

## Appendix 5 – Risk assessment tables for each species

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## **Baris sp.- Weevil [Coleoptera: Curculionidae]**

<b>Step</b>	<b>Rating</b>	<b>Justification</b>
<b>ENTRY – importation</b>		
Source orchard Packinghouse		Adults feed on fruit; unlikely that larvae feed on fruit. Washing, sorting and grading likely to remove external feeding individuals. Presence of gummosis would increase likelihood of detection of infested fruit. Adults are conspicuous and could be detected during inspection
Storage and transport On-arrival inspection		Adults may survive storage and transport. Adults are conspicuous and could be detected during inspection.
	Entry importation likelihood	Very low
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit Infected-infested fruit waste Distribution of infected/infested waste to environment Transfer to a susceptible host in endangered area		Adults may survive storage and transport.
	Entry – distribution likelihood	Low
	Overall entry likelihood	Very low
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts Suitability of the environment		Genus reported to attack a wide variety of hosts. Genus occurs in several countries and in similar environments to Australia.
Potential for adaptation of pest Reproductive strategy of pest		Many weevils are parthenogenetic with males unknown or rarely produced.
Method of pest survival Cultural practices & control measures		Chemical control programs for other pests of pineapple may also be effective against this genus.
	Establishment likelihood	Very low

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Most weevils are able flyers, but many have reduced wings and are flightless.
Presence of natural barriers		
Potential for movement		
Intended use		Consumption of fruit reduces likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very Low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Minor significance on a regional level - C
Direct effects on environment		Unlikely to be discernible on a regional level - A
Control and eradication		Significant on a regional level - D
Domestic trade		Minor significance on a national level - D
International trade		Unlikely to be discernible in a national level - A
Indirect effects on environment		Minor significance on a national level - D
<b>Potential economic consequences</b>		<b>Moderate</b>
<b>Unrestricted risk estimate</b>		<b>Negligible</b>

## ***Cholus spinipes* – Weevil [Coleoptera: Curculionidae]**

<b>Step</b>	<b>Rating</b>	<b>Justification</b>
<b>ENTRY – importation</b>		
Source orchard		Adults can feed on developing fruit and fruit suckers. Larvae can feed in the fruit stalk and in the centre of developing fruit.
Packinghouse		Washing, sorting and grading likely to remove external feeding individuals. Presence of gummosis would increase likelihood of detection of infested fruit. Adults are conspicuous and could be detected during inspection.
Storage and transport		Adults may survive storage and transport.
On-arrival inspection		Adults are conspicuous and could be detected during inspection.
Entry importation likelihood	Very low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults may survive storage and transport.
Infested-infested fruit waste		
Distribution of infested/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Only reported on pineapple.
Suitability of the environment		
Potential for adaptation of pest		
Reproductive strategy of pest		Many weevils are parthenogenetic with males unknown or rarely produced.
Method of pest survival		
Cultural practices & control measures		Good cultivation practices will eliminate weevil damage.
Establishment likelihood	Very low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Most weevils are able flyers, but many have reduced wings and are flightless.
Presence of natural barriers		
Potential for movement		Consumption of fruit reduces the likelihood of exposure to the environment.
Intended use		
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Minor significance on a regional level - C
Direct effects on environment		Unlikely to be discernible on a regional level - A
Control and eradication		Significant on a regional level -D
Domestic trade		Minor significance on a national level -D
International trade		Unlikely to be discernible in a national level -A
Indirect effects on environment		Minor significance on a national level - D
<b>Potential economic consequences</b>		<b>Moderate</b>
<b>Unrestricted risk estimate</b>		<b>Negligible</b>

## ***Cholus vaurieae* – Weevil [Coleoptera: Curculionidae]**

<b>Step</b>	<b>Rating</b>	<b>Justification</b>
<b>ENTRY – importation</b>		
Source orchard		Fruits are attacked by larvae when fully developed and in the process of ripening may rot. With high population densities adults may attack small fruits.
Packinghouse		Washing, sorting and grading likely remove external feeding individuals. Presence of rotting would increase likelihood of detection of infested fruit. Adults and larvae are conspicuous and could be detected during inspection.
Storage and transport		Adults may survive storage and transport.
On-arrival inspection		Adults and larvae are conspicuous and could be detected during inspection.
	Entry importation likelihood	Very low
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and larvae may survive storage and transport.
Infested-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
	Entry – distribution likelihood	Low
	Overall entry likelihood	Very low
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Only reported on pineapple.
Suitability of the environment		
Potential for adaptation of pest		
Reproductive strategy of pest		Many weevils are parthenogenetic with males unknown or rarely produced.
Method of pest survival		
Cultural practices & control measures		
	Establishment likelihood	Low

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Most weevils are able flyers, but many have reduced wings and are flightless. Consumption of fruit reduces the likelihood of exposure to the environment.
Presence of natural barriers		
Potential for movement		
Intended use		
Potential natural enemies in PRA areas		
	Spread likelihood	<b>Very low</b>
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a regional level – D
Direct effects on environment		Minor significance on a regional level – C
Control and eradication		Significant on a regional level – D
Domestic trade		Minor significance on a national level – D
International trade		Unlikely to be discernible on a national level – A
Indirect effects on environment		Significant on a regional level – D
<b>Potential economic consequences</b>		<b>Moderate</b>
<b>Unrestricted risk estimate</b>		<b>Negligible</b>

## ***Cholus zonatus* – Weevil [Coleoptera: Curculionidae]**

<b>Step</b>	<b>Rating</b>	<b>Justification</b>
<b>ENTRY – importation</b>		
Source orchard		Based on family characteristics, adults and larvae may attack fruit.
Packinghouse		Washing, sorting and grading likely remove external feeding individuals. Presence of rotting would increase likelihood of detection of infested fruit. Adults and larvae are conspicuous and could be detected during inspection.
Storage and transport		Adults may survive storage and transport.
On-arrival inspection		Adults and larvae are conspicuous and could be detected during inspection.
Entry importation likelihood	Very low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and larvae may survive storage and transport.
Infested-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Small host range (coconuts and pineapples).
Suitability of the environment		
Potential for adaptation of pest		
Reproductive strategy of pest		Many weevils are parthenogenetic with males unknown or rarely produced.
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Most weevils are able flyers, but many have reduced wings and are.
Presence of natural barriers		
Potential for movement		
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a regional level - D
Direct effects on environment		Minor significance on a regional level - C
Control and eradication		Significant on a regional level as no information on control of this pest - D
Domestic trade		Minor significance on a national level - D
International trade		Unlikely to be discernible on a national level - A
Indirect effects on environment		Significant on a regional level - D
<b>Potential economic consequences</b>		<b>Moderate</b>
<b>Unrestricted risk estimate</b>		<b>Negligible</b>

***Cotinis mutabilis* – Fig beetle [Coleoptera: Scarabaeidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Adults feed on fruit and larvae damage roots.
Packinghouse		Washing, sorting and grading likely remove external feeding individuals. Adults are conspicuous and could be detected during inspection.
Storage and transport		Adults may survive storage and transport.
On-arrival inspection		Adults are conspicuous and could be detected during inspection.
Entry importation likelihood	Very low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Host range includes many economically important crops eg. figs, grapes, peaches.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia
Potential for adaptation of pest		
Reproductive strategy of pest		
Method of pest survival		
Cultural practices & control measures		Chemical control programs for other Lepidopteran pests of pineapple may also be effective against this species. Adults are attracted to traps containing chemicals from pineapple.
Establishment likelihood	Very low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Occurs in a range of countries with similar environments to Australia.
Presence of natural barriers		
Potential for movement		Adults are strong fliers.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a national level - E
Direct effects on environment		Minor significance on a national level - D
Control and eradication		Minor significance on a regional level (trapping possible) - C
Domestic trade		Significant on a national level - E
International trade		Significant on a national level - E
Indirect effects on environment		Minor significance on a national level - D
<b>Potential economic consequences</b>		Extreme
<b>Unrestricted risk estimate</b>		<b>Low</b>

***Cryptophlebia leucotreta* – False codling moth [Lepidoptera: Tortricidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Eggs are deposited on fruits and larvae are found in fruit of many hosts.
Packinghouse		Washing, sorting and grading likely remove external eggs and larvae. Presence of secondary rotting would increase likelihood of detection of infested fruit.
Storage and transport		Eggs and larvae are unlikely to survive storage and transport.
On-arrival inspection		Larvae are conspicuous and would be easily detected by inspection, but the eggs are small and translucent white, and would be harder to detect.
Entry importation likelihood	Very low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Eggs and larvae may survive storage and transport.
Infested-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Very low	
Overall entry likelihood	Extremely low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Recorded feeding on over 50 plant species.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia
Potential for adaptation of pest		
Reproductive strategy of pest		Each female is capable of laying between 100–400 eggs.
Method of pest survival		Cold weather delays development, reduces fertility and with low humidity, increases egg mortality.
Cultural practices & control measures		Control can be difficult due to reinfestation but chemical control programs for other Lepidopteran pests of pineapple may also be effective against this species.
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		This species is uncommon in areas with a long dry season, possibly due to the fact this species has no diapause stage. This species must breed continuously to survive.
Presence of natural barriers		
Potential for movement		Adult can fly, but no information on flight time or distance.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		High percentage of eggs reported as parasitised by wasp egg parasites in South Africa eg. Trichogrammatoidea.
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Highly significant on a national level - F
Direct effects on environment		Significant on a national level - E
Control and eradication		Significant on a regional level - E
Domestic trade		Significant on a national level - E
International trade		Significant on a national level - E
Indirect effects on environment		Significant on a national level - E
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

## ***Dysmicoccus grassii* – Mealybug [Hemiptera: Pseudococcidae]**

<b>Step</b>	<b>Rating</b>	<b>Justification</b>
<b>ENTRY – importation</b>		
Source orchard		Based on family characteristics, generally feed on leaves and fruit.
Packinghouse		Washing, sorting and grading to likely remove adults and crawlers.
Storage and transport		Adults and crawlers may survive storage and transport.
On-arrival inspection		Adults and crawlers may hide in the cracks of the pineapple fruit, making detection by inspection difficult.
Entry importation likelihood	Low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and crawlers may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Host range includes a few economically important crops eg. cocoa, coffee.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia.
Potential for adaptation of pest		
Reproductive strategy of pest		Based on family characteristics has a moderate-high reproductive potential.
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Heavy rain is likely to cause increased mortality, especially first-instar crawlers.
Presence of natural barriers Potential for movement		Based on family characteristics, first-instar crawlers can be dispersed over considerable distances by wind. Disperse via wandering, and the transfer of crawlers on human clothing, mammal hair and bird plumage.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a national level - E
Direct effects on environment		Minor significance on a national level - D
Control and eradication		Significant on a regional level - D
Domestic trade		Minor significance on a national level - D
International trade		Minor significance on a national level - D
Indirect effects on environment		
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

***Dysmicoccus neobrevipes* – Pineapple mealybug [Hemiptera: Pseudococcidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Populations are mostly confined to actively growing plant parts eg. leaves and developing fruit. Populations decline rapidly as fruit and foliage approach maturity.
Packinghouse		Washing, sorting and grading likely to remove adults and crawlers.
Storage and transport		Adults and crawlers may survive storage and transport.
On-arrival inspection		Adults and crawlers may hide in the cracks of the pineapple fruit, making detection by inspection difficult.
Entry importation likelihood	Very low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and crawlers may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Very wide host range.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia.
Potential for adaptation of pest		
Reproductive strategy of pest		Each female is capable of producing up to 350 larvae and can live for 95 days.
Method of pest survival		
Cultural practices & control measures		In Hawaii, attempts to use natural enemies to control mealybugs have been unsuccessful unless ants were also controlled.
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Heavy rain is likely to cause increased mortality, especially first-instar crawlers.
Presence of natural barriers Potential for movement		First-instar crawlers can disperse up to several hundred yards on the wind. The ants that tend and encourage this mealybug are common in eastern and northern Australia.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		In Hawaii, attempts to use natural enemies to control mealybugs have been unsuccessful unless ants were also controlled.
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Highly significant on a national level - F
Direct effects on environment		Significant on a national level. Principle vector of pineapple wilt disease - E
Control and eradication		Significant on a regional level - D
Domestic trade		Significant on a national level - E
International trade		Significant on a national level - E
Indirect effects on environment		
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

## ***Fusarium subglutinans* – Fusariosis, fruitlet core rot**

<b>Step</b>	<b>Rating</b>	<b>Justification</b>
<b>ENTRY – importation</b>		
Source orchard Packinghouse		Internal symptoms would not be detectable on farm. Infection may be externally symptomless (smooth Cayenne pineapples) or the skin of infected fruitlets may remain green (rough leaf pineapples).
Storage and transport On-arrival inspection		
	Entry importation likelihood	High
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit Infected-infested fruit waste Distribution of infected/infested waste to environment Transfer to a susceptible host in endangered area		Internal symptoms would not be detectable. Infected fruits are likely to be discarded rather than consumed.  Range of hosts available, spread possible via soil, infected host material or insect vectors
	Entry – distribution likelihood	High
	Overall entry likelihood	High
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts Suitability of the environment Potential for adaptation of pest		Can infect a range of horticultural, forestry and broad acre plants Closely related fungi occur in Australia. Considerable range of virulence and host specialisation has been reported.
Reproductive strategy of pest Method of pest survival		Fungal pathogen so only a single propagule is required. Fungal propagules can survive in soil and in infected plant material.
Cultural practices & control measures		Control of a similar disease is not standard in Queensland production. Resistance can vary between cultivars..
	Establishment likelihood	Moderate

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		
Presence of natural barriers		
Potential for movement		Survives on propagative plant parts (suckers, slips and crown) and humans are the most efficient means of spread by moving infected plant material. Contaminated soil is not important for spread; spread within planting areas by wind, rain splash and insects.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Low
<b>Overall probability of entry, establishment &amp; spread</b>	<b>Low</b>	
Plant health or loss		Highly significant on regional level - E
Direct effects on environment		Significant on a regional level - D
Control and eradication		Significant on regional level - D
Domestic trade		Significant on a regional level - D
International trade		Minor significance on a national level - D
Indirect effects on environment		Minor significance on a regional level - C
<b>Potential economic consequences</b>	<b>High</b>	
<b>Unrestricted risk estimate</b>	<b>Moderate</b>	

***Melanaspis bromeliae* – Brown pineapple scale [Hemiptera: Diaspididae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Based on family characteristics, generally feed on leaves and fruit.
Packinghouse		Washing, sorting and grading likely to remove crawlers but adults may be harder to remove as they are protected by a hard shell.
Storage and transport		Adults and crawlers may survive storage and transport.
On-arrival inspection		Adults and crawlers may hide in the cracks of the pineapple fruit, making detection by inspection difficult.
Entry importation likelihood	Low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and crawlers may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Very low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Only reported on pineapple.
Suitability of the environment		
Potential for adaptation of pest		
Reproductive strategy of pest		Based on family characteristics, moderate-high reproductive potential.
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Based on family characteristics, first-instar crawlers can be dispersed over considerable distances by wind. Disperse via wandering, and the transfer of crawlers on human clothing, mammal hair and bird plumage.
Presence of natural barriers		
Potential for movement		
Intended use		
Potential natural enemies in PRA areas		Consumption of fruit reduces the likelihood of exposure to the environment.
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Minor significance on a regional level - C
Direct effects on environment		Minor significance on a national level - D
Control and eradication		Significant on a regional level - D
Domestic trade		Minor significance on a national level - D
International trade		Minor significance on a national level - D
Indirect effects on environment		
<b>Potential economic consequences</b>		<b>Moderate</b>
<b>Unrestricted risk estimate</b>		<b>Negligible</b>

***Melanoloma canopilosum* – Pineapple fruit fly [Diptera: Richardiidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Adults oviposit on fruit. Larvae burrow into the fruit, causing cavities that grow and coalesce.
Packinghouse		Washing, sorting and grading likely to remove eggs and possibly larvae. Potential for fruit to develop discoloured spots on the skin due to damage caused by larvae increases the likelihood of detection of infested fruit during inspection.
Storage and transport		Eggs and larvae may survive storage and transport.
On-arrival inspection		Potential for fruit to develop discoloured spots on the skin due to damage caused by larvae increases the likelihood of detection of infested fruit during inspection. Eggs would be harder to detected by inspection
Entry importation likelihood		Very low
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Eggs and larvae may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood		Very low
Overall entry likelihood		Extremely low
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Only reported on pineapple.
Suitability of the environment		
Potential for adaptation of pest		
Reproductive strategy of pest		
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood		Low

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		
Presence of natural barriers		
Potential for movement		Adults can fly.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Minor significance on a regional level - C
Direct effects on environment		Minor significance on a national level - D
Control and eradication		Significant on a regional level - D
Domestic trade & International trade		Minor significance on a national level - D
Indirect effects on environment		Minor significance on a national level - D
<b>Potential economic consequences</b>		<b>Moderate</b>
<b>Unrestricted risk estimate</b>		<b>Negligible</b>

**Melanoloma viatrix – Fly [Diptera: Richardiidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Larvae are found between the skin and fleshy part of the fruit, in some cases they have been found in areas near the heart of the fruit. Larvae develop inside the fruit.
Packinghouse		Washing, sorting and grading would not remove the larvae if it were inside the fruit. Infested fruit ripen unevenly (non-uniform) and would be detected during sorting, grading and inspection.
Storage and transport		Larvae may survive storage and transport.
On-arrival inspection		Damage caused by larvae visible as uneven (non-uniform) fruit ripening. Larvae would be difficult to detect during by inspection but the damage caused by them could be detected.
Entry importation likelihood	Very low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Larvae may survive storage and transport.
Infested-infested fruit waste		
Distribution of infested/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Very low	
Overall entry likelihood	Extremely low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Only reported on pineapple.
Suitability of the environment		
Potential for adaptation of pest		
Reproductive strategy of pest		Sexual reproduction.
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		
Presence of natural barriers		
Potential for movement		Adults can fly.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a regional level - D
Direct effects on environment		Minor significance on a national level - D
Control and eradication		Significant on a regional level - D
Domestic trade & International trade		Minor significance on a national level - D
Indirect effects on environment		Minor significance on a national level - D
	<b>Potential economic consequences</b>	<b>High</b>
<b>Unrestricted risk estimate</b>		<b>Very low</b>

***Paracoccus marginatus* – Papaya mealybug [Hemiptera: Pseudococcidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Recorded feeding on fruit in general.
Packinghouse		Washing, sorting and grading likely to remove adults and crawlers.
Storage and transport		Adults and crawlers may survive storage and transport.
On-arrival inspection		Adults and crawlers may hide in the cracks of the pineapple fruit, making detection by inspection difficult.
Entry importation likelihood	Low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and crawlers may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Wide host range.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia.
Potential for adaptation of pest		
Reproductive strategy of pest		Based on family characteristics has high reproductive potential and there may be as many as 15 generations per year.
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		This species does not tolerate cold conditions. Heavy rain is likely to cause increased mortality, especially first-instar crawlers.
Presence of natural barriers Potential for movement		First-instar crawlers disperse short distances by walking. Those on exposed parts of the plant may be carried to other hosts over greater distances by gusts of wind. Disperse via the transfer of crawlers on human clothing, mammal hair and bird plumage, or vehicles moving through a crop.
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		The presence of ants can deter natural enemies from attacking the mealybugs.
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a national level - E
Direct effects on environment		Minor significance on a national level - D
Control and eradication		Significant on a national level - E
Domestic trade & International trade		Minor significance on a national level - D
Indirect effects on environment		Minor significance on a national level - D
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

***Phenacoccus hargreavesi* – Mealybug [Hemiptera: Pseudococcidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Based on family characteristics, generally feed on leaves and fruit.
Packinghouse		Washing, sorting and grading likely to remove adults and crawlers.
Storage and transport		Adults and crawlers may survive storage and transport.
On-arrival inspection		Adults and crawlers may hide in the cracks of the pineapple fruit, making detection by inspection difficult.
Entry importation likelihood	Low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and crawlers may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		Limited information available on host range.
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Limited information available on host range.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia.
Potential for adaptation of pest		
Reproductive strategy of pest		Based on family characteristics has a moderate-high reproductive potential.
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Heavy rain is likely to cause increased mortality, especially first-instar crawlers.
Presence of natural barriers		Based on family characteristics, first-instar crawlers can be dispersed over considerable distances by wind. Disperse via wandering, and the transfer of crawlers on human clothing, mammal hair and bird plumage.
Potential for movement		
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a national level - E
Direct effects on environment		Minor significance on a national level - D
Control and eradication		Significant on a national level - E
Domestic trade & International trade		Minor significance on a national level - D
Indirect effects on environment		Minor significance on a national level - D
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

***Planococcoides njalensis* – West African cocoa mealybug [Hemiptera: Pseudococcidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Based on family characteristics, generally feed on leaves and fruit.
Packinghouse		Washing, sorting and grading likely to remove adults and crawlers.
Storage and transport		Adults and crawlers may survive storage and transport.
On-arrival inspection		Adults and crawlers may hide in the cracks of the pineapple fruit, making detection by inspection difficult.
Entry importation likelihood	Low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and crawlers may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Host range includes a few economically important crops eg. avocado, cocoa, coffee, mango.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia.
Potential for adaptation of pest		
Reproductive strategy of pest		Sexual and parthenogenetic reproduction. Fecundity ranges from 54–129 offspring (mated ?) and 24–90 offspring (unmated ?).
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Heavy rain is likely to cause increased mortality, especially first-instar crawlers.
Presence of natural barriers		First-instar crawlers disperse along interlocking tree canopies. Crawlers can walk at 4.5 cm a minute and cover at least 8 m if necessary. Active at temperatures above 23°C. Ants carry mealybugs over short distances (6 ft or less) only. Naturally spread by wind currents, especially during dry months.
Potential for movement		
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a national level - E
Direct effects on environment		Significant on a national level - E
Control and eradication		Significant on a national level - E
Domestic trade & International trade		Significant on a national level - E
Indirect effects on environment		Significant on a national level - E
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

***Pseudococcus jackbeardsleyi* – Jack Beardsley mealybug [Hemiptera: Pseudococcidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Based on family characteristics, generally feed on leaves and fruit.
Packinghouse		Washing, sorting and grading likely to remove adults and crawlers.
Storage and transport		Adults and crawlers may survive storage and transport.
On-arrival inspection		Adults and crawlers may hide in the cracks of the pineapple fruit, making detection by inspection difficult.
Entry importation likelihood	Low	
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Adults and crawlers may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood	Low	
Overall entry likelihood	Very low	
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Very wide host range.
Suitability of the environment		Occurs in a range of countries with similar environments to Australia.
Potential for adaptation of pest		
Reproductive strategy of pest		Based on family characteristics, moderate-high reproductive potential.
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood	Low	

Step	Rating	Justification
<b>SPREAD</b>		
Suitability of the environment for spread		Heavy rain is likely to cause increased mortality, especially first-instar crawlers.
Presence of natural barriers		
Potential for movement		
Intended use		Consumption of fruit reduces the likelihood of exposure to the environment.
Potential natural enemies in PRA areas		
	Spread likelihood	Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a national level. E
Direct effects on environment		Minor significance on a national level. D
Control and eradication		Significant on a national level. E
Domestic & International trade		Minor significance on a national level. D
Indirect effects on environment		Minor significance on a national level. D
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

***Strymon megarus* – Pineapple fruit borer [Lepidoptera: Lycaenidae]**

Step	Rating	Justification
<b>ENTRY – importation</b>		
Source orchard		Females are known to oviposit on small, young pineapple fruit. Larvae complete development within the fruit. Burrowing and feeding activities produce visible damage in the form of frass production and a sticky, gummy exudate.
Packinghouse		Washing, sorting and grading likely to remove larvae. Presence of damage caused by larvae (frass and a sticky, gummy exudate) increases the likelihood that infested fruit would be detected during inspection.
Storage and transport		Larvae may survive storage and transport.
On-arrival inspection		Presence of damage caused by larvae (frass and a sticky, gummy exudate) increases the likelihood that infested fruit would be detected during inspection. Larvae would be harder to detect during inspection, especially if developing inside the fruit.
Entry importation likelihood		Low
<b>ENTRY – distribution</b>		
Storage & distribution of imported fruit		Larvae may survive storage and transport.
Infected-infested fruit waste		
Distribution of infected/infested waste to environment		
Transfer to a susceptible host in endangered area		
Entry – distribution likelihood		Low
Overall entry likelihood		Very low

Step	Rating	Justification
<b>ESTABLISHMENT</b>		
Availability, quantity & distribution of hosts		Host range includes a few economically important crops eg. capsicum, mango, potato. Occurs in a range of countries with similar environments to Australia.
Suitability of the environment		
Potential for adaptation of pest		Newly emerged females have the potential of developing 150 eggs and the life cycle is completed in 28–32 days. Many flights occur all year in Hawaii and Mexico.
Reproductive strategy of pest		
Method of pest survival		
Cultural practices & control measures		
Establishment likelihood		Low
<b>SPREAD</b>		
Suitability of the environment for spread		Adults can fly. Many flights occur all year in Hawaii and Mexico. Consumption of fruit reduces the likelihood of exposure to the environment.
Presence of natural barriers		
Potential for movement		
Intended use		
Potential natural enemies in PRA areas		
Spread likelihood		Very low
<b>Overall probability of entry, establishment &amp; spread</b>		<b>Extremely low</b>
Plant health or loss		Significant on a national level. E
Direct effects on environment		Minor significance on a national level. D
Control and eradication		Significant on a national level. E
Domestic & International trade		Minor significance on a national level. D
Indirect effects on environment		Minor significance on a national level. D
<b>Potential economic consequences</b>		<b>Extreme</b>
<b>Unrestricted risk estimate</b>		<b>Low</b>

