *Bonagota salubricola* larvae tend to spin sheets of silk over their feeding sites; this would make the insect more obvious, and some culling would likely occur in the field.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving transport and storage conditions of the consignment	Medium	Moderate	Conditions under which grapes will be stored post-harvest and shipped were not specified. However, U.S. agriculture inspectors have never intercepted *Bonagota* spp. in shipments of grapes from Chile. Since *B. salubricola* is visible to the naked eye, is a fruit surface feeder, and causes grapes to rot after feeding (Bentancourt et al., 2004), we would expect more interceptions from inspectors.
Overall Likelihood of Entry	Medium		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	Grapes from Chile are likely sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. More than 25% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a large market for grapes from Chile may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Eggs and larvae are the most likely life stages to follow the pathway as adults would disperse during harvest. The natural mobility of leafroller caterpillars is limited and they would not be able to locate hosts quickly. Typically, larvae feed on leaves and the surface of fruits, where they weave silken shelters (Bentancourt, 2006). Sheets of silk would make the larvae more visible during the harvesting of grapes, and the behavior would also make the insect more obvious and easier for U.S. Agricultural inspectors to intercept. While larvae can fully develop on grape berries alone (Bentancourt et al., 2004), their feeding deflates the grapes and expedites rot. For the above reasons, it is unlikely that a significant number of *B. salubricola* will accompany consignments of grapes, complete development, find a suitable host and a mate, and establish. Therefore, we rate the likelihood of establishment as Low.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.7. *Chileulia stalactitis* (Lepidoptera: Tortricidae)

Chileulia stalactitis (syn.: *Eulia stalactitis* Meyrick; Brown, 2005) has been considered an ecological homologue of *Paralobesia viteana* (Clemens) (syn.: *Endopiza viteana* Clemens; Brown, 2005) (González, 1983), an important tortricid pest of grape in North America (e.g., Hoffman et al., 1992). In grape, several berries may be damaged by a single *C. stalactitis* larva, and attack may render the fruit vulnerable to secondary organisms of decay, such as *Botrytis* sp. (González, 1983). *Chileulia stalactitis* was among those insects considered of agricultural importance in Chile by Prado (1988). González (1983) considered it only a secondary pest of grape. Little information is available on the life cycle of this moth. There may be as many as three generations per year in Chile (González, 1983).

Defining the Endangered Area for *Chileulia stalactitis* within the United States

Climatic suitability	*Chileulia stalactitis* is reported from Argentina (Bariloche [Rio Negro], La Cruz [Corrientes]) and Chile (Regions V [Valparaíso], Metropolitan, VI [O'Higgins], and X [Los Lagos: Casa Pangue]) (González, 1983; Prado, 1988; Brown, 2005). The distribution corresponds to Plant Hardiness Zones 7 through 10 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States in southwestern Alaska, along the West Coast in much of Washington, Oregon, and California, throughout the lower third of the country, and north along the eastern seaboard to southern New England.
Hosts in PRA Area	Hosts in the PRA area (NRCS, 2021) include **Rosaceae:** *Prunus armeniaca* (apricot), *Prunus domestica* (plum); **Rutaceae:** *Citrus* × *paradisi* (grapefruit), *Citrus* × *sinensis* (orange); and **Vitaceae:** *Vitis vinifera* (grape) (Powell, 1986).
Economically important hosts at risk[a]	Apricot, grape, grapefruit, orange, and plum are of economic importance to the United States (NASS, 2020).
Pest potential on economically important hosts at risk	*Chileulia stalactitis* is likely to cause unacceptable consequences if introduced into the United States, because larvae can feed on the fruit, leading to secondary infection. As noted above, the moth is a pest of agricultural importance and attacks several economically important fruit crops.
Defined Endangered Area	The endangered area encompasses the continental United States within Plant Hardiness Zones 7 through 10 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

Assessing the likelihood of introduction of *Chileulia stalactitis* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Low	Grape is a common host of the moth (González et al., 1973; González, 1983; Powell, 1986; Prado, 1991), and larvae can be found on the fruit (González, 1983).
Likelihood of surviving post-harvest processing before shipment	High	Moderate	Since the fruit receives no water or detergent bath, inspection and hand-picking serve to locate and remove dirt, debris, damaged berries, and external pests. However, given the nature of grape bunches, which consist of large numbers of tightly packed berries, grape-feeding arthropods, particularly those of small size, that occur on the rachis or pedicel or that feed on or in the berries, such as *C. stalactitis* (González, 1983), could go unnoticed and thus, have a significant probability of surviving post-harvest treatment.
Likelihood of surviving transport and storage conditions of the consignment	Medium	Moderate	A total lack of U.S. port interceptions on grape consignments from Chile (PestID, 2021) suggests that *C. stalactitis* moves very rarely in that commodity.
Overall Likelihood of Entry	Medium		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	Grapes from Chile likely are sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. More than 25% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a large market for grapes from Chile may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, since table grapes are imported for consumption only, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *C. stalactitis* might be found. Since they lack wings, larvae of *C. stalactitis* have limited powers of dispersal, and thus, lack the ability to locate hosts quickly. Moreover, the species has been recorded on a limited number of hosts, which may not be common in the landscape. In the unlikely event that a larva would come into contact with a suitable host to colonize, particularly given the myriad mortality sources in the environment arrayed against early-instar Lepidoptera (Zalucki et al., 2002), the prospects for its survival likely would be bleak. Even if development could be completed in discarded grapes, successful reproduction would be in doubt. Adult *C. stalactitis* are small moths (wingspan: 12-15 mm; González, 1983), and there is no evidence to suggest that they are strong fliers capable of long-distance dispersal. On balance, the above considerations suggest that the pest would have a low probability of encountering hosts and thus, a low likelihood of establishment.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.8. *Lobesia botrana* (Lepidoptera: Tortricidae)

The European grapevine moth (syn.: *Polychrosis botrana* [Denis & Schiffermüller]; Brown, 2005) is an important pest of grape, in which losses of 80% have been reported (Whittle, 1985). Apart from the impact of direct larval feeding or tunneling, a major contributor to yield loss is infection of damaged berries by opportunistic saprophytes or pathogens, particularly *Botrytis cinerea* (Roehrich and Boller, 1991; CABI, 2021). Further losses accrue from the time and labor spent in cleaning bunches of the silk webbing and feces deposited by larvae, which may account for 30-40% of the harvesting effort (Avidov and Harpaz, 1969). In viticulture, the damage caused, particularly fungal contamination, interferes with the wine-making process and may result in a product of low quality (Rousseau et al., 2005). Damage to other fruit crops, such as persimmon and pome and stone fruit, may be significant (Ben-Yehuda et al., 1999), and may result from larvae feeding and developing within fruit (Maison and Pargade, 1967). Mobility of adults apparently is limited. Schmitz et al. (1996) found dispersal of virgin females within vineyards rarely to exceed 80 m. Males were observed to disperse no more than 40 m (Saour, 2016). However, larvae may be moved across long distances within fruit in passenger baggage or cargo; the moth has been intercepted at U.S. ports numerous times (PestID, 2021). Fecundity may exceed 300 eggs per female; a maximum of four generations per year has been recorded (Avidov and Harpaz, 1969).

Defining the Endangered Area for *Lobesia botrana* within the United States

Climatic suitability	*Lobesia botrana* has been reported from **Africa:** Algeria, Egypt, Eritrea, Ethiopia, Kenya, Libya, Morocco; **Asia:** Armenia, Azerbaijan, Georgia, Iran, Iraq, Israel, Jordan, Kazakhstan, Lebanon, Syria, Tajikistan, Turkey, Turkmenistan, Uzbekistan; **Europe:** Albania, Austria, Belarus, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France (including Corsica), Germany (Rhineland-Palatinate), Greece (including Crete), Hungary, Italy (including Sardinia and Sicily), Lithuania, Luxembourg, Macedonia, Malta, Moldova, Montenegro, Poland, Portugal, Romania, Russia, Serbia, Slovakia (Bratislava), Slovenia, Spain (including Balearic Islands), Switzerland, United Kingdom (England, Wales), Ukraine; **Oceania:** Samoa, Tuvalu; and **South America:** Argentina, Chile (Hopkins, 1927; CABI/EPPO, 2012). The distribution extends across Plant Hardiness Zones 7 through 14 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States in southwestern Alaska, along the West Coast, throughout the southern third of the country, and north along the eastern seaboard to southern New England, as well as in Hawaii and the territories.

Hosts in PRA Area	Hosts in the PRA area (NRCS, 2021) include **Anacardiaceae:** *Rhus glabra* (smooth sumac); **Araliaceae:** *Hedera helix* (English ivy); **Asteraceae:** *Tanacetum vulgare* (common tansy); **Berberidaceae:** *Berberis vulgaris* (common barberry); **Ebenaceae:** *Diospyros virginiana* (persimmon); **Fabaceae:** *Medicago sativa* (alfalfa), *Trifolium pratense* (red clover); **Grossulariaceae:** *Ribes rubrum* (currant), *R. uva-crispa* (European gooseberry); **Oleaceae:** *Ligustrum vulgare* (European privet), *Olea europaea* (olive), *Syringa vulgaris* (common lilac); **Ranunculaceae:** *Clematis vitalba* (evergreen clematis); **Rosaceae:** *Prunus domestica* (plum), *P. spinosa* (blackthorn), *Pyrus communis* (pear); **Rubiaceae:** *Coffea arabica* (coffee); **Solanaceae:** *Solanum tuberosum* (potato); and **Vitaceae:** *Vitis vinifera* (grape) (Whittle, 1985; Brown et al., 2008).
Economically important hosts at risk[a]	Economically important hosts include alfalfa, coffee, grape olive, pear, plum, and potato (NASS, 2020).
Pest potential on economically important hosts at risk	*Lobesia botrana* is likely to cause unacceptable consequences if introduced into the United States, because larvae feed and tunnel in the fruit (Roehrich and Boller, 1991; CABI, 2021b). As noted above, the moth is serious pest of grape and other fruit crops.
Defined Endangered Area	The endangered area encompasses the continental United States, Hawaii, and the territories within Plant Hardiness Zones 7 through 14 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

Assessing the likelihood of introduction of *Lobesia botrana* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Low	Grape is a primary host of the moth (Whittle, 1985; Moreau et al., 2016) and larvae feed on the fruit (NHM, 2021; Vassiliou, 2011).
Likelihood of surviving post-harvest processing before shipment	High	Moderate	Since the fruit receives no water or detergent bath, inspection and hand-picking serve to locate and remove dirt, debris, damaged berries, and external pests. Eggs of *L. botrana* are laid singly on berries; larvae feed within a single berry or, later in the season, on several berries (Gilligan and Epstein, 2014). Given the nature of grape bunches, which consist of large numbers of tightly packed berries, eggs and larvae could go unnoticed and thus have a significant probability of surviving post-harvest treatment.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving transport and storage conditions of the consignment	High	Moderate	Transport and storage conditions were not considered in this risk assessment. While there is a lack of U.S. port interceptions on grape consignments from Chile (PestID, 2021), this may be misleading because *Lobesia* was introduced into Chile after the mandatory methyl bromide fumigation requirements were in place. Therefore, the risk rating remains unchanged.
Overall Likelihood of Entry	High		

Likelihood of Establishment	Medium	High	Grapes from Chile are likely sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. More than 25% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a large market for grapes from Chile may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, since grapes are imported for consumption only, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *L. botrana* might be found. Since they lack wings, larvae of *L. botrana* have limited powers of dispersal, and thus lack the ability to locate hosts quickly. In the unlikely event that a larva would come into contact with a suitable host to colonize, particularly given the myriad mortality sources in the environment arrayed against early-instar Lepidoptera (Zalucki et al., 2002), the prospects for its survival likely would be bleak. Even if development could be completed in discarded grapes, successful reproduction would be unlikely. Eggs are laid singly on berries; upon hatching, larvae penetrate the pulp, one per fruit (Whittle, 1985). Thus, adults, having developed individually in infested fruit, would emerge in isolation. As noted above, mobility in adults is limited. Also, there is a tendency in unmated females towards reduced flight activity (Hurtrel and Thiéry, 1999). The above considerations suggest that the prospects for successful host- or mate-finding likely would be limited. Despite these obstacles, we rated likelihood of establishment as Medium, because grape is a

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
			preferred host, larvae can feed inside the fruit, and this species has been shown to establish outside of its native range (CABI 2021). We increased the uncertainty rating due to the many obstacles this pest would encounter establishing via this pathway.
Likelihood of Introduction (combined likelihoods of entry and establishment)	Medium		

3.2.9. *Proeulia auraria* (Clarke) (Lepidoptera: Tortricidae)
In Chile, *P. auraria* is a pest of *Prunus* and *Pyrus communis* (pear), causing significant direct and indirect damage to these fruit crops (González, 1983). In pear, larvae destroy flowers and newly set fruit, and orchards subject to insecticidal applications may sustain losses up to 30% in certain varieties (e.g., d'Anjou, Packham's Triumph). On grapevines, larvae enter buds and destroy growing points, attack newly opened leaves (Campos et al., 1981), and feed externally on berries, which makes them unmarketable and facilitates the development of *Botrytis* rots (González, 1983; Flores et al., 2021). In citrus, larvae bore into fruit, producing a gallery 5-6 mm deep (González, 1983). Depending on host crop attacked and locality, *P. auraria* is considered either a primary or secondary pest in Chile, for which insecticidal treatments are prescribed (González, 1983). Campos et al., (1981) studied aspects of the biology of the moth. Maximal fecundity was 300 eggs per female. There were two to three generations per year. Adults were present throughout the year.

Defining the Endangered Area for *Proeulia auraria* within the United States

Climatic suitability	*Proeulia auraria* is reported only from Chile (Regions III [Atacama], IV [Coquimbo: Coquimbo], V [Valparaiso: Quillota, Valparaiso], Metropolitan [Santiago], VI [O'Higgins: Peumo], and VII [Maule: Curicó, Sagrada Familia (Campos et al., 1981; Prado, 1991). A record of the species from Argentina (Trematerra and Brown, 2004) could not be confirmed. The distribution extends across Plant Hardiness Zones 9 through 11 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States in southwestern Alaska, along the Pacific coast into southern California, Arizona, and New Mexico, along the southern parts of the Gulf states through Florida, and into the southern parts of Georgia and South Carolina, as well as in Hawaii.
Hosts in PRA Area	Hosts in the PRA area include **Fabaceae:** *Robinia pseudoacacia* (black locust); **Rosaceae:** *Malus domestica* (apple), *Prunus armeniaca* (apricot), *P. avium* (sweet cherry), *P. domestica* (plum), *Pyrus communis* (pear); **Rutaceae:** *Citrus × sinensis* (orange); and **Vitaceae:** *Vitis vinifera* (grape) (Campos et al., 1981; González, 1983; Brown and Passoa, 1998; Brown et al., 2008).

Economically important hosts at risk[a]	Economically important hosts include apple, apricot, grape, plum, orange, and sweet cherry (NASS, 2020).
Pest potential on economically important hosts at risk	*Proeulia auraria* is likely to cause unacceptable consequences if introduced into the United States, because larvae may feed on growing points and fruit of host plants (Campos et al., 1981). As noted above, the moth is a pest of several economically important fruit crops.
Defined Endangered Area	The endangered area encompasses the continental United States and Hawaii within Plant Hardiness Zones 9 through 11 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

Assessing the likelihood of introduction of *Proeulia auraria* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Low	Grape is a primary host of the moth (González, 1989) and larvae feed on the fruit (Brown, 1998; Capinera, 2008; González, 1983).
Likelihood of surviving post-harvest processing before shipment	High	Moderate	Since the fruit receives no water or detergent bath, inspection and hand-picking serve to locate and remove dirt, debris, damaged berries, and external pests. However, given the nature of grape bunches, which consist of large numbers of tightly packed berries, grape-feeding arthropods, particularly those of small size, that occur on the rachis or pedicel or that feed on or in the berries, such as *P. auraria* (González, 1983), could go unnoticed and thus have a significant probability of surviving post-harvest treatment.
Likelihood of surviving transport and storage conditions of the consignment	Medium	Moderate	A total lack of U.S. port interceptions on grape consignments from Chile (PestID, 2021) suggests that *P. auraria* moves extremely rarely in that commodity.
Overall Likelihood of Entry	Medium		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	Grapes from Chile are likely sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. More than 25% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a large market for grapes from Chile may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, since table grapes are imported only for consumption, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *P. auraria* might be found. Since they lack wings, larvae of *P. auraria* have limited powers of dispersal, and thus, lack the ability to locate hosts quickly. Moreover, the species has been recorded on a limited number of hosts, which may not be common in the landscape. In the unlikely event that a larva would come into contact with a suitable host to colonize, particularly given the myriad mortality sources in the environment arrayed against early-instar Lepidoptera (Zalucki et al., 2002). The prospects for its survival likely would be bleak. Even if development could be completed in discarded grapes, successful reproduction would be in doubt. Adult *P. auraria* are small moths (wingspan: 17-27 mm; González, 1983), and there is no evidence to suggest that they are strong fliers capable of long-distance dispersal. On balance, the above considerations suggest that the pest would have a low probability of encountering hosts and, thus, a low likelihood of establishment.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.10. *Proeulia chrysopteris* (Lepidoptera: Tortricidae)

Proeulia chrysopteris is a primary pest of kiwi (*Actinidia chinensis*) (González, 1989). In *Pinus radiata* plantations, the moth is considered to be a secondary pest, its feeding damage of no direct significance, but rendering the trees vulnerable to infection by plant pathogens (Parra and Cerda, 1991). Little information is available on the life cycle of the moth. Two generations per year have been reported (González, 1989).

Defining the Endangered Area for *Proeulia chrysopteris* within the United States

Climatic suitability	*Proeulia chrysopteris* has been reported from Chile and Argentina (Brown and Passoa, 1998). In Chile, its range extends from Region V (Valparaiso) to Region VIII (Biobío) (González, 1989; Parra and Cerda, 1991). The distribution corresponds to Plant Hardiness Zones 9 through 11 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States in southwestern Alaska, along the Pacific coast into southern California, Arizona, and New Mexico, along the southern parts of the Gulf states through Florida, and into the southern parts of Georgia and South Carolina, as well as in Hawaii.
Hosts in PRA Area	Hosts in the PRA area (NRCS, 2021) include **Betulaceae:** *Corylus avellana* (hazelnut); **Caprifoliaceae:** *Lonicera japonica* (Japanese honeysuckle); **Ericaceae:** *Vaccinium corymbosum* (blueberry); **Pinaceae:** *Pinus radiata* (Monterey pine); **Rosaceae:** *Malus domestica* (apple), *Prunus armeniaca* (apricot), *P. cerasifera* (cherry plum), *P. domestica* (plum), *P. persica* (peach), *Pyrus communis* (pear); **Rutaceae:** *Citrus × sinensis* (orange); **Salicaceae:** *Salix babylonica* (weeping willow); and **Simmondsiaceae:** *Simmondsia chinensis* (jojoba) (Brown and Passoa, 1998; Cepeda and Cubillos, 2011).
Economically important hosts at risk[a]	Economically important hosts include apple, apricot, blueberry, hazelnut, orange, peach, pear, and plum (NASS, 2020).
Pest potential on economically important hosts at risk	*Proeulia chrysopteris* is likely to cause unacceptable consequences if introduced into the United States because feeding damage from larvae leaves host plants vulnerable to infection by pathogens (Parra and Cerda, 1991). As noted above, the moth is a pest of several economically important fruit crops.

Defined Endangered Area	The endangered area encompasses the continental United States and Hawaii within Plant Hardiness Zones 9 through 11 where host plants are found.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

Assessing the likelihood of introduction of *Proeulia chrysopteris* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	Low	Low	There is no convincing evidence that *V. vinifera* is a normal or usual host of *P. chrysopteris*. The plant has been listed as a host of the moth, without supporting evidence, in a few published sources (e.g., Klein Koch and Waterhouse, 2000; CABI, 2021), and was identified as a host by the government of Chile (SAG, 2021a). However, grape is not included among hosts in any of the comprehensive works focused on agricultural pests in Chile (González et al., 1973; González, 1983, 1989; Cepeda and Cubillos, 2011). Common hosts of the moth are pome and stone fruits and citrus.
Likelihood of surviving post-harvest processing before shipment	Low	Low	Since the fruit receives no water or detergent bath, inspection and hand-picking serve to locate and remove dirt, debris, damaged berries, and external pests. However, given the nature of grape bunches, which consist of large numbers of tightly packed berries, grape-feeding arthropods, particularly those of small size, that occur on the rachis or pedicel or that feed on or in the berries (González, 1983), could go unnoticed and thus have a significant probability of surviving post-harvest treatment.
Likelihood of surviving transport and storage conditions of the consignment	Low	Low	A total lack of U.S. port interceptions on grape consignments from Chile (PestID, 2021) suggests that *P. chrysopteris* moves very rarely in that commodity.
Overall Likelihood of Entry	Low		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	Grapes from Chile are likely sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. More than 25% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a large market for grapes from Chile may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, since table grapes are imported only for consumption, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *P. chrysopteris* might be found. Since they lack wings, larvae of *P. chrysopteris* have limited powers of dispersal and thus lack the ability to locate hosts quickly. Moreover, the species has been recorded on a limited number of hosts, which may not be common in the landscape. In the unlikely event that a larva would come into contact with a suitable host to colonize, particularly given the myriad mortality sources in the environment arrayed against early-instar Lepidoptera (Zalucki et al., 2002), the prospects for its survival would likely be bleak. Even if development could be completed in discarded grapes, successful reproduction would be in doubt. Adult *P. chrysopteris* are small moths (wingspan: 20-26 mm; Obraztsov, 1964), and there is no evidence to suggest that they are strong fliers capable of long-distance dispersal. On balance, the above considerations suggest that the pest would have a low probability of encountering hosts and thus, a low likelihood of establishment.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

3.2.11. *Proeulia triquetra* (Lepidoptera: Tortricidae)

Proeulia triquetra is considered to be a secondary or occasional pest in Chile (González, 1989; Bergmann et al., 2016). Feeding by larvae can destroy the leaves, buds, shoots and fruits of grape (González, 1983). Little information is available concerning the life cycle of this species. Two generations per year have been reported (SAG, 2021e).

Defining the Endangered Area for *Proeulia triquetra* within the United States

Climatic suitability	*Proeulia triquetra* has been reported from Chile and Argentina (Brown and Passoa, 1998). In Chile, the moth occurs in Regions VII and VIII (Maule to Biobío) (González, 1989). The distribution corresponds to Plant Hardiness Zones 9 through 10 (Takeuchi et al., 2018), indicating that climatic conditions suitable for survival of the species occur in areas of the continental United States along the West Coast and through much of California, in Arizona, New Mexico, and along the Gulf coast, throughout Florida, in the southern half of Georgia, and along the eastern seaboard as far north as Virginia.
Hosts in PRA Area	Hosts in the PRA area (NRCS, 2021) include **Buddlejaceae:** *Buddleja davidii* (orange eye butterflybush); **Caprifoliaceae:** *Lonicera japonica* (Japanese honeysuckle); **Celastraceae:** *Maytenus boaria* (mayten); **Convolvulaceae:** *Convolvulus arvensis* (field bindweed); **Onagraceae:** *Fuchsia magellanica* (hardy fuchsia); **Rosaceae:** *Malus domestica* (apple), *Prunus cerasifera* (cherry plum), *Rubus occidentalis* (black raspberry); **Rutaceae:** *Citrus reticulata* (tangerine); and **Vitaceae:** *Vitis vinifera* (grape) (Cepeda and Cubillos, 2011).
Economically important hosts at risk[a]	Economically important hosts include apple, grape, and tangerine (NASS, 2020).
Pest potential on economically important hosts at risk	*Proeulia triquetra* is likely to cause unacceptable consequences if introduced into the United States because feeding by larvae can destroy the leaves, buds, shoots and fruits of grape (González, 1983). As noted above, several economically important fruits are hosts of the moth.
Defined Endangered Area	The endangered area encompasses the continental United States within Plant Hardiness Zones 9 through 10 where host plants are present.

[a] As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

Assessing the likelihood of introduction of *Proeulia triquetra* into the endangered area via grapes imported from Chile

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Entry			
Pest prevalence on the harvested commodity	High	Low	Grape is a common host of the moth (González et al., 1973; González, 1983, 1989) and larvae feed on fruit (González, 1983).
Likelihood of surviving post-harvest processing before shipment	High	Moderate	Since the fruit receives no water or detergent bath, inspection and hand-picking serve to locate and remove dirt, debris, damaged berries, and external pests. However, given the nature of grape bunches, which consist of large numbers of tightly packed berries, grape-feeding arthropods, particularly those of small size, that occur on the rachis or pedicel or that feed on or in the berries, could go unnoticed and thus have a significant probability of surviving post-harvest treatment, especially *P. triquetra*, as, according to González (1983), more than one larva per bunch is never found.
Likelihood of surviving transport and storage conditions of the consignment	Medium	Moderate	A total lack of U.S. port interceptions on grape consignments from Chile (PestID, 2021) suggests that *P. triquetra* moves extremely rarely in that commodity.
Overall Likelihood of Entry	Medium		

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	Grapes from Chile likely are sold in every state. However, under the assumption that demand for the fruit is proportional to the size of the consumer population in potential markets, imports might be concentrated more in some regions of the United States than in others, not all of which may be conducive to pest survival. Approximately 24% of the U.S. population lives within the endangered area (Christie et al., 2015), suggesting that a market for grapes from Chile of at least moderate size may exist there. However, there are several factors that would affect establishment. Host availability would be limited for most of the United States when table grapes from Chile are usually shipped (from December to July; winter to early summer in the northern hemisphere) (González, 2021). Hosts, if present, may be in suitable condition (i.e., with new vegetative growth, setting fruit) only during the latter part of that period. Also, since table grapes are imported for consumption only, they would be expected to have only a limited probability of introduction directly into the natural or agricultural environments, in which hosts of *P. triquetra* might be found. Since they lack wings, larvae of *P. triquetra* have limited powers of dispersal and thus, lack the ability to locate hosts quickly. Moreover, the species has been recorded on a limited number of hosts, which may not be common in the landscape. In the unlikely event that a larva would come into contact with a suitable host to colonize, particularly given the myriad mortality sources in the environment arrayed against early-instar Lepidoptera (Zalucki et al., 2002), the prospects for its survival likely would be bleak. Even if development could be completed in discarded grapes, successful reproduction would be in doubt. Adult *P. triquetra* are small moths (wingspan: 15-18 mm; González, 1989); there is no evidence to suggest that they are strong fliers capable of long-distance dispersal. On balance, the above considerations suggest that the pest would have a low probability of encountering hosts and thus, a low likelihood of establishment.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Introduction (combined likelihoods of entry and establishment)	Low		

4. Summary

Of the organisms associated with grapes worldwide and present in the export area, we identified eleven organisms that are quarantine pests for the United States and territories. These pests are likely to meet the threshold for unacceptable consequences in the PRA area and have a reasonable likelihood of following the commodity pathway (Table 3). Thus, these pests are candidates for risk management. These results represent a baseline estimate of the risks associated with the import commodity pathway as described in section 1.4.

Table 3. Summary of pests that met the threshold for unacceptable consequences of introduction, have a reasonable likelihood of following the commodity pathway and thus are candidates for risk management

Pest type	Scientific name	Likelihood of Introduction
Arthropod	*Brevipalpus chilensis* Baker	Medium
	Pseudococcus cribata González	Low
	Pseudococcus meridionalis Prado	Low
	Copitarsia decolora (Guenée)	Low
	Accuminulia buscki Brown	Low
	Bonagota salubricola (Meyrick)	Low
	Chileulia stalactitis (Meyrick)	Low
	Lobesia botrana Denis & Schiffermüller	Medium
	Proeulia auraria (Clarke)	Low
	Proeulia chrysopteris (Butler)	Low
	Proeulia triquetra Obraztsov	Low

Our assessment of risk is contingent on the application of all components of the pathway as described in section 1.4. Appropriate phytosanitary measures to mitigate pest risk are addressed separately from this document.

5. Literature Cited

Aballay, E., and B. Erikss. 2006. Trichodorid nematodes in the Central Area of Chile. Nematologia Mediterranea 34:43-48.

Abou-Awad, B., B. El-Sawaf, A. Reda, and A. Abdel-Khalek. 2000. Environmental management and biological aspects of the two eriophyoid fig mites *Aceria ficus* (Cotte) and *Rhyncaphytoptus ficifoliae* Keifer in Egypt. Anzeiger für Schädlingskunde (Journal of Pest Science) 73(1):5-12.

Agusti-Brisach, C., and J. Armengol. 2013. Black-foot disease of grapevine: an update on taxonomy, epidemiology and management strategies. Phytopathologia Mediterranea 52(2): 245-261.

Al Rwahnih, M., S. Daubert, D. Golino, and A. Rowhani. 2009. Deep sequencing analysis of RNAs from a grapevine showing Syrah decline symptoms reveals a multiple virus infection that includes a novel virus. Virology 387(2):395-401.

Al Rwahnih, M., D. Golino, and A. Rowhani. 2016. First report of *Grapevine Pinot gris virus* infecting grapevine in the United States. Plant Disease 100(5):1030.

Alcalá, P. 1978. Tachinidos parasitos de *Copitarsia turbata* Herr-Schaff en el Valle del Mantaro. Revista Peruana de Entomologia 21(1):126.

Alejandro Rojas, J., J. L. Jacobs, S. Napieralski, B. Karaj, C. A. Bradley, T. Chase, P. D. Esker, L. J. Giesler, D. J. Jardine, and D. K. Malvick. 2017. Oomycete species associated with soybean seedlings in North America—Part I: Identification and pathogenicity characterization. Phytopathology 107(3):280-292.

Alfieri, S. A., C. Wehlburg, K. R. Langdon, and J. W. Kimbrough. 1984. Index of Plant Diseases in Florida (Bulletin 11). Flordia Department of Agriculture & Consumer Services, Gainesville, FL. 389 pp.

Alford, D. V. 2014. Pests of Fruit Crops: a Colour Handbook, Second Edition. CRC Press, Boca Raton, FL. 461 pp.

Angulo, A. O. 2003. *Dichroplus maculipennis* (Blanchard). Universidad de Concepción, Entomologia General Chilena. Last accessed: 9/25/2021 http://www2.udec.cl/entomologia/D-maculipennis.html.

Angulo, A. O., and T. S. Olivares. 2003. Taxonomic update of the species of *Copitarsia* Hampson 1960, (Lepidoptera: Noctuidae: Cuculliinae). Gayana 67(1):33-38.

ARM. 2021. Agricultural Risk Management (ARM) System. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine. Last accessed: 9/28/2021 https://arm.aphis.edc.usda.gov/.

Atanasova, B., M. Jakovljević, D. Spasov, J. Jović, M. Mitrović, I. Toševski, and T. Cvrković. 2015. The molecular epidemiology of bois noir grapevine yellows caused by '*Candidatus* Phytoplasma solani'in the Republic of Macedonia. European Journal of Plant Pathology 142(4):759-770.

Auger, J., M. Esterio, and I. Pérez. 2007. First report of black foot disease of grapevine caused by *Cylindrocarpon macrodidymum* in Chile. Plant Disease 91(4):470.

Auger, J., G. Leal, J. Magunacelaya, and M. Esterio. 2009. *Xiphinema rivesi* from Chile Transmits *Tomato ringspot virus* to Cucumber. Plant Disease 93(9):971.

Auger, J., I. Pérez, C. Osorio-Navarro, and M. Esterio. 2018. First report of *Cadophora luteo-olivacea* causing side rot on kiwifruit in Chile. Plant Disease 102(3):680-680.

Avidov, Z., and I. Harpaz. 1969. Plant pests of Israel. Israel Universities Press, Jerusalem, Israel. 549 pp.

Aylor, D. E., Y. Wang, and D.R. Miller. 1993. Intermittent wind close to the ground within a grass canopy. Boundary-Layer Meteorology 66(4):427-448.

Bahder, B. W., O. Alabi, S. Poojari, D. B. Walsh, and R. A. Naidu. 2013. A survey for grapevine viruses in Washington State 'Concord'(*Vitis*× *labruscana* L.) vineyards. Plant Health Progress 14(1):16.

Baine, Q., C. Looney, D. R. Smith, N. M. Schiff, H. Goulet, and A. J. Redford. 2020. Sawfly GenUS- *Ametastegia*. USDA, Fort Collins, CO. Last accessed 9/7/2021, https://idtools.org/id/sawfly/factsheet.php?name=17479.

Baker, J. 2016. PDIC Factsheets. North Carolina State University Extension, Raleigh, NC. Last accessed: 9/14/2021 https://content.ces.ncsu.edu/giant-willow-aphid.

Baker, J. 2019. Whitefringed Beetles. North Carolina State University, Raleigh, NC. Last accessed 9/10/2021, https://content.ces.ncsu.edu/whitefringed-beetles.

Barriga-Tuñón, J. E. 2009. Coleoptera Neotropical. Curicó, Maule, Chile. Last accessed: 9/10/2021. www.coleoptera-neotropical.org.

Barriga, J. E., T. Curkovic, T. Fichet, J. L. Henríquez, and J. Macaya. 1993. Nuevos antecedentes de Coleópteros Xilófagos y plantas hospederas en Chile, con una recopilación de citas previas. Revista Chilena de entomologia 20:65-91.

Basso, M. F., T. V. M. Fajardo, and P. Saldarelli. 2017. Grapevine virus diseases: Economic impact and current advances in viral prospection and management. Revista Brasileira de Fruticultura 39(1):1-22.

Beard, J. J. 2018. Spider mites of Australia (including key exotic southeast Asian pest species). Queensland Museum, Queensland, Australia. Last accessed 9/8/2021, https://keys.lucidcentral.org/keys/v3/spider_mites_australia/index.html.

Beavers, J. B., H.A. Denmark, and A.G. Selhime. 1972. Predation by *Blattisocius keegani* on egg masses of *Diaprepes abbreviatus* in the laboratory. Journal of Economic Entomology 65(5):1483-1484.

Bellé, C., D. Brum, M. Z. Groth, D. R. Barros, T. E. Kaspary, and J. T. Schafer. 2016. First report of *Meloidogyne luci* parasitizing *Glycine max* in Brazil. Plant Disease 100(10):2174.

Ben-Yehuda, S., M. Shofet, M. Zilberstein, A. Schahaff, and Z. Mendel. 1999. The European grape berry moth *Lobesia botrana* as a pest of deciduous fruit plantations in Israel. Alon Hanotea 53(1):29-37.

Bentancourt, C., M., and I. B. Scatoni. 2006. Lepidopteros de importancia economica en el Uruguay: Reconocimiento, biologia y danos de las plagas agricolas y forestales [Economically important Lepidoptera in Uruguay: Recognition, biology and damage of agricultural and forest pests] (2nd). Editorial Hemisferio Sur, Buenos Aires.

Bentancourt, C. M., I. B. Scatoni, A. González, and J. Franco. 2004. Biology of *Bonagota cranaodes* (Meyrick) (Lepidoptera: Tortricidae) on seven natural foods. Neotropical Entomology 33:299-306.

Bergmann, J., L. Reyes-Garcia, C. Ballesteros, Y. Cuevas, M. F. Flores, and T. Curkovic. 2016. Identification of the female sex pheromone of the leafroller *Proeulia triquetra* Obraztsov (Lepidoptera: Tortricidae). Neotropical Entomology 45(4):351-356.

Berisha, B., Y. D. Chen, G. Y. Zhang, B. Y. Xu, and T. A. Chen. 1998. Isolation of Pierce's disease bacteria from grapevines in Europe. European Journal of Plant Pathology 104:427-433.

Besoain, X., C. Torres, G. A. Díaz, and B. Latorre. 2013. First report of *Neofusicoccum australe* associated with Botryosphaeria canker of grapevine in Chile. Plant Disease 97(1):143-143.

Blackman, R. L., and V. F. Eastop. 2000. Aphids on the World's Crops: An Identification and information Guide (2nd ed.). John Wiley & Sons, Ltd., New York. 466 pp.

Bolland, H. R., J. Gutierrez, and C. H. W. Flechtmann. 1998. World catalogue of the spider mite family (Acari: Tetranychidae). Koninklijke Brill NV, Leiden, Netherlands. 392 pp.

Bournier, A. 1977. Grape insects. Annual Review of Entomology 22(1):353-376.

Bouyahia, H., D. Boscia, V. Savino, P. La Notte, C. Pirolo, M. Castellano, A. Minafra, and G. Martelli. 2005. *Grapevine rupestris stem pitting-associated virus* is linked with grapevine vein necrosis. *Vitis* -Geilweilerhof- 44(3):133.

Bovey, R. 1985. Novel viruses and virus diseases of grapevine, new data on known diseases and their agents. Phytopathologia Mediterranea 24(1/2):8-11.

Briceño, E., and B. Latorre. 2007. Outbreaks of Cladosporium rot associated with delayed harvest wine grapes in Chile. Plant Disease 91(8):1060-1060.

Brncic, D. 1970. Studies on the evolutionary biology of Chilean species of *Drosophila*. Pages 401-436 Essays in evolution and genetics in honor of Theodosius Dobzhansky. Springer.

Brown, J. W. 1999. A new genus of Tortricid moths (Tortricidae: Euliini) injurous to grapes and stone fruits in Chile. Journal of the Lepidopterists' Society 53(2):60-64.

Brown, J. W. 2005. World Catalogue of Insects. Vol. 5. Tortricidae (Lepidoptera). Apollo Books, Stenstrup, Denmark. 741 pp.

Brown, J. W. 2006. Scientific names of pest species in Tortricidae (Lepidoptera) frequently cited erroneously in the entomological literature. American Entomologist 52(3):182-189.

Brown, J. W., and S. Passoa. 1998. Larval foodplants of Euliini (Lepidoptera: Tortricidae): from *Abies* to *Vitis*. Pan-Pacific Entomologist 74(1):1-11.

Brown, J. W., G. Robinson, and J. A. Powell. 2008. Food plant database for the leafrollers of the world (Lepidoptera: Tortricidae), ver. 1. Last accessed: 9/10/2021. http://www.tortricidae.com/foodplants.asp.

Browning, T. O. 1959. The long-tailed mealybug, *Pseudococcus adonidum* (L.), in South Australia. Australian Journal of Agricultural Research 10(3):322-339.

Butin, H., and H. L. Peredo. 1986. Hongos parásitos en coníferas de América del Sur, con especial referencia a Chile. Bibliotheca Mycologica, vol. 101. Lubrecht & Cramer ltd. 100p

CABI. 2021. Centre for Agriculture and Biosciences International. Wallingford, UK: CAB International. Last accessed 9/30/2021. CABI.org.

CABI/EPPO. 2012. *Lobesia botrana* Denis & Schiffermüller (70, 2nd revision). CABI Head Office, Wallingford, U.K.

Campos, S. L., M. M. A. Faccin, L. N. Echeverria, and R. L. Sazo. 1981. Distribution and development cycle of the grapevine leaf-rolling tortricid *Proeulia auraria* (Clarke) [Abstract]. Agricultura Tenica 41(4):249-256.

Capinera, J. L. (ed.). 2008. Encyclopedia of Entomology (2nd ed.). Springer, Dordrecht. 4346 pp.

Carneiro, R. M., V. R. Correa, M. R. A. Almeida, A. C. M. Gomes, A. M. Deimi, P. Castagnone-Sereno, and G. Karssen. 2014. *Meloidogyne luci* n. sp. (Nematoda: Meloidogynidae), a root-knot nematode parasitising different crops in Brazil, Chile, and Iran. Nematology 16(3):289-301.

Carneiro, R. M. D. G., O. Randig, M. R. A. Almeida, and A. C. M. M. Gomes. 2004. Additional information on *Meloidogyne ethiopica* Whitehead, 1968 (Tylenchida: Meloidogynidae), a root-knot nematode parasitising kiwi fruit and grape-vine from Brazil and Chile. Nematology 6(1):109-123.

Casieri, L., V. Hofstetter, O. Viret, and K. Gindro. 2009. Fungal communities living in the wood of different cultivars of young *Vitis vinifera* plants. Phytopathologia Mediterranea 48(1):73-83.

Castro, D., J. Espinosa, and M. Vargas. 2004. Ionising radiation as a quarantine treatment for controlling *Brevipalpus chilensis* (Acarina: Tenuipalpidae) in Thompson Seedless grapes. International Atomic Energy Agency Technical Documents (1427):143-153.

Castro, R. 1998. Determinación de enfermedades de naturaleza viral en cultivo de tomate (*Licopersicon esculentum* Mill.) en la VII región de Chile. Agro-Ciencia 14:289-292.

Cepeda, D. E. 2014. Descripción del último estado larvario de *Accuminulia buscki*, especie de Tortricidae (Lepidoptera: Euliini) de importancia económica en Chile. Revista Chilena de Entomologia 39:23-27.

Cepeda, D. E., and G. E. Cubillos. 2011. Descripción del último estado larvario y recopilación de registros de hospederos de siete especies de Tortrícidos de importancia económica en Chile (Lepidoptera: Tortricidae). Gayana 75(1):39-70.

Chambon, J.-P., C. Basso, and I. B. Scatoni. 1997. Présence de *Bonagota cranaodes* (Meyrick) en Uruguay (Lep., Tortricidae). Bulletin de la Société entomologique de France 102(5):455-456.

Charles, J. G., K.J. Froud, R. van den Brink, and D.J. Allan. 2009. Mealybugs and the spread of grapevine leafroll-associated virus 3 (GLRaV-3) in a New Zealand vineyard. Australasian Plant Pathology 38(6):576-583.

Checa, J. 2004. Dothideales dictiospóricos/Dictyosporic Dothideales. Nova Hedwigia 79:3-4.

Christie, D., D. Borchert, and R. Magarey. 2015. Plant Hardiness Zones of the United States: Area and Population Analysis. Raleigh, NC: USDA-APHIS, PPQ, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory.

Ciesla, W. M. 2000. Exotic Forest Pest Information System for North America: *Callideriphus laetus*. North American Forest Commission. Last accessed: 9/10/2021. http://spfnic.fs.fed.us/exfor/data/pestreports.cfm?pestidval=29&langdisplay=english.

Çobanoğlu, S. 1995. Türkiye'den bazı Tarsonemidae (Acarina, Prostigmata) türleri. Turkish Journal of Entomology 19(2):87-94.

Connell, W. A. 1977. A key to *Carpophilus* sap beetles associated with stored foods in the United States (Coleoptera: Nitidulidae). Cooperative Plant Pest Report 2(23):398-404.

Cooper, M., M. Hobbs, B. Strode, and L. Varela. 2020. Grape erineum mite: Postharvest sulfur use reduces subsequent leaf blistering. California Agriculture 74(2):94-100.

Cordo, H. A., G. Logarzo, K. Braun, and O. Di Iorio (eds.). 2004. Catalogo de Insectos Fitofagos de la Argentina y sus Plantas Asociadas. [Catalog of Phytofagous Insects of Argentina and their Associated Plants]. Sociedad Entomologica Argentina, Buenos Aires. 734 pp.

Correa, M., J. Germain, T. Malausa, and T. Zaviezo. 2012. Molecular and morphological characterization of mealybugs (Hemiptera: Pseudococcidae) from Chilean vineyards. Bulletin of Entomological Research 102(5):524-530.

Correa, M. C., E. Lombaert, T. Malausa, D. Crochard, A. Alvear, T. Zaviezo, and F. Palero. 2015. Mealybug species from Chilean agricultural landscapes and main factors influencing the genetic structure of *Pseudococcus viburni*. Scientific reports 5(1):1-10.

Costa, H. S., T. R. Pinckard, C. Gispert, R. Hernandez-Martinez, C. K. Dumenyo, and D. A. Cooksey. 2004. Plant hosts of *Xylella fastidiosa* in and near southern California vineyards. Plant Disease 88:1255-1261.

Crous, P. W., W. Gams, M. J. Wingfield, and P. Van Wyk. 1996. *Phaeoacremonium* gen. nov. associated with wilt and decline diseases of woody hosts and human infections. Mycologia 88(5):786-796.

Cruz A, M. 2004. Enfermedades de la vid en el secano interior de la VII y VIII regiones de Chile: Manejo integrado. Instituto de Investigaciones Agropecuarias, Centro Regional de Investigaciones Quilamapu, Chillan, Chile.

Curkovic, T., M. Durán, and C. Ferrera. 2013. Control of *Brevipalpus chilensis* Baker (Acari: Tenuipalpidae) with agricultural detergents under laboratory and field conditions. Chilean Journal of Agricultural & Animal Sciences, ex Agro-Ciencia 29(1):73-82.

Curkovic, T., C. Ferrera, C. Baginsky, and O. S. Seguel. 2018. Effect of infestation by *Micrapate scabrata* (Erichson, 1847) (Coleoptera: Bostrichidae) on wood degradation and its impacts on some soil chemistry properties. Gayana 82(1):1-7.

da Silva-Torres, C. S. A., M.D. de Oliveira, and J.B. Torres. 2013. Host selection and establishment of striped mealybug, *Ferrisia virgata*, on cotton cultivars. Phytoparasitica 41(1):31-40.

da Silva, V. C. P., M. B. Kaydan, T. Malausa, J.-F. Germain, F. Palero, and M. Botton. 2017. Integrative taxonomy methods reveal high mealybug (Hemiptera: Pseudococcidae) diversity in southern Brazilian fruit crops. Scientific reports 7(1):1-9.

Damm, U., P. Cannon, J. Woudenberg, and P. Crous. 2012. The *Colletotrichum acutatum* species complex. Studies in Mycology 73:37-113.

de Borbon, C. M., O. Gracia, and R. Piccolo. 2006. Relationships between Tospovirus Incidence and Thrips Populations on Tomato in Mendoza, Argentina. Journal of Phytopathology 154:93-99.

Dekle, G. W. 2017. *Cornu aspersum* (EENY-240). Featured creatures:1-7. Last accessed 9/13/2021, http://entnemdept.ufl.edu/creatures/misc/gastro/brown_garden_snail.htm.

Denman, S., P. W. Crous, J. Groenewald, B. Slippers, B. D. Wingfield, and M. J. Wingfield. 2003. Circumscription of *Botryosphaeria* species associated with Proteaceae based on morphology and DNA sequence data. Mycologia 95(2):294-307.

Díaz, G., and B. Latorre. 2018. First report of cordon dieback of kiwifruits caused by *Diaporthe ambigua* and *D. australafricana* in Chile. Plant Disease 102(2):446.

Díaz, G. A., J. Auger, X. Besoain, E. B. Schwarze, and B. A. Latorre. 2013. Prevalence and pathogenicity of fungi associated with grapevine trunk diseases in Chilean vineyards. Ciencia e investigación agraria: revista latinoamericana de ciencias de la agricultura 40(2):327-339.

Díaz, G. A., B. A. Latorre, M. Lolas, E. Ferrada, P. Naranjo, and J. P. Zoffoli. 2017. Identification and characterization of *Diaporthe ambigua, D. australafricana, D. novem,* and *D. rudis* causing a postharvest fruit rot in kiwifruit. Plant Disease 101(8):1402-1410.

Díaz, G. A., M. Lolas, E. Ferrada, B. Latorre, and J. Zoffoli. 2016. First report of *Cadophora malorum* associated with cordon dieback in kiwi plants in Chile. Plant Disease 100(8):1776.

Dissanayake, A., A. Phillips, X. Li, and K. Hyde. 2016. *Botryosphaeriaceae*: Current status of genera and species. Mycosphere 7(7):1001-1073.

Dupont, J., S. Magnin, C. Cesari, and M. Gatica. 2002. ITS and β-tubulin markers help delineate *Phaeoacremonium* species, and the occurrence of *P. parasiticum* in grapevine disease in Argentina. Mycological Research 106(10):1143-1150.

Elfar, K., J. P. Zoffoli, and B. A. Latorre. 2018. Identification and characterization of *Alternaria* species associated with moldy core of apple in Chile. Plant Disease 102(11):2158-2169.

Elgueta, M., M. Daccordi, and S. Zoia. 2017. Lista de las espécies de Spilopyrinae y Eumolpinae (Coleoptera: Chrysomelidae) de Chile. Boletín del Museo Nacional de Historia Natural, Chile 66(1):67-84.

Engel, E., P. Escobar, C. Montt, S. Gómez-Talquenca, and P. Valenzuela. 2008. First report on the occurrence of Grapevine leafroll-associated virus 7 and 9 in Chilean grapevines. Plant Disease 92(8):1252.

Engel, E., P. Rivera, and P. Valenzuela. 2010. First report of Grapevine Syrah virus-1 in Chilean grapevines. Plant Disease 94(5):633-633.

EPPO. 2021. EPPO Global Database. Last accessed 9/9/2021, gd.eppo.int/.

Erwin, D. C., and O. K. Ribeiro. 1996. *Phytophthora* Diseases Worldwide. American Phytopathological Society, St. Paul, MN. 562 pp.

Espinoza, J. G., E. X. Briceño, L. M. Keith, and B. A. Latorre. 2008. Canker and twig dieback of blueberry caused by *Pestalotiopsis* spp. and a *Truncatella* sp. in Chile. Plant Disease 92(10):1407-1414.

Essakhi, S., L. Mugnai, P. Crous, J. Groenewald, and G. Surico. 2008. Molecular and phenotypic characterisation of novel *Phaeoacremonium* species isolated from esca diseased grapevines. Persoonia: Molecular Phylogeny and Evolution of Fungi 21:119-134.

Essig Museum Online Database. 2021. Essig Museum of Entomology. University of California, Berkeley, CA. Last accessed 9/9/2021, essigdb.berkeley.edu/.

Etienne, J. 1972. The main injurious Trypetids in Reunion Island. Annales de la Societe Entomologique de France 8(2):485-491.

Evans, G. A. 2008. The whiteflies (Hemiptera: Aleyrodidae) of the world and their host plants and natural enemies (v. 2008-09-23). United States Department of Agriculture (USDA), Animal Plant Health Inspection Service (APHIS). 715 pp.

Ewing, H. E. 1939. A revision of the mites of the subfamily Tarsoneminae of North America, the West Indies, and the Hawaiian Islands, USDA, Division of Insect Identification, Technical Bulletin No. 653, Washington, D.C.

Farr, D. F., and A. Y. Rossman. 2021. Fungal Databases, U.S. National Fungus Collections. ARS, USDA. Last accessed: 9/28/2021. https://nt.ars-grin.gov/fungaldatabases/.

FAVIR. 2021. Fruits and Vegetables Import Requirements- grape (cluster of fruit; fruit) from Chile into all ports. United States Department of Agriculture. Animal and Plant Health Inspection Service. Last accessed: 9/29/2021. epermits.aphis.usda.gov/.

Fermaud, M., and R. Le Menn. 1989. Association of *Botrytis cinerea* with Grape Berry Moth Larvae. Phytopathology 79:351-356.

Fermín M. Alfaro, Jaime Pizarro-Araya, Luis Letelier, and J. Cepeda-Pizarro. 2013. Distribución geográfica de los ortópteros (Insecta: Orthoptera) presentes en las provincias biogeográficas de Atacama y Coquimbo (Chile). Revista de Geografía Norte Grande 56:235-250.

Ferris, H. 2014. Nemabase: *Meloidogyne luci*. Department of Nematology, University of California, Davis. Last accessed: 9/20/2021. http://ipm.ucanr.edu/NEMABASE/

Fiore, N., S. Prodan, J. Montealegre, E. Aballay, A. Pino, and A. Zamorano. 2008. Survey of grapevine viruses in Chile. Journal of Plant Pathology:125-130.

Fiore, N., A. Zamorano, A. Pino, F. González, I. Rosales, J. A. Sánchez-Navarro, and V. Pallás. 2016. Survey of stone fruit viruses and viroids in Chile. Journal of Plant Pathology:631-635.

Flores, M. F., J. Bergmann, C. Ballesteros, D. Arraztio, and T. Curkovic. 2021. Development of monitoring and mating disruption against the Chilean leafroller *Proeulia auraria* (Lepidoptera: Tortricidae) in orchards. Insects 12(7): 625.

Francois, C. L. 2020. Morphology and Physiology of Larval Color Variation in the White-Lined Sphinx Moth, *Hyles lineata* (doctoral dissertation, The University of Arizona).

French, A. M. 1989. California Plant Disease Host Index. California Department of Food and Agriculture, Division of Plant Industry, Sacramento, California. 394 pp.

French, J. M., R. A. Stamler, J. J. Randall, and N. P. Goldberg. 2011. First report of *Phytophthora nicotianae* on bulb onion in the United States. Plant Disease 95(8):1028.

Gajardo, A., N. Fiore, S. Prodan, S. Paltrinieri, S. Botti, A. Pino, A. Zamorano, J. Montealegre, and A. Bertaccini. 2009. Phytoplasmas associated with grapevine yellows disease in Chile. Plant Disease 93(8):789-796.

Gams, W., and P. W. Crous. 2000. "*Phaeomoniella chlamydospora*" Gen. et Comb. Nov., a Causal Organism of Petri Grapevine Decline and Esca. Phytopathologia Mediterranea 39:112-118.

García Morales M, D. B., Miller DR, Miller GL, Ben-Dov Y, Hardy NB. 2016. ScaleNet: A literature-based model of scale insect biology and systematics. USDA, Hardy Lab, UMASS Amherst, Amherst, Mass. Last accessed 9/28/2021, http://scalenet.info.

Gertsson, C.-A. a. C. H. 2015. Coccoidea (scale insects). Pages 132-147 *in* N. P. K. J. Böcher, T. Pape, and L. Vilhelmsen, (ed.). The Greenland Entomofauna: An Identification Manual of Insects, Spiders and Their Allies. Koninklijke Brill NV., Leiden, Netherlands.

Gilligan, T. M., and M. E. Epstein. 2014. TortAI, Tortricids of Agricultural Importance to the United States (Lepidoptera: Tortricidae). Identification Technology Program (ITP), USDA/APHIS/PPQ/CPHST, Fort Collins, CO. Last accessed 9/25/2021, http://idtools.org/id/leps/tortai/.

Golino, D. A. 1993. Pierce's disease. In G. P. Martelli (Ed.), Graft-transmissible diseases of grapevines: Handbook for detection and diagnosis. Food & agriculture Org.

Gomez Tovar, J. 1972. Moscas minadoras en el cultivo de la haba, (*Vicia faba* L.) En la Sierra central del Peru. Revisita Peruana de Entomologia 15(2):239-243.

González, R. H. 1983. Manejo de plagas de la vid. Universidad de Chile Facultad de Ciencias Agrarias, Veterinarias y Forestales, Santiago, Chile. 115 pp.

González, R. H. 1989. Insectos y acaros de importancia agrícola y Cuarentenaria en Chile. Universidad de Chile, Facultad de Ciencias Agrarias y Forestales. Santiago.

González, R. H. 2011. Pseudocóccidos de Importancia Frutícola en Chile (Hemiptera: Pseudococcidae). Universidad de Chile Facultad de Ciencias Agronómicas, Santiago.

González, R. H., P. V. Arretz, and L. E. Campos. 1973. Catálogo de las plagas agrícolas de Chile. Pages 1-68 *in* Publicacion en Ciencias Agricolas No. 2. Universidad de Chile Facultad de Agronomia.

González, R. H., and E. Prado. 2012. New synonymy for a species of mealybug in the genus *Pseudococcus* (Hemiptera: Pseudococcidae) that occurs on fruit trees in Chile. Zootaxa 3230. pp.67

González, R. H. 1958. Biologia y control de la falsa arañita de la vid: *Brevipalpus chilensis* Baker (Acarina, Phytoptipalpidae). Universidad de Chile Estación Experimental Agronómica, Maipú. 31p.

González, S. 2021. Fresh deciduous fruit semi-annual: Chile (Report number: CI2021-0009). Last accessed: 9/30/2021. fas.usda.gov/data/chile-fresh-deciduous-fruit-semi-annual-5.

González, V., and M. L. Tello. 2011. The endophytic mycota associated with *Vitis vinifera* in central Spain. Fungal Diversity 47(1):29-42.

Goodey, J. B., M. T. Franklin, and D. J. Hooper. 1965. T. Goodey's the nematode parasites of plants catalogued under their hosts (3rd. ed.). Commonwealth Agricultural Bureaux, Farnham Royal, England. 183 pp.

Gordh, G., and S. McKirdy (eds.). 2014. The handbook of plant biosecurity: principles and practices for the identification, containment and control of organisms that threaten agriculture and the environment globally. Springer. Dordrecht, Netherlands. 723 pp.

Gould, J., R. Venette, and R. Simmons. 2013. *Copitarsia* spp.: Biology and risk posed by potentially invasive Lepidoptera from South and Central America. Pages 160-182 *in* J. Peña, (ed.). Potential Invasive Pests of Agricultural Crops. CAB International, Wallingford, UK.

Gramaje, D., L. Mostert, J. Z. Groenewald, and P. W. Crous. 2015. *Phaeoacremonium*: from esca disease to phaeohyphomycosis. Fungal Biology 119(9):759-783.

Grasswitz, T. R. a. D. G. J. 2008. Movement of grape mealybug, *Pseudococcus maritimus*, on and between host plants. Entomologia Experimentalis et Applicata 129(3):268-275.

Greathead, D. J. 1990. Crawler behaviour and dispersal. Pages 305-308 *in* D. Rosen, (ed.). Armored Scale Insects: Their Biology, Natural Enemies and Control (World Crop Pests Vol. 4A). Elsevier Science Publishers B.V., Amsterdam.

Grinbergs, D., J. Chilian, and A. France. First report of *Seimatosporium vitifusiforme* causing trunk disease in Chilean grapevines (*Vitis vinifera*). Plant Disease: PDIS-11-20-2475-PDN.

Guajardo, J., N. Riquelme, L. Tapia, A. Larach, C. Torres, R. Camps, and X. Besoain. 2018. First report of *Lasiodiplodia theobromae* causing bot gummosis in *Citrus limon* in Chile. Plant Disease 102(4):818.

Guajardo, J., S. Saa, N. Riquelme, G. Browne, C. Youlton, M. Castro, and X. Besoain. 2019. Characterization of oomycete species associated with root and crown rot of english walnut in Chile. Plant Disease 103(4):691-696.

Guerrero Contreras, J., R. Galdames Gutierrez, K. Ogass Contreras, and S. Pérez Fuentealba. 2020. First report of *Diaporthe foeniculina* causing black tip and necrotic spot on hazelnut kernel in Chile. Plant Disease 104(3):975.

Gullan, P. J., Kosztarab, M. 1997. Adaptations in scale insects. Annual Review of Entomology 42(1):23-50.

Hadidi, A., R. Flores, J. W. Randles, and P. Palukaitis. 2017. Viroids and Satellites. Elsevier, Academic Press. UK. 716 pp.

Hamon, A. B., and T. R. Fasulo. 2020. Featured Creatures: cottony cushion scale. University of Florida, Gainesville, FL. Last accessed 9/28/2021. https://entnemdept.ufl.edu/creatures/fruit/cottony_cushion_scale.htm.

Hamon, A. B., and G. J. Mason. 2020. Featured Creatures: fig wax scale. University of Florida; Division of Plant Industry. Last accessed: 9/27/2021 entnemdept.ufl.edu/creatures/orn/scales/fig_wax_scale.htm.

Handoo, Z., A. Skantar, L. Carta, and D. Schmitt. 2005. Morphological and molecular evaluation of a *Meloidogyne hapla* population damaging coffee (*Coffea arabica*) in Maui, Hawaii. Journal of Nematology 37(2):136-145.

Handoo, Z. A. 2021. USDA Nematode collection. Beltsville, MD: USDA ARS Nematology Laboratory, Plant Sciences Institute. Last accessed: 9/20/2021. nt.ars-grin.gov/nematodes/search.cfm.

Hennessey, M. K., J. E. Peña, M. Zlotina, and K. Santos. 2013. Likelihood of disperal of the armored scale, *Aonidiella orientalis* (Hemiptera: Diaspididae), to avocado trees from infested fruit discarded on the ground, and observations on spread by handlers. Pages 401-411 *in* J. E. Peña, (ed.). Potential Invasive Pests of Agricultural Crops. CAB International, Wallingford, U.K.

Herrera, M., and V. Madariaga. 2001. Presencia e incidencia de virus de la vid en la zona central de Chile (Presence and incidence of grapevine viruses in the central zone of Chile). Agricultura Técnica 61:393-400.

Heu, R. 2007. Distribution and host records of agricultural pests and other organisms in Hawaii. Hawaii Department of Agriculture, Plant Industry Division, Plant Pest Control Branch, Survey Program, Honolulu, HI. 71 pp.

Hill, D. S. 1983. Agricultural Insect Pests of the Tropics and Their Control (2nd ed.). Cambridge University Press, New York. 746 pp.

Hill, D. S. 1987. Agricultural Insect Pests of Temperate Regions and Their Control. Cambridge University Press. 659 pp.

Hoffman, C. J., T. J. Dennehy, and J. P. Nyrop. 1992. Phenology, monitoring, and control decision components of the grape berry moth (Lepidoptera: Tortricidae) risk assessment program in New York. Journal of Economic Entomology 85(6):2218-2227.

Hopkins, G. H. E. 1927. Pests of economic plants in Samoa and other island groups. Bulletin of Entomological Research 18(1):23-32.

Hrustić, J., G. Delibašić, I. Stanković, M. Grahovac, B. Krstić, A. Bulajić, and B. Tanović. 2015. *Monilinia* spp. causing brown rot of stone fruit in Serbia. Plant Disease 99(5):709-717.

Hurtrel, B., and D. Thiéry. 1999. Modulation of flight activity in *Lobesia botrana* Den. & Schiff. (Lepidoptera: Tortricidae) females studied in a wind tunnel. Journal of Insect Behavior 12(2):199-211.

IPPC. 2017a. International Standards for Phytosanitary Measures, Publication No. 11: Pest Risk Analysis for Quarantine Pests. Food and Agriculture Organization of the United Nations, Secretariat of the International Plant Protection Convention (IPPC), Rome, Italy. 36 pp.

IPPC. 2017b. International Standards for Phytosanitary Measures, Publication No. 4: Requirements for the establishment of pest free areas. Food and Agriculture Organization of the United Nations, Secretariat of the International Plant Protection Convention (IPPC), Rome, Italy.

IPPC. 2019. International Standards for Phytosanitary Measures, Publication No. 5: Glossary of Phytosanitary Terms. Food and Agriculture Organization of the United Nations, Secretariat of the International Plant Protection Convention (IPPC), Rome, Italy. 35 pp.

Jara, C., Flores, S., Pino, L., Cristina Medina, M., Eduardo Alvarez, Del Pino, F., and Godoy-Herrera, R. 2014. The natural breeding sites of *Drosophila funebris* in Chile. *Drosophila* information services. 97:75.

Jaspars, E. M. J., and L. Bos. 1980. Descriptions of Plant Virus. Alfalfa mosaic virus (N. 229). Association of Applied Biologists.

Jayawardena, R. S., W. Purahong, W. Zhang, T. Wubet, X. Li, M. Liu, W. Zhao, K. D. Hyde, J. Liu, and J. Yan. 2018. Biodiversity of fungi on *Vitis vinifera* L. revealed by traditional and high-resolution culture-independent approaches. Fungal diversity 90(1):1-84.

Jediyi, H., K. Naamani, A. A. Elkoch, and N. Lemjiber. 2019. Changes in grapes composition during ripening of five *Vitis vinifera* L varieties as related to Tephritidae and Drosophilidae infestations. Physiology and Molecular Biology of Plants 25(6):1407-1418.

Jeppson, L. R., H. H. Keifer, and E. W. Baker. 1975. Mites Injurious to Economic Plants. University of California Press, Berkeley and Los Angeles. 704p.

Jones, T. J., N. A. Rayapati, and M. Nita. 2015. Occurrence of *Grapevine leafroll associated virus*-2,− 3 and *Grapevine fleck virus* in Virginia, USA, and factors affecting virus infected vines. European Journal of Plant Pathology 142(2):209-222.

Ju, Y.-M., J. D. Rogers, F. San Martin, and A. Granmo. 1998. The genus *Biscogniauxia*. Mycotaxon (USA) 66. 98p.

Jung, T., A. Durßn, E. Sanfuentes von Stowasser, L. Schena, S. Mosca, S. Fajardo, M. Gonzßlez, A. D. Navarro Ortega, J. Bakonyi, and D. Seress. 2018. Diversity of *Phytophthora* species in Valdivian rainforests and association with severe dieback symptoms. Forest Pathology 48(5):19p.

Klein Koch, C., and D. F. Waterhouse. 2000. The distribution and importance of arthropods associated with agriculture and forestry in Chile. Australian Centre for International Agricultural Research, Canberra. 234 pp.

Lamborot, L., M. Guerrero, and J. Araya. 1999. Lepidopteros asociados al cultivo de la quinoa (*Chenopodium quinoa* Willdenow) en la zona central de Chile. Boletin de Sanidad vegetal plagas 25:203-207.

Larraín S., P. 1996. Biology of *Copitarsia turbata* (Lep. Noctuidae) under controlled conditions. Agricultura Tecnica (Chile) 56(3):220-223.

Latorre, B., G. Díaz, A. Valencia, P. Naranjo, E. Ferrada, R. Torres, and J. Zoffoli. 2014. First report of *Monilinia fructicola* causing brown rot on stored Japanese plum fruit in Chile. Plant Disease 98(1):160-160.

Latorre, B., and M. Guerrero. 2001. First report of shoot blight of grapevine caused by *Sclerotinia sclerotiorum* in Chile. Plant Disease 85(10):1122.

Latorre, B., M. Rioja, and W. Wilcox. 2001. *Phytophthora* species associated with crown and root rot of apple in Chile. Plant Disease 85(6):603-606.

Lawrence, D. P., R. Travadon, and K. Baumgartner. 2015. Diversity of *Diaporthe* species associated with wood cankers of fruit and nut crops in northern California. Mycologia 107(5):926-940.

Lawrence, D. P., R. Travadon, and K. Baumgartner. 2018. Novel *Seimatosporium* species from grapevine in Northern California and their interactions with fungal pathogens involved in the trunk-disease complex. Plant Disease 102(6):1081-1092.

Lenné, J. M. 1990. A World List of Fungal Diseases of Tropical Pasture Species (Phytopathological Papers No. 31). CAB International, Wallingford, UK. 162 pp.

Liblikas, I. 2004. Syntheses and Behaviour Activity of Conjugated Polyenic Pheromone Components (Doctoral dissertation), Royal Institute of Technology, Stockholm, Sweden.

Linaldeddu, B., A. Deidda, B. Scanu, A. Franceschini, A. Alves, J. Abdollahzadeh, and A. Phillips. 2016. Phylogeny, morphology and pathogenicity of *Botryosphaeriaceae, Diatrypaceae* and *Gnomoniaceae* associated with branch diseases of hazelnut in Sardinia (Italy). European Journal of Plant Pathology 146(2):259-279.

Lindquist, E. E. 1978. On the synonymy of *Tarsonemus waitei* Banks, *T. setifer* Ewing, and *T. bakeri* Ewing, with redescription of species (Acari: Tarsonemidae). The Canadian Entomologist 110(10):1023-1048.

Lombard, L., G. van Leeuwen, V. Guarnaccia, G. Polizzi, P. van Rijswick, K. Rosendahl, J. Gabler, and P. Crous. 2014. Diaporthe species associated with *Vaccinium*, with specific reference to Europe. Phytopathologia Mediterranea 53(2):287-299.

López-Pérez, A., M. Arias, and A. Bello. 2001. Trichodoridae (Nematoda: Triplonchida) in Spain. Nematology 3(5):403-409.

Lowery, D. T. 2020. 5.3 Insect & Mite Pests of Grape. Best Practises Guide. British Columbia Grapegrower's Association, Penticton, BC.

Lynch, S., P. Zambino, T. Scott, and A. Eskalen. 2014. Occurrence, incidence and associations among fungal pathogens and *Agrilus auroguttatus*, and their roles in *Quercus agrifolia* decline in California. Forest Pathology 44(1):62-74.

Maison, P., and P. Pargade. 1967. Le piegeage sexuel de l'Eudémis au service de l'avertissement agricole. Phytoma (19):9-13.

Maldonado-González, M. M., M. del Pilar Martínez-Diz, M. Andrés-Sodupe, R. Bujanda, E. Díaz-Losada, and D. Gramaje. 2020. Quantification of *Cadophora luteo-olivacea* from grapevine nursery stock and vineyard soil using droplet digital PCR. Plant Disease 104(8):2269-2274.

Mammella, M. A., F. N. Martin, S. O. Cacciola, M. D. Coffey, R. Faedda, and L. Schena. 2013. Analyses of the population structure in a global collection of *Phytophthora nicotianae* isolates inferred from mitochondrial and nuclear DNA sequences. Phytopathology 103(6):610-622.

Mani, M., C. Shivaraju, and M. S. Rao. 2014. Pests of grapevine: A worldwide list. Pest Management in Horticultural Ecosystems 20(2):170-216.

Mani, M. and C. Shivaraju. 2016. Biology. Pages 87-106 *in* M. Mani and C. Shivaraju, (eds.). Mealybugs and Their Management in Agricultural and Horticultural Crops. Springer, New Delhi: India.

Manosalva, L., L. Parra, A. Aguilera, and R. Rebolledo. 2011. Preliminary list of thrips in ornamental plants and weeds in the region of La Araucanía, Chile. Idesia 29(3):105-108.

Martelli, G. P. 2014. Directory of virus and virus-like diseases of grapevine and their agents. Journal of Plant Pathology 96(1S):1-136.

Martelli, G. P., M. Conti, and A. Minafra. 2001a. Descriptions of Plant Virus. Grapevine virus A (383). Association of Applied Biologists.

Martelli, G. P., P. Saldarelli, and A. Minafra. 2011. Descriptions of Plant Virus. Grapevine leafroll-associated virus 3 (422). Association of Applied Biologists.

Martelli, G. P., B. Walter, and L. Pinck. 2001b. Descriptions of Plant Virus. Grapevine fanleaf virus (385). Association of Applied Biologists.

Medina, C., J. Matus, C. San-Martín, P. Arce-Johnson, and M. Z. Zúñiga. 2006. Occurrence and distribution of viruses in commercial plantings of *Rubus*, *Ribes* and *Vaccinium* species in Chile. International Journal of Agriculture and Natural Resources 33(1):19-24.

Migeon, A., and F. Dorkeld. 2021. Spider Mites Web: a comprehensive database for the Tetranychidae. Last accessed 9/9/2021. 1.montpellier.inra.fr/CBGP/spmweb.

Miller, C. E. 1995. Results of the 1994/95 Chilean Grape Survey (internal report). USDA-APHIS, Planning & Risk Analysis Systems, Policy & Program Development. Riverdale, MD.

Miller, D. R., V. L. Blackburn, J. A. Davidson, and W. F. Gimpel, Jr. 1985. Pest risk assessment of armored scales on certain fruit [report submitted to USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine]. United States Department of Agriculture (USDA), Agricultural Research Service, Beltsville, MD. 35 pp.

Monti, M. M., M. Ruocco, E. Grobbelaar, and P. A. Pedata. 2020. Morphological and Molecular Characterization of *Lema bilineata* (Germar), a New Alien Invasive Leaf Beetle for Europe, with Notes on the Related Species *Lema daturaphila* Kogan & Goeden. Insects 11(295):1-16.

Morales, R., and J. Monis. 2007. First Detection of *Grapevine leafroll associated virus-7* in California Vineyards. Plant Disease 91(4):465-465.

Morandi, W. J., Pacheco-da-Silva, V.C., Willink, M.C., Prado, E. and Botton, M. 2015. A survey of mealybugs infesting South-Brazilian wine vineyards. Revista Brasileira de Entomologia 59:251-254.

Moreno Fajardo, O. L., and F. J. Serna Cardona. 2006. Biología de *Copitarsia decolora* (Lepidoptera: Noctuidae: Cuculliinae), en flores cultivadas del híbrido comercial de *Alstroemeria* spp. Revista Facultad Nacional de Agronomía Medellín; Vol. 59 (1).

Morrone, J. J. 1999. The species of Entiminae (Coleoptera: Curculionidae) ranged in America south of the United States. Anales del Instituto de Biología. Serie Zoología 70(2):99-168.

Moya, E. 2013. *Fusarium* crown rot disease: biology, interactions, management and function as a possible sensor of global climate change. Ciencia e investigación agraria: revista latinoamericana de ciencias de la agricultura 40(2):235-252.

Mujica, F., and E. Oehrens. 1967. Segunda addenda a flora fungosa Chilena (Boletin Tecnico No. 27). Universidad de Chile, Facultad de Agronomia, Maipú, Chile. 81 pp.

Mujica, F., and C. Vergara. 1945. Flora fungosa chilena, índice preliminar de los huéspedes de los hongos chilenos y sus referencias bibliográficas (1st ed). Ministerio de Agricultura. Santiago, Chile: Imprenta Stanley.

Murant, A. F. 1970. Descriptions of Plant Virus. Arabis mosaic virus (DPV 16). Association of Applied Biologists. Last accessed: 9/10/2021. dpvweb.net/dpv/showdpv/?dpvno=16

NASS. 2020. National Agricultural Statistics Services- 2020. U.S. Government Printing Office, Washington, D.C.

NHM. 2021. HOSTS - a Database of the World's Lepidopteran Hostplants. The Natural History Museum. Last accessd: 9/21/2021. nhm.ac.uk/our-science/data/hostplants/search/index.dsml.

NIS. 2008. Change in action status for armored scales (Hemiptera: Diaspididae) on material for consumption (NIS action policy, March 25, 2008). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, National Identification Services (NIS). 2 pp.

Nishikawa, J., and C. Nakashima. 2019. Morphological and molecular characterization of the strawberry black leaf spot pathogen referred to as the strawberry pathotype of *Alternaria alternata*. Mycoscience 60(1):1-9.

NRCS. 2021. PLANTS Database. United States Department of Agriculture, Natural Resources Conservation Service. Greensboro, NC. Last accessed: 9/30/2021. plants.sc.egov.usda.gov/home.

Nugent, L., P. Sihanonth, S. Thienhirun, and A. Whalley. 2005. *Biscogniauxia*: a genus of latent invaders. Mycologist 19(1):40-43.

Obraztsov, N. S. 1964. Neotropical microlepidoptera, V. Synopsis of the species of the genus *Proeulia* from central Chile (Lepidoptera: Tortricidae). Proceedings of the United States National Museum 116:183-195.

Okabe, I., and N. Matsumoto. 2003. Phylogenetic relationship of *Sclerotium rolfsii* (teleomorph *Athelia rolfsii*) and *S. delphinii* based on ITS sequences. Mycological Research 107(2):164-168.

Palm, M. E., and A. Y. Rossman. 2003. Invasion pathways of terrestrial plant-inhabiting fungi. *in* G. M. Ruiz and J. T. Carlton, (eds.). Invasive Species: Vectors and Management Strategies. Island Press, New York.

Parra, L. E., and L. A. Cerda. 1991. Presencia de *Proeulia chrysopteris* (Butler) (Lepidoptera: Tortricidae) sobre *Pinus radiata* D. Don. Bosque 12(2):61-63.

Pastori, P. L., C. Joao Arioli, M. Botton, L. B. Monteiro, L. Stoltman, and A. Mafra-Neto. 2012. Integrated control of two tortricid (Lepidoptera) pests in apple orchards with sex pheromones and insecticides. Revista Colombiana de Entomología 38(2):224-230.

Pearson, R. C., and A. C. Goheen (eds.). 1988. Compendium of Grape Diseases. APS Press, St. Paul, MN. 93 pp.

Peña, E., E. Olate, R. Chorbadjian, and I. Rosales. 2011. First Report of *Alfalfa mosaic virus* Infection in *Viburnum tinus* in Chile. Plant Disease 95(9):1198-1198.

Pennycook, S. R. 1989. Plant Diseases recorded in New Zealand, Volume 3 Department of Scientific and Industrial Research, Plant Diseases Division, Auckland, New Zealand. 180 pp.

PERAL. 2007. Phytosanitary risks associated with armored scales in commercial shipments of fruit for consumption to the United States, Revision Original. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory (PERAL), Raleigh, NC. 24 pp.

PERAL. 2019. Pest Categorization - *Nepovirus Arabis mosaic virus* - Picornavirales: Secoviridae. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Epidemiology and Risk Analysis Laboratory, Raleigh, NC. 2 pp.

Peralta, A. 1993. New records of eriophyid species (Acarina, Eriophyoidea) on fig (*Ficus carica* L.) and avocado (*Persea americana* Mill.) in Chile. Agricultura Técnica (Santiago) 53(1):101-103.

PestID. 2021. Pest Interception Database. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine. Last accessed: 4/1/2021. aqas.aphis.usda.gov/aqas/.

Petit, E., and W. D. Gubler. 2005. Characterization of *Cylindrocarpon* species, the cause of black foot disease of grapevine in California. Plant Disease 89(10):1051-1059.

Pierce, L., and McCain, A.H. 1982. Stem rot and wilt of *Exacum affine* caused by *Nectria haematococca*. University of California. Berkeley, CA. American Phytopathological Society. Plant Diseases 66:161-163

Pildain, M. B., M. P. Coetzee, B. D. Wingfield, M. J. Wingfield, and M. Rajchenberg. 2010. Taxonomy of *Armillaria* in the Patagonian forests of Argentina. Mycologia 102(2):392-403.

Pildain, M. B., G. Pérez, G. Robledo, D. B. Pappano, and M. Rajchenberg. 2017. *Arambarria* the pathogen involved in canker rot of *Eucalyptus*, native trees wood rots and grapevine diseases in the Southern Hemisphere. Forest Pathology 47(6):e12397.

Pizarro-Araya, J., J. Cepeda-Pizarro, J. E. Barriga, and A. Bodini. 2009. Biological vulnerability in the Elqui Valley (Coquimbo Region, Chile) to economically important arthropods. Ciencia e Investigación Agraria 36(2):215-228.

Pizarro, J. C., and J. P. Araya. 2004. Ecología del Valle del Elqui: Insectos y Otros Artrópodos. Universidad de Regina (Canadá)-Universidad de La Serena (Chile). 24 pp.

Powell, J. A. 1986. Synopsis of the classification of Neotropical Tortricinae, with descriptions of new genera and species (Lepidoptera: Tortricidae). Pan-Pacific Entomologist 62(4):372-398.

PPQ. 2020. Plants for Planting Manual. United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ). Washington, DC. 1430 pp.

Prado C., E. 1988. Notas sobre insectos de importancia agrícola en Chile. Agricultura Tecnica (Chile) 48(1):51-54.

Prado C., E. 1991. Artropodos y Sus Enemigos Naturales Asociados a Plantas Cultivadas en Chile. Instituto de Investigaciones Agropecuarias, Santiago, Chile. 203pp.

Puig, A., J. Marelli, T. Matsumoto, L. Keith, and O. Gutierrez. 2019. First report of *Neofusicoccum parvum* causing pod rot on cacao in Hawaii. Plant Disease 103(6):1416.

Quiroga, D., P. Arretz, and J. E. Araya. 1991. Sucking insects damaging jojoba, *Simmondsia chinensis* (Link) Schneider, and their natural enemies, in the North Central and Central regions of Chile. Crop Protection 10(6):469-472.

Raabe, R. D., I. L. Conners, and A. P. N. S. C. Martinez. 1981. Checklist of Plant Diseases in Hawaii including Records of Microorganisms, principally Fungi, found in the State. University of Hawaii at Manoa, College of Tropical Agriculture and Human Resources. 313 pp.

Raski, D., W. Hewitt, and R. Schmitt. 1971. Controlling fanleaf virus-dagger nematode disease complex in vineyards by soil fumigation. California Agriculture 25(4):11-14.

Rehn, J. A., and M. Hebard. 1915. The genus *Gryllus* (Orthoptera) as found in America. Proceedings of the Academy of Natural Sciences of Philadelphia:293-322.

Rhodes, E. M., and O. E. Liburd. 2015. Featured Creatures: a predatory mite. University of Florida, Gainesville, FL. Last accessed 9/10/2021. entnemdept.ufl.edu/creatures/beneficial/neoseiulus_californicus.htm.

Rider, D. A. 2007. Plant Host Records: Pentatomidae: Pentatominae. North Dakota State University, Department of Entomology. Last accessed: 9/3/2021. ndsu.edu/faculty/rider/Pentatomoidea/Hosts/plant_Pent_Aphylinae.htm

Rodriguez, H. G. 2007. Nematodos Fitoparasitos que afectan a frutales y vides en Chile (Boletin Inia No 149). Ministerio de Agricultura, Instituto de Investigaciones Agropecuarias, Santiago, Chile. 175 pp.

Roehrich, R., and E. Boller. 1991. Tortricids in vineyards. Pages 507-514 *in* L. P. S. van der Geest and H. H. Evenhuis, (eds.). Tortricid Pests: Their Biology, Natural Enemies and Control. Elsevier Science Publishers B.V., Amsterdam.

Rousseau, J., L. Blateyron, J. B. Drouillard, and N. Bonnet. 2005. Tordeuses de la grappe et moisissures associées: incidences sur la vinification et la qualité du vin. Phytoma (587):13-16.

Rubilar, P., and E. Aballay. 2006. Morphometrics of two *Pratylenchus* species associated with sugar beet in the Eighth Region (Bio-Bio), Chile. Fitopatologia 41(2):81-85.

SAG. 2003. Lista de Plagas Asociadas a la Uva de Mesa en Chile [List of Pests Associated with table grapes in Chile]. Departamento Proteccion Agricola, Subdepto. Vigilancia Fitosanitaria, Santiago, Chile. 9 pp.

SAG. 2021a. Annex - Arthropods Requested by the U.S. in Chilean Export of Table Grapes. Servicio Agrícola y Ganadero, Santiago, Chile. 4 pp.

SAG. 2021b. Archivo Entomologico- *Acledra fraterna*. Servicio Agrícola y Ganadero - Región Metropolitana, Santiago, Chile. Last accessed 9/8/2021, https://microimagenes.sag.gob.cl/default.asp?IDESP=169.

SAG. 2021c. Archivo Entomologico- *Pseudococcus cribata*. Servicio Agrícola y Ganadero - Región Metropolitana, Santiago, Chile. Last accessed 9/8/2021, https://microimagenes.sag.gob.cl/default.asp?IDESP=243.

SAG. 2021d. Archivo Entomologico- *Pseudococcus meridionalis*. Servicio Agrícola y Ganadero, Región Metropolitana, Santiago, Chile. Last accessed 9/15/2021, https://microimagenes.sag.gob.cl/default.asp?IDESP=244.

SAG. 2021e. Mosca de la fruta. Servicio Agrícola y Ganadero, Santiago, Chile. Last accessed 9/13/2021, http://www.sag.cl/ambitos-de-accion/mosca-de-la-fruta.

Sakayaroj, J., S. Preedanon, O. Supaphon, E. G. Jones, and S. Phongpaichit. 2010. Phylogenetic diversity of endophyte assemblages associated with the tropical seagrass *Enhalus acoroides* in Thailand. Fungal diversity 42(1):27-45.

Santha, I. 1981. Biology and control of the grapevine gall mite *Calepitrimerus vitis* Nal. Novenyvedelem. Universidad de Concepcion, Chillan (Chile). Escuela de Agronomia. 17(10-11)

Scheck, H., S. Vasquez, W. Gubler, and D. Fogle. 1998. First report of three *Phaeoacremonium* spp. causing young grapevine decline in California. Plant Disease 82(5):590-590.

Schmitz, V., R. Roehrich, and J. Stockel. 1996. Déplacements d'adultes de *Lobesia botrana* marqués et lachés dans un vignoble isolé: étude de l'effet de la phéromone sexuelle synthétique sur leurs mouvements. Journal International des Sciences de la Vigne et du Vin 30(2):67-72.

Sengonca, C. a. C. A. 1999. Survey on the distribution of the horse chestnut scale *Pulvinaria regalis* Canard (Hom., Coccidae) in Germany in the years 1996 to 1998. Anzeiger für Schädlingskunde, Pflanzenschutz, Umweltschutz 72(6):153-157.

Serrato-Diaz, L., A. Aviles-Noriega, A. Soto-Bauzó, L. Rivera-Vargas, R. Goenaga, and P. Bayman. 2020. Botryosphaeriaceae fungi as causal agents of dieback and corky bark in rambutan and longan. Plant Disease 104(1):105-115.

Sharma, S., S. McKirdy, A. Mackie, and F. Lamberti. 2003. First record of *Xiphinema rivesi* associated with grape vines in Western Australia. Nematologia Mediterranea. Nematologia Mediterranea 31(87)

Shaw, C. G. 1973. Host fungus index for the Pacific Northwest - 1. Hosts (Bulletin 756). Washington Agricultural Experiment Station, Pullman, WA. 121 pp.

Sher, S. A. 1966. Revision of the Hoplolaiminae (Nematoda) VI. *Helicotylenchus* Steiner, 1945. Nematologica 12:1-56.

Siddiqui, I. A., S. A. Sher, and A. M. French. 1973. Distribution of Plant Parasitic Nematodes in California. Sacramento, USA: State of California Department of Food and Agriculture, Division of Plant Industry. 324 pp.

Simmons, G., M. C. Salazar Sepulveda, E. A. Fuentes Barrios, M. Idalsoaga Villegas, R. E. Medina Jimenez, A. R. Garrido Jerez, R. Henderson, and H. Donoso Riffo. 2021. Development of Sterile Insect Technique for Control of the European Grapevine Moth, *Lobesia botrana*, in Urban Areas of Chile. Insects 12(5):378.

Simmons, R. B., and M. G. Pogue. 2004. Redescription of two often-confused noctuid pests, *Copitarsia decolora* and *Copitarsia incommoda* (Lepidoptera: Noctuidae: Cuculliinae). Annals of the Entomological Society of America 97(6):1159-1164.

Skelley, P. 2008. Generic guide to new world scarab beetles. University of Nebraska State Museum - Division of Entomology, Lincoln, NE. Last accessed 9/13/2021, unsm-ento.unl.edu/Guide/Scarabaeoidea/Scarabaeidae/Aphodiinae/AphodiinaeTribes/Aphodiini/Labarrus/Labarrus.html.

Smith, A., and A. Evans. 2018. Taxonomic review of *Athliini* (Coleoptera: Scarabaeidae: Melolonthinae), a new tribe of scarab beetles endemic to South America. Zootaxa 4471(2):279–308.

Spies, C., P. Moyo, F. Halleen, and L. Mostert. 2018. *Phaeoacremonium* species diversity on woody hosts in the Western Cape Province of South Africa. Persoonia: Molecular Phylogeny and Evolution of Fungi 40:26-62.

Stace-Smith, R. 1970. Descriptions of Plant Virus. Tobacco ringspot virus (17). Association of Applied Biologists. Last accessed: 9/14/2021 dpvweb.net/dpv/showdpv/?dpvno=309

Stace-Smith, R. 1984. Descriptions of Plant Virus. Tomato ringspot virus (290). Association of Applied Biologists. Last accessed: 9/15/2021 dpvweb.net/dpv/showdpv/?dpvno=309.

Stevenson, J. A. 1975. The Fungi of Puerto Rico and the American Virgin Islands. Reed Herbarium, Baltimore, MD. 743 pp.

Summers, C. G., A. S. Newton, and K. R. Hansen. 1995. Susceptibility of selected grape cultivars and tree fruit to silverleaf whitefly (*Bemisia argentifolii*) colonization. HortScience 30(5):1040-1042.

Taerum, S. J., Z. W. De Beer, S. Marincowitz, R. Jankowiak, and M. J. Wingfield. 2018. *Ophiostoma quercus*: an unusually diverse and globally widespread tree-infecting fungus. Fungal Biology 122(9):900-910.

Tai, F. L. 1979. Sylloge Fungorum Sinicorum. Chinese Academy of Sciences, Science Press, Peking, China. 1527 pp.

Takeuchi, Y., Fowler, G., and Joseph, A. S. 2018. SAFARIS: Global Plant Hardiness Zone Development. North Carolina State University, Center for Integrated Pest Management;

United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Science and Technology, Plant Epidemiology and Risk Analysis Laboratory, Raleigh, NC. 6p.

Tapia, L., A. Larach, N. Riquelme, J. Guajardo, and X. Besoain. 2020. First Report of *Neofusicoccum luteum* Causing Stem-End Rot Disease on Avocado Fruits in Chile. Plant Disease 104(7):2027.

Travadon, R., D. P. Lawrence, S. Rooney-Latham, W. D. Gubler, W. F. Wilcox, P. E. Rolshausen, and K. Baumgartner. 2015. *Cadophora* species associated with wood-decay of grapevine in North America. Fungal Biology 119(1):53-66.

UGA. 2018. red spotted tortoise beetle *Chelymorpha varians* (Blanchard, 1851). University of Georgia - Center for Invasive Species and Ecosystem Health, USDA Animal and Plant Health Inspection Service, USDA Forest Service, USDA Identification Technology Program, and USDA National Institute of Food and Agriculture, Athens, GA. Last accessed 9/9/2021, invasive.org/browse/subinfo.cfm?sub=21542.

UGA. 2019a. Widely Prevalent Bacteria of the United States. University of Georgia, Center for Invasive Species and Ecosystem Health. Last accessed: 9/15/2021. prevalentbacteria.org/state.cfm?id=us_HI.

UGA. 2019b. Widely Prevalent Nematodes of the United States. University of Georgia, Center for Invasive Species and Ecosystem Health. Last accessed: 9/15/2021. prevalentnematodes.org/subject.cfm?id=57601.

UGA. 2019c. Widely Prevalent Viruses of the United States. University of Georgia, Center for Invasive Species and Ecosystem Health. Last accessed: 9/15/2021 prevalentviruses.org/index.html.

Úrbez-Torres, J., and W. Gubler. 2009. Pathogenicity of *Botryosphaeriaceae* species isolated from grapevine cankers in California. Plant Disease 93(6):584-592.

Úrbez-Torres, J. R. 2011. The status of *Botryosphaeriaceae* species infecting grapevines. Phytopathologia Mediterranea 50:S5-S45.

Úrbez-Torres, J. R., G. M. Leavitt, T. M. Voegel, and W. Gubler. 2006. Identification and distribution of *Botryosphaeria* spp. associated with grapevine cankers in California. Plant Disease 90(12):1490-1503.

Úrbez-Torres, J. R., F. Peduto, R. Striegler, K. Urrea-Romero, J. Rupe, R. Cartwright, and W. Gubler. 2012. Characterization of fungal pathogens associated with grapevine trunk diseases in Arkansas and Missouri. Fungal Diversity 52(1):169-189.

USDA ARS. 1960. Index of Plant Diseases in the United States (Agriculture Handbook No. 165). United States Department of Agriculture, Agricultural Research Service (USDA ARS), Washington, DC. 531 pp.

USDA, N. L. 2007. USDA Nematode Collection: *Meloidogyne ethiopica*. United States Department of Agriculture, Nematology Laboratory. Last accessed: 9/3/2021. nt.ars-grin.gov/nematodes/search.cfm

Valencia, A., R. Torres, and B. Latorre. 2011. First report of *Pestalotiopsis clavispora* and *Pestalotiopsis* spp. causing postharvest stem end rot of avocado in Chile. Plant Disease 95(4):492.

Valencia, A. L., P. M. Gil, B. A. Latorre, and I. M. Rosales. 2019. Characterization and pathogenicity of *Botryosphaeriaceae* species obtained from avocado trees with branch canker and dieback and from avocado fruit with stem end rot in Chile. Plant Disease 103(5):996-1005.

Vargas, H. A., and A. K. Hundsdoerfer. 2019. Two new native larval host plants of *Hyles annei* (Guérin-Méneville, 1839) (Lepidoptera, Sphingidae) in the Atacama Desert of northern Chile following exceptional summer rainfall. Nota Lepidopterologica 42:151.

Vassiliou, V. A. 2011. Effectiveness of insecticides in controlling the first and second generations of the *Lobesia botrana* (Lepidoptera: Tortricidae) in Table Grapes. Journal of Economic Entomology 104(2):580-585.

Venette, R. C., and J. R. Gould. 2006. A pest risk assessment for *Copitarsia* spp., insects associated with importation of commodities into the United States. Euphytica 148(1):165-183.

Vinnere, O., J. Fatehi, S. A. Wright, and B. Gerhardson. 2002. The causal agent of anthracnose of *Rhododendron* in Sweden and Latvia. Mycological Research 106(1):60-69.

Walker, T. J., and S. Masaki. 1989. Natural History. *in* F. Huber, T. E. Moore, and W. Loher, (eds.). Cricket Behavior and Neurobiology. Cornell University Press, Ithaca, NY.

Walton, V. M., A. J. Dreves, D. H. Gent, D. G. James, R. R. Martin, U. Chambers, and P. A. Skinkis. 2007. Relationship between rust mites *Calepitrimerus vitis* (Nalepa), bud mites *Colomerus vitis* (Pagenstecher) (Acari: Eriophyidae) and short shootsyndrome in Oregon vineyards. International Journal of Acarology 33(4):307-318.

Wellman, F. L. 1977. Dictionary of Tropical American Crops and Their Diseases. The Scarecrow Press, Metuchen, NJ. 495 pp.

Whittle, K. 1985. European grape vine moth: *Lobesia botrana* (Denis & Schiffermüller) (Pests Not Known to Occur in the United States or of Limited Distribution No. 60). USDA-APHIS, PPQ. Washington, DC

Wilcox, W., and B. Latorre. 2002. Identities and geographic distributions of *Phytophthora* spp. causing root rot of red raspberry in Chile. Plant Disease 86(12):1357-1362.

Wilcox, W. F., W. F. Gubler, and J. K. Uyemoto. 2015. Compendium of Grape Diseases, Disorders, and Pests. Second Edition. APS Press. 232 pp.

Wistermann, A., F. Grousset, F. Petter, G. Schrader, and M. Suffert. 2016. DROPSA Deliverable 1.3 Report for Table grapes – Fruit pathway and Alert List. DROPSA is funded by the European Union's Seventh Framework Programme for research, technological development and demonstration (grant agreement no. 613678). European Union. Last accessed 9/10/2021, www.dropsaproject.eu.

Wunderlich, N., S. Savocchia, C. Steel, G. Ash, and H. Raman. 2009. Identification of *Botryosphaeria* spp. and first report of *Dothiorella viticola* ('*Botryosphaeria' viticola*) associated with bunch rot in Australia. Phytopathologia Mediterranea 48:162.

Zalucki, M. P., A. R. Clarke, and S. B. Malcolm. 2002. Ecology and behavior of first instar larval Lepidoptera. Annual Review of Entomology 47:361-393.

Zamorano, A., G. Medina, C. Fernández, W. Cui, N. Quiroga, and N. Fiore. 2019. First report of *Grapevine Pinot gris virus* in grapevine in Chile. Plant Disease 103(6):1438.

Zaviezo, T., A. Romero, and M. Soledad Oyarzún. 2015. Biología de nuevas especies de chanchitos blancos. Revista Agronomía y Forestal 52:28-32.

Zlatković, M., M. J. Wingfield, F. Jami, and B. Slippers. 2019. Genetic uniformity characterizes the invasive spread of *Neofusicoccum parvum* and *Diplodia sapinea* in the Western Balkans. Forest Pathology 49(1):e12491.

6. Appendix: Pests with non-quarantine status

We found evidence that the organisms listed below are associated with *Vitis vinifera* and present in Chile. Because these organisms are not of quarantine significance for the United States and territories (ARM, 2021 as defined by ISPM 5, IPPC, 2019), we did not list them in Table 1 nor did we intensively evaluate their association with *Vitis vinifera* and their presence in Chile. Therefore, the organisms are considered to have only "potential" association with the commodity and presence in Chile.

We listed these organisms along with the references supporting their potential presence in Chile, their presence in the United States and territories (if applicable), and their potential association with *Vitis vinifera*. If any of the organisms are **not** present in the United States and territories, we also provided justification for their non-quarantine status. Unless otherwise noted, these organisms are non-actionable at U.S. ports of entry (ARM, 2021).

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Arthropoda: Arachnida				
Mesostigmata: Blattisociidae				
Blattisocius keegani Fox	Beavers, 1972	Beavers, 1972	Predator of pests on *Vitis vinifera* (Beavers, 1972)	While predators may associate with the commodity, they are non-quarantine because they feed on the pests.
Mesostigmata: Phytoseiidae				
Neoseiulus californicus (McGregor); syn. *N. chilenensis* Dosse, *Amblyseius chilenensis* (Dosse)	CABI, 2021	Rhodes and Liburd, 2015	Predator of pests on *Vitis vinifera* (CABI, 2021)	While predators may associate with the commodity, they are non-quarantine because they feed on the pests.
Trombidiformes: Eriophyidae				
Calepitrimerus vitis Nalepa	Santha, 1981	Alford, 2014; CABI, 2021	Alford, 2014; CABI, 2021	
Trombidiformes: Rhyncaphytopidae				
Rhyncaphytoptus ficifoliae Keifer	Klein Koch and Waterhouse, 2000; Peralta, 1993	Abou-Awad et al., 2000	Essig Museum Online Database, 2021	
Trombidiformes: Tarsonemidae				
Tarsonemus waitei Banks	Ewing, 1939; Çobanoğlu,	Lindquist, 1978	Wistermann et al., 2016	

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Polyphagotarsonemus latus (Banks)	Klein Koch and Waterhouse, 2000	CABI, 2021	CABI, 2021	
Trombidiformes: Tenuipalpidae				
Brevipalpus obovatus Donnadieu	Hill, 1987	Hill, 1987	Hill, 1987	
Brevipalpus phoenicis (Geijskes)	Hill, 1987	Hill, 1987	Hill, 1987	
Trombidiformes: Tetranychidae				
Bryobia rubrioculus (Sheuten)	Beard, 2018; Migeon and Dorkeld, 2021	Beard, 2018; Hill, 1987; Migeon and Dorkeld, 2021	Beard, 2018; Migeon and Dorkeld, 2021	
Bryobia praetiosa Koch	Beard, 2018; Hill, 1987	Beard, 2018; Hill, 1987	Beard, 2018	
Eotetranychus lewisi (McGregor)	CABI, 2021; Klein Koch and Waterhouse, 2000; Migeon and Dorkeld, 2021	CABI, 2021; Migeon and Dorkeld, 2021	Klein Koch and Waterhouse, 2000; Migeon and Dorkeld, 2021	
Oligonychus punicae (Hirst)	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	
Oligonychus yothersi (McGregor)	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	
Panonychus citri (McGregor)	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	
Panonychus ulmi (Koch)	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	
Petrobia latens (Müller)	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	Migeon and Dorkeld, 2021	
Tetranychus desertorum Banks	Klein Koch and Waterhouse, 2000	EPPO, 2021	Klein Koch and Waterhouse, 2000	

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Tetranychus ludeni Zacher	Hill, 1987; Migeon and Dorkeld, 2021	Hill, 1987; Migeon and Dorkeld, 2021	Hill, 1987; Migeon and Dorkeld, 2021	
Tetranychus urticae Koch	Migeon and Dorkeld, 2021	Hill, 1987; Migeon and Dorkeld, 2021	Alford, 2014; Migeon and Dorkeld, 2021	
Arthropoda: Insecta				
Coleoptera: Coccinellidae				
Harmonia axyridis (Pallas)	CABI, 2021	CABI, 2021	CABI, 2021	
Coleoptera: Curculionidae				
Naupactus godmanni (Crotch); syn. *Pantomorus cervinus* (Boheman)	CABI, 2021; González, 1983	CABI, 2021	CABI, 2021; González, 1983	
Otiorhynchus rugosostriatus (Goeze)	González et al., 1973	CABI, 2021	González et al., 1973	
Otiorhynchus sulcatus (Fabricius)	CABI, 2021; Morrone, 1999	CABI, 2021	CABI, 2021	
Coleoptera: Nitidulidae				
Carpophilus dimidiatus (F.)	González et al., 1973; Klein Koch and Waterhouse, 2000	Connell, 1977	Stored product pest (Connell, 1977)	
Carpophilus hemipterus (L.)	González et al., 1973; Klein Koch and Waterhouse, 2000	Connell, 1977	Stored product pest (Connell, 1977)	
Urophorus humeralis F.; syn. *Carpophilus humeralis* (F.)	CABI, 2021	CABI, 2021	Hill, 1987	
Labarrus lividus (Olivier); syn. *Aphodius lividus* (Olivier)	Skelley, 2008	Skelley, 2008	generalist (Skelley, 2008)	
Dermaptera: Forficulidae				
Forficula auricularia Linnaeus	CABI, 2021	CABI, 2021	CABI, 2021	
Diptera: Drosophilidae				

Organism	**In Chile**	**In U.S.**	***Vitis vinifera* Association**	**Notes**
Drosophila funebris (F.)	Brncic, 1970; Jara, 2014	Brncic, 1970	Avidov and Harpaz, 1969	
Drosophila melanogaster Meigen	Brncic, 1970; Jara, 2014	Brncic, 1970	Avidov and Harpaz, 1969	
Drosophila simulans Sturtevan	Brncic, 1970	Brncic, 1970	Decaying material in general (Brncic, 1970)	
Drosophila suzukii Matsumura	Brncic, 1970	Brncic, 1970	Decaying material in general (Brncic, 1970)	
Hemiptera: Aphididae				
Aphis craccivora Koch	CABI, 2021	CABI, 2021	CABI, 2021	
Aphis fabae Scopoli	CABI, 2021	CABI, 2021	Blackman and Eastop, 2000	
Aphis gossypii Glover	CABI, 2021	CABI, 2021	Blackman and Eastop, 2000	
Aphis illinoisensis Shimer	CABI, 2021	CABI, 2021	Blackman and Eastop, 2000	
Aphis spiraecola Patch	CABI, 2021	CABI, 2021	Blackman and Eastop, 2000	
Macrosiphum euphorbiae Thomas	CABI, 2021	CABI, 2021	CABI, 2021	
Tuberolachnus salignus (Gmelin)	González et al., 1973; Klein Koch and Waterhouse, 2000	Baker, 2016	González et al., 1973; Klein Koch and Waterhouse, 2000	
Hemiptera: Coccidae				
Ceroplastes cirripediformis Comstock	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Coccus hesperidum (L.)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	

Organism	**In Chile**	**In U.S.**	***Vitis vinifera* Association**	**Notes**
Dysmicoccus brevipes (Cockerell)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Parasaissetia nigra (Nietner)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Parthenolecanium corni (Bouché)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Parthenolecanium persicae (F.)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Phenacoccus solenopsis Tinsley	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Planococcus citri (Risso)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Planococcus ficus (Signoret)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016; da Silva et al., 2017	
Pseudococcus calceolariae (Maskell)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Saissetia coffeae (Walker)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Saissetia oleae Olivier	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Hemiptera: Diaspididae[4]				
Aonidiella aurantii (Maskell)	CABI, 2021	CABI, 2021	CABI, 2021	
Aspidiotus destructor Signoret	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Aspidiotus nerii Bouche	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	

[4] All armored scales (Diaspididae) are non-actionable at U.S. ports of entry on fruits and vegetables for consumption (NIS, 2008). Therefore, we did not need to determine whether they occur in the United States.

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Chrysomphalus aonidum (L.)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Chrysomphalus dictyospermi (Morgan)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Comstockaspis perniciosa (Comstock); syn. *Quadraspidiotus perniciosus* Comstock	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Diaspidiotus ancylus (Putnam)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Hemiberlesia lataniae (Signoret)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Hemiberlesia rapax (Comstock)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Lepidosaphes ulmi (L.)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Parlatoria cinerea Hadden in Doane & Hadden	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Pseudaulacaspis pentagona (Targioni Tozzetti)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Pinnaspis strachani (Cooley)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Hemiptera: Pentatomidae				
Nezara viridula (Linnaeus)	González et al., 1973; Klein Koch and Waterhouse, 2000	CABI, 2021	González et al., 1973; Klein Koch and Waterhouse, 2000	
Hemiptera: Pseudococcidae				
Dysmicoccus brevipes (Cockerell)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Pseudococcus longispinus (Targioni Tozzetti)	García Morales et al., 2016	García Morales et al., 2016	da Silva et al., 2017	

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Pseudococcus maritimus (Ehrhorn)	García Morales et al., 2016	García Morales et al., 2016	García Morales et al., 2016	
Pseudococcus viburni (Signoret); syn. *Pseudococcus affinis* (Maskell)	Correa et al., 2012; García Morales et al., 2016	García Morales et al., 2016	Correa et al., 2012; García Morales et al., 2016	
Hymenoptera: Formicidae				
Linepithema humile (Mayr)	CABI, 2021	CABI, 2021	[highly polyphagous] CABI, 2021	Ants are eusocial insects; individuals able to start a new colony will not follow the pathway.
Hymenoptera: Tenthredinidae				
Ametastegia glabrata (Fallén)	Baine et al., 2020	Baine et al., 2020	Baine et al., 2020	
Hymenoptera: Vespidae				
Vespula germanica (F.); syn. *Paravespula germanica* (F.)	CABI, 2021	CABI, 2021	[highly polyphagous] CABI, 2021	Wasps are eusocial insects; individuals able to start a new colony will not follow the pathway.
Lepidoptera: Noctuidae				
Agrotis ipsilon (Hufnagel)	Klein Koch and Waterhouse, 2000	Hill, 1987	Hill, 1987	
Heliothis virescens (Fabricius)	CABI, 2021	CABI, 2021	CABI, 2021	
Peridroma saucia (Hübner)	CABI, 2021	CABI, 2021	CABI, 2021	
Spodoptera eridania (Cramer)	CABI, 2021	CABI, 2021	CABI, 2021	
Spodoptera frugiperda (J.E. Smith)	CABI, 2021	CABI, 2021	CABI, 2021	
Trichoplusia ni (Hübner)	Hill, 1987; Klein Koch and Waterhouse, 2000	Worldwide Hill, 1987	[highly polyphagous] Hill, 1987	
Lepidoptera: Pyralidae				
Ephestia elutella (Hübner)	Hill, 1987	Hill, 1987	Hill, 1987	
Lepidoptera: Sphingidae				

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Hyles lineata (Fabricius); syn. *Celerio lineata* (Fabricius)	González et al., 1973	González et al., 1973	Francois, 2020	
Orthoptera: Gryllidae				
Gryllus assimilis (F.)	Rehn and Hebard, 1915	Rehn and Hebard, 1915	[based on *Gryllus* in general] Walker and Masaki, 1989	
Thysanoptera: Thripidae				
Drepanothrips reuteri (Uzel)	González et al., 1973; Klein Koch and Waterhouse, 2000	González et al., 1973; Klein Koch and Waterhouse, 2000	CABI, 2021	
Frankliniella occidentalis (Pergrande)	CABI, 2021	CABI, 2021	CABI, 2021; [highly polyphagous] de Borbon et al., 2006	
Frankliniella schultzei (Trybom)	CABI, 2021	CABI, 2021	CABI, 2021; [highly polyphagous] de Borbon et al., 2006	
Heliothrips haemorrhoidalis (Bouche)	Bournier, 1977; CABI, 2021; Manosalva et al., 2011	CABI, 2021	Bournier, 1977; Manosalva et al., 2011	
Limothrips cerealium (Haliday)	CABI, 2021; Hill, 1987; Klein Koch and Waterhouse, 2000	CABI, 2021; Hill, 1987	CABI, 2021	
Thrips tabaci Linderman	Klein Koch and Waterhouse, 2000	CABI, 2021	[highly polyphagous] de Borbon et al., 2006	
BACTERIA				
Agrobacterium tumefaciens (Smith & Townsend) Conn	EPPO, 2021	CABI, 2021	EPPO, 2021	

Organism	In Chile	In U.S.	***Vitis vinifera* Association**	Notes
Candidatus Phytoplasma fraxini' Griffiths, Sinclair, Smart & Davis	Gajardo et al., 2009	EPPO, 2021	Gajardo et al., 2009	
Pseudomonas syringae pv. *syringae* van Hall	Mujica and Oehrens, 1967	CABI, 2021; UGA, 2019a)	Alfieri et al., 1984	
Rhizobium radiobacter (Beijerinck & van Delden 1902) Young et al. (Syn. *Agrobacterium radiobacter* (Beijerinck & van Delden 1902) Conn)	Mujica and Vergara, 1945	CABI, 2021	Auger et al., 2007	
Xylella fastidiosa Wells et al.	Golino, 1993	Costa et al., 2004	Berisha et al., 1998; Costa et al., 2004	
FUNGI				
Alternaria alternata (Fr.: Fr.) Keissl.Syn.: *Alternaria mali* Roberts; *Alternaria tenuis* Nees; *Alternaria tenuissima* (Nees & T. Nees : Fr.) Wiltshire	Mujica and Vergara, 1945	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Jayawardena et al., 2018	
Aspergillus niger Tiegh.	Mujica and Oehrens, 1967	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	USDA ARS, 1960	
Athelia rolfsii (Curzi) C.C. Tu & Kimbr.	Okabe and Matsumoto, 2003	Raabe et al., 1981; USDA ARS, 1960; Wellman, 1977	Pennycook, 1989	
Aureobasidium pullulans (de Bary) G. Arnaud (Syn. *Aureobasidium vitis* Viala & Boyer)	Mujica and Vergara, 1945	Raabe et al., 1981; USDA ARS, 1960	Jayawardena et al., 2018	
Botryosphaeria dothidea (Moug. : Fr.) Ces. & De Not.	Úrbez-Torres, 2011	Alfieri et al., 1984; Denman et al., 2003; Stevenson, 1975	Úrbez-Torres, 2011	
Botrytis cinerea Pers. : Fr. (Syn. *Sclerotinia fuckeliana* (de Bary) Fuckel)	Mujica and Vergara, 1945	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Mujica and Vergara, 1945	

Organism	In Chile	In U.S.	***Vitis vinifera* Association**	Notes
Capnodium salicinum Mont.	Mujica and Vergara, 1945	USDA ARS, 1960	Checa, 2004	
Cladosporium cladosporioides (Fresen.) G.A. De Vries	Briceño and Latorre, 2007	Raabe et al., 1981; Sakayaroj et al., 2010; USDA ARS, 1960	Briceño and Latorre, 2007	
Cladosporium herbarum (Pers. : Fr.) Link	Mujica and Oehrens, 1967	Lenné, 1990; Raabe et al., 1981; USDA ARS, 1960	Mujica and Oehrens, 1967	
Cladosporium macrocarpum Preuss	Mujica and Oehrens, 1967	USDA ARS, 1960	Jayawardena et al., 2018	
Colletotrichum acutatum J.H. Simmonds	Butin and Peredo, 1986	Vinnere et al., 2002	Vinnere et al., 2002	
Colletotrichum dematium (Pers. : Fr.) Grove	Wellman, 1977	Stevenson, 1975; USDA ARS, 1960	Jayawardena et al., 2018	
Colletotrichum gloeosporioides (Penz.) Penz. & Sacc. (Syn. *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk)	Mujica and Vergara, 1945	Alfieri et al., 1984; Raabe et al., 1981; Stevenson, 1975	Alfieri et al., 1984	
Colletotrichum godetiae Neerg.	Damm et al., 2012	Damm et al., 2012	Jayawardena et al., 2018	
Cytospora chrysosperma (Pers. : Fr.) Fr.	Mujica and Vergara, 1945	USDA ARS, 1960	Jayawardena et al., 2018	
Diaporthe ampelina (Berk & M.A. Curtis) R.R. Gomes, C. Glienke & Crous	Mujica and Oehrens, 1967	USDA ARS, 1960	Farr and Rossman, 2021	
Diaporthe eres Nitschke	Lombard et al., 2014	USDA ARS, 1960	Jayawardena et al., 2018	
Diaporthe rudis (Fr. : Fr.) Nitschke (Syn. *Diaporthe medusaea* Nitschke)	Díaz et al., 2017	USDA ARS, 1960	Casieri et al., 2009	
Diplodia sapinea (Fr.) Fuckel	Butin and Peredo, 1986	Raabe et al., 1981; USDA ARS, 1960	Zlatković et al., 2019	
Diplodia seriata De Not. (Syn. *Botryosphaeria obtusa* Schwein.)	Auger et al., 2007	Raabe et al., 1981; USDA ARS, 1960	Auger et al., 2007	

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Elsinoe ampelina Shear (Syn. *Gloeosporium ampelophagum* (Pass.) Sacc.)	Mujica and Vergara, 1945	USDA ARS, 1960	Mujica and Vergara, 1945	
Erysiphe necator var. necator Schwein (Syn. Oidium tuckeri Berk)	Mujica and Oehrens, 1967	Raabe et al., 1981; USDA ARS, 1960	Mujica and Oehrens, 1967	
Eutypa lata var. *lata* (Pers. : Fr.) Tul. & C. Tul. (Syn. *Eutypa lata* (Pers. : Fr.) Tul. & C. Tul.)	Cruz A, 2004	USDA ARS, 1960	Cruz A, 2004	
Eutypella leprosa (Pers. ex Fr.) Berl.	Díaz et al., 2013	Jayawardena et al., 2018	Díaz et al., 2013	
Fusarium sambucinum Fuckel (Syn. *Gibberella pulicaris* (Fr. : Fr.) Sacc)	Mujica and Vergara, 1945	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Jayawardena et al., 2018	
Globisporangium debaryanum (R. Hesse) Uzuhashi, Tojo & Kakish. (Syn. *Pythium debaryanum* R. Hesse)	Mujica and Oehrens, 1967	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Mujica and Oehrens, 1967	
Globisporangium ultimum (Trow) Uzuhashi, Tojo & Kakish. (Syn. *Pythium ultimum* Trow)	Wellman, 1977	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Farr and Rossman, 2021	
Lasiodiplodia theobromae (Pat.) Griffon & Maubl.	Guajardo et al., 2018	French, 1989; Raabe et al., 1981; Wellman, 1977	French, 1989	
Macrophomina phaseolina (Tassi) Goid.	Butin and Peredo, 1986	Alfieri et al., 1984; Raabe et al., 1981; Stevenson, 1975	Raabe et al., 1981	
Monilinia fructicola (G. Winter) Honey	Latorre et al., 2014	USDA ARS, 1960	Farr and Rossman, 2021	
Monilinia laxa (Aderh. & Ruhland) Honey	Hrustić et al., 2015	Raabe et al., 1981; USDA ARS, 1960	Farr and Rossman, 2021	
Neocamarosporium betae (Berl.) Ariyawansa (Syn. *Phoma betae* A.B. Frank)	Mujica and Oehrens, 1967	USDA ARS, 1960	Mujica and Oehrens, 1967	

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Neocosmospora haematococca (Berk. & Broome) Samuels, Nalim & Geiser (Syn. *Haematonectria haematococca* (Berk. & Broome) Samuels & Rossman)	Moya, 2013	Pierce and McCain, 1982; Raabe et al., 1981	Casieri et al., 2009	
Neofusicoccum australe (Slippers, Crous & M.J. Wingf.) Crous, Slippers & A.J.L. Phillips (Syn. *Botryosphaeria australis* Slippers, Crous & M.J. Wingf.)	Besoain et al., 2013	Úrbez-Torres et al., 2006	Besoain et al., 2013	
Neofusicoccum luteum (Pennycook & Samuels) Crous, Slippers & A.J.L. Phillips	Tapia et al., 2020	Úrbez-Torres, 2011	Farr and Rossman, 2021	
Neofusicoccum parvum (Pennycook & Samuels) Crous, Slippers & A.J.L. Phillips	Zlatković et al., 2019	Puig et al., 2019; Serrato-Diaz et al., 2020; Úrbez-Torres et al., 2006	Zlatković et al., 2019	
Neopestalotiopsis clavispora (G.F. Atk.) Maharachch., K.D. Hyde & Crous	Valencia et al., 2011	Farr and Rossman, 2021; USDA ARS, 1960	Farr and Rossman, 2021	
Penicillium digitatum (Pers. : Fr.) Sacc.	Mujica and Vergara, 1945	Alfieri et al., 1984; Raabe et al., 1981; Stevenson, 1975	Jayawardena et al., 2018	
Penicillium expansum Link	Mujica and Vergara, 1945	Jayawardena et al., 2018; Raabe et al., 1981	Jayawardena et al., 2018	
Penicillium italicum Wehmer	Mujica and Oehrens, 1967	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Jayawardena et al., 2018	

Organism	**In Chile**	**In U.S.**	***Vitis vinifera* Association**	**Notes**
Phyllosticta ampelicida (Engelm.) Aa (Syn. *Guignardia bidwelli* (Ellis) Viala & Ravaz)	Mujica and Oehrens, 1967	Stevenson, 1975; USDA ARS, 1960	Mujica and Oehrens, 1967	
Phytophthora cactorum (Lebert & Cohn) J. Schröt.	Mujica and Oehrens, 1967	Erwin and Ribeiro, 1996; Raabe et al., 1981	Farr and Rossman, 2021	
Phytophthora cryptogea Pethybr. & Laff.	Erwin and Ribeiro, 1996	Erwin and Ribeiro, 1996	Farr and Rossman, 2021	
Phytophthora megasperma Drechsler	Latorre et al., 2001	Erwin and Ribeiro, 1996	Farr and Rossman, 2021	
Phytophthora nicotianae Breda de Haan	Mammella et al., 2013	Erwin and Ribeiro, 1996; Stevenson, 1975	Farr and Rossman, 2021	
Plasmopara viticola (Berk. & M.A. Curtis) Berl. & De Toni	Cruz A, 2004	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Cruz A, 2004	
Pythium aphanidermatum (Edson) Fitzp.	Mujica and Oehrens, 1967	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Farr and Rossman, 2021	
Rhizopus stolonifer (Ehrenb. : Fr.) Vuill. (Syn. *Rhizopus nigricans* Ehrenb.)	Mujica and Oehrens, 1967	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Farr and Rossman, 2021	
Schizophyllum commune Fr. : Fr.	Mujica and Oehrens, 1967	Raabe et al., 1981; Stevenson, 1975; USDA ARS, 1960	Farr and Rossman, 2021	
Sclerotinia sclerotiorum (Lib.) de Bary	Latorre and Guerrero, 2001	Raabe et al., 1981; USDA ARS, 1960	Latorre and Guerrero, 2001	
Sphaeropsis malorum Berk.	Mujica and Oehrens, 1967	Raabe et al., 1981; USDA ARS, 1960	Farr and Rossman, 2021	

Organism	In Chile	In U.S.	*Vitis vinifera* Association	Notes
Stemphylium vesicarium (Wallr.) E.G. Simmons	Mujica and Oehrens, 1967	Raabe et al., 1981; USDA ARS, 1960	Mujica and Oehrens, 1967	
Trichothecium roseum (Pers. : Fr.) Link	Mujica and Oehrens, 1967	Farr and Rossman, 2021; USDA ARS, 1960	Farr and Rossman, 2021	
Truncatella angustata (Pers.) S. Hughes	Espinoza et al., 2008	USDA ARS, 1960	Farr and Rossman, 2021	
Verticillium dahliae Kleb.	Cruz, 2004	USDA ARS, 1960	Cruz, 2004	
Xylaria hypoxylon (L. : Fr.) Grev.	Mujica and Oehrens, 1967	USDA ARS, 1960	Farr and Rossman, 2021	
NEMATODES				
Ditylenchus dipsaci (Kühn, 1857) Filip'ev	SAG, 2003	UGA, 2019b	SAG, 2003	
Helicotylenchus dihystera (Cobb, 1893) Sher	SAG, 2003	Sher, 1966; UGA, 2019b	Siddiqui et al., 1973	
Helicotylenchus pseudorobustus (Steiner) Golden	CABI, 2021b	UGA, 2019b	Siddiqui et al., 1973	
Meloidogyne arenaria (Neal) Chitwood	CABI, 2021b	CABI, 2021	Siddiqui et al., 1973	
Meloidogyne chitwoodi Golden, O'Bannon, Santo & Finley	Rodriguez, 2007	UGA, 2019b	Siddiqui et al., 1973	
Meloidogyne ethiopica Whitehead	Carneiro et al., 2004	USDA, 2007	Carneiro et al., 2004	
Meloidogyne hapla Chitwood	Rubilar and Aballay, 2006	Handoo et al., 2005; UGA, 2019b	Goodey et al., 1965	
Meloidogyne incognita (Kofoid & White) Chitwood	SAG, 2003	CABI, 2021; UGA, 2019b	López-Pérez et al., 2001	
Meloidogyne javanica (Treub) Chitwood	Aballay and Erikss, 2006	CABI, 2021; UGA, 2019b	Goodey et al., 1965	
Mesocriconema xenoplax (Raski) Loof & De Grisse (Syn. *Criconemella xenoplax* (Raski) Luc & Raski)	Rodriguez, 2007	Handoo, 2021	Siddiqui et al., 1973	
Paratrichodorus minor (Colbran) Siddiqi	SAG, 2003	CABI, 2021	Goodey et al., 1965	
Paratrichodorus porosus (Allen) Siddiqi	SAG, 2003	CABI, 2021	Sharma et al., 2003	

Organism	In Chile	In U.S.	***Vitis vinifera* Association**	Notes
Pratylenchus crenatus Loof	Auger et al., 2009	UGA, 2019b	Basso et al., 2017; Bovey, 1985	
Pratylenchus thornei Sher & Allen	Castro, 1998	UGA, 2019b	Alfieri et al., 1984	
Pratylenchus vulnus Allen & Jensen	Mujica and Oehrens, 1967	UGA, 2019b	Auger et al., 2007	
*Trichodorus primitivus (*de Man) Micoletzky	Mujica and Vergara, 1945	UGA, 2019b	Mujica and Vergara, 1945	
Tylenchulus semipenetrans Cobb	Auger et al., 2007	CABI, 2021	Mujica and Oehrens, 1967	
Xiphinema americanum Cobb	Mujica and Vergara, 1945	CABI, 2021b; UGA, 2019b	Cruz, 2004	
Xiphinema index Thorne & Allen	Mujica and Oehrens, 1967	Raski et al., 1971	Díaz et al., 2013	
Xiphinema rivesi Dalmasso	Cruz A, 2004	UGA, 2019b	Mujica and Oehrens, 1967	
VIRUSES AND VIROIDS				
Cucumovirus Cucumber mosaic virus	Díaz et al., 2013	UGA, 2019c	French, 1989	
Citrus exocortis viroid	CABI, 2021b	CABI, 2021	CABI, 2021b	
Tospovirus Tomato spotted wilt virus	EPPO, 2021	EPPO, 2021	EPPO, 2021	