



Chapter 4

Border biosecurity

The Department of Agriculture and Water Resources has primary responsibility for international border biosecurity activities, to restrict the import of items that pose a risk to Australia.



Restrictions at the border

Live animals and plants, packaging, plant material, animal products and certain food from overseas could introduce some of the world's most damaging pests and diseases into Australia. This could devastate our valuable agriculture and tourism industries and unique environment.

With increasing levels of international travel and trade, the detection of threats at the border remains an important element of the biosecurity system.

The Department of Agriculture and Water Resources employs officers at the border to focus on:

- Screening and inspecting international vessels, passengers, cargo, mail, animals, plants and plant products arriving in Australia.
- Managing the high biosecurity risks of live plants and animals through containment, observation and treatment at quarantine facilities.
- Identifying and evaluating the specific biosecurity risks facing northern Australia through the Northern Australia Quarantine Strategy (NAQS).
- Raising awareness of Australia's biosecurity requirements among travellers, importers and industry operators.

Activities at the border are risk-based, informed by evidence and subject to review and continual improvement.

SCREENING AND INSPECTION

The Department of Agriculture and Water Resources employs more than 3,900 officers, many of whom contribute to the inspection of international vessels and passengers, cargo and mail for biosecurity risks as they arrive at airports, seaports and mail centres. Officers operate in conjunction with the Department of Home Affairs, which polices people movements and intercepts illegal goods, such as drugs and weapons.

Australia has strict laws relating to the importation of certain goods, including goods brought back from overseas by travellers, to reduce the chance of an exotic pest incursion.

All goods need to be declared whether they are being brought back from overseas or arriving in the mail. The Department of Agriculture and Water Resources uses sophisticated risk assessment and intelligence tools to assess biosecurity risk and respond appropriately.

Screening passengers

In an effort to intercept risk material from being brought in from overseas, when travelling to Australia, passengers are provided with an Incoming Passenger Card by the crew on the aircraft or cruise vessel.



Image courtesy of the Department of Home Affairs

The Incoming Passenger Card is a legal document and must be completed correctly. Passengers must declare if they are carrying certain food, plant material or animal products.

Declared goods can be taken to the clearance point where they will be assessed by a Biosecurity Officer.

Alternatively, goods such as food, plant material or animal items can be voluntarily disposed of in bins located in the terminal.

Biosecurity Officers will assess the level of biosecurity risk associated with the declared goods. Passengers may be required to provide information or documents to assist in determining the risk. Biosecurity Officers also refer to the department's import conditions database, BICON.

Some products may require treatment such as fumigation or irradiation to make them safe. Other goods may not be allowed into the country if the risk is too great.

Biosecurity officers can also inspect baggage when passengers do not declare any goods. If arriving passengers are found to have made a false declaration on the Incoming Passenger Card, they can be penalised under the *Biosecurity Act 2015*.

Screening mail

When goods arrive at the Australian border they are assessed for biosecurity risk and a decision is made on whether they can be imported.

When sending mail to Australia, the contents of any packages must be accurately declared on a postal declaration. Biosecurity officers assess the risk based on the declaration and use detector dogs and x-ray machines to check packages.

Some goods may require treatment (at the importer's expense) before they are permitted into Australia. Goods that are not permitted into Australia will be forfeited to the Australian Government and destroyed. If any attempt has been made to conceal goods, the importer may be subject to an investigation and possible criminal prosecution.

ACTIVITIES TO DEAL WITH RISKS POSED BY CARGO IMPORTS

The Australian Government works with the cargo and shipping industries to prevent pests and diseases being imported with cargo. Biosecurity restrictions on imported goods can be complex. People who wish to import goods are advised to check whether the goods will be allowed to enter. Sometimes the treatments will be more costly and time consuming than the goods are worth.

First time or infrequent importers are encouraged to use the services of a licensed customs broker to facilitate the process.

BICON, the Australian Government's Biosecurity Import Conditions database, holds information on requirements for foreign plant, animal, mineral and human commodities. People wishing to bring in goods can check the conditions of entry on the Department of Agriculture and Water Resources website.

The information available on BICON is the same information that biosecurity officers use when inspecting goods arriving in Australia. Import conditions within BICON are regularly reviewed, so importers need to check the conditions each time they travel or send goods. More information on import risk assessment is in Chapter 3.



Detector dogs

Department of Agriculture and Water Resources detector dogs have played a key role in helping to protect Australia from exotic pests and diseases since 1992. They are used in conjunction with a number of other biosecurity strategies and detection technologies.

Detector Dog Program Operations has approximately 40 dogs operating in international airports, seaports, mail centres and courier depots throughout Australia. Most detector dogs are Labradors, a breed of dog with ideal characteristics for the job. They have an extraordinary sense of smell, are co-operative and gentle with people and possess extreme hunt, food and retrieve drives.

Detector dogs are trained to find items that could bring pests or diseases into Australia such as certain food, plant material and animal products. They have a working life of about six to eight years, and on average, find between 3,000 and 3,500 biosecurity risk items during their working life.

There are two types of detector dogs:

- Passive response detector dogs are trained to sit in the presence of target odours. They are rewarded with food or praise from their handler when they find biosecurity risk material. Passive response detector dogs generally work among the public at international passenger terminals.
- Multi-purpose detector dogs are trained to deliver the appropriate response in the environment in which they are operating. At an international passenger terminal, they will sit beside a passenger or piece of baggage. When scanning objects in mail facilities and private depots they will dig at the source of target odour.



Unusual interceptions at the border

In 2017, around 12 million mail items and four million passengers were screened, and one million cargo consignments were assessed.

Some 3,500 infringement notices were issued for items posing a risk to Australian biosecurity, including plants and seeds, whole fresh fish, dried lizards, frogs and spiders.

Biosecurity officers at the Sydney Mail Centre uncovered a snail when they came across 13 live *Helix pomatia* snails in packages sent from the Ukraine.

The snails, commonly known as Roman snails, were most likely intended for the food industry – where they and their progeny would be eaten by gourmet diners. But had they gotten loose, snails like these can breed rapidly and in great numbers, and an established population could cause huge damage to Australia's agricultural industries and precious environment.

Another recent interception was a parcel containing seeds and fertiliser posted from France. The items had been collected at the famous Chelsea Flower Show in Britain. One of the seed packets was permitted entry but three others and a sample of fertiliser were destroyed.

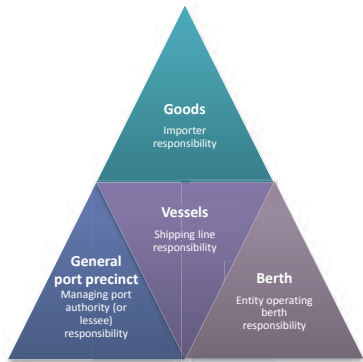
Pests and diseases associated with imported seeds pose a high risk to Australian agriculture, flora and fauna.



Snails may seem like slow movers, but they can breed rapidly and in great numbers. Images courtesy of Pest and Diseases Image Library, Bugwood.org

First point of entry biosecurity

Figure 85. Entity responsibility for biosecurity risks, first points of entry (ports)



Biosecurity at ports and other first points of entry is shared between stakeholders. Image courtesy of the Department of Agriculture and Water Resources

First point of entry (FPoE) refers to sea ports and airports that accept arrivals from overseas. FPoE operators and staff are in a unique position to notice biosecurity risks and respond to them. The Australian Government works with FPoE authorities, operators and workers to reduce biosecurity risks.

Operators and authorities are required to have facilities, arrangements and systems in place to manage the risk of pests and diseases entering, spreading and establishing. The requirements for FPoE authorities and operators are listed in the First Point of Entry Biosecurity Standards for both landing places and ports. For example, seaports must keep wharves free of vegetation and manage weeds so that they do not flower or spread.

Rubbish, such as old tyres and packaging, must not be left lying around the wharf area as it can

create pools of water and attract pests. Baits are put out in the area for rodents and feral animals and FPoE authorities and operators must manage pools of water that might harbour mosquitos, and if necessary, treat any water to prevent breeding of vectors of pests and diseases.

The Australian Government has set up the See. Secure. Report. Hotline (1800 798 636) for FPoE workers to report any biosecurity risks they find during day-to-day operations.

Staff are required to report any hitchhiker pests found on or in vessels and containers or non-containerised cargo. Any unwanted goods from a vessel or cargo consignment – whether packaging, weeds, soil, straw, food scraps, contaminated or spilled goods – are considered waste goods subject to biosecurity control. Staff are required to dispose of waste goods in biosecurity bins, rather than ordinary garbage bins.

Timber dunnage (loose wood, matting, or similar material that is used to keep a cargo in position in a ship's hold) and packaging can carry a variety of borers, beetles, ants and termites. Workers at FPoE are asked to report any evidence of the presence of a timber pest such as frass or sawdust piles under dunnage or imported timber, and tracks or holes in the timber that are signs that exotic timber pests are present.

The special responsibilities of FPoE authorities, operators and staff are an example of the biosecurity responsibilities of everyday Australians (see Figure 85).

NATIONAL BORDER SURVEILLANCE PROGRAM

The National Border Surveillance Program commenced in late 2016 and operates under the policy direction of the Compliance Division within the Department of Agriculture and Water Resources. National border surveillance teams are located in all major Australian mainland ports (see Figure 86).

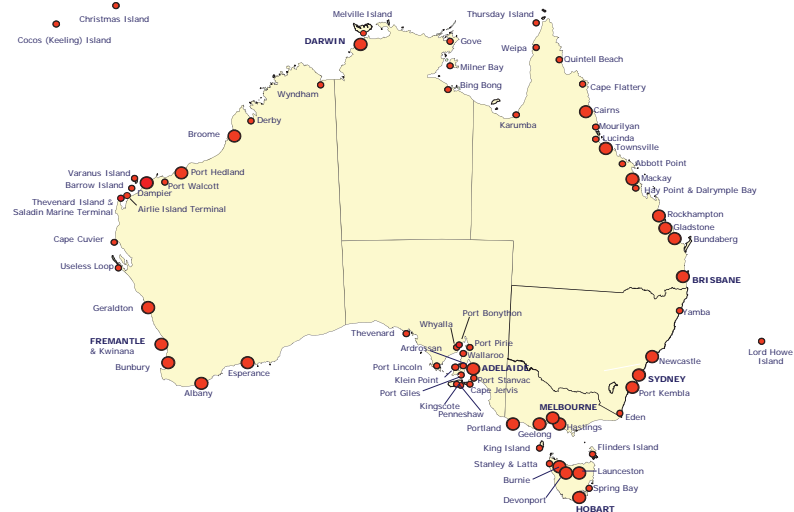
The teams' scope of work includes plant health surveillance at all Australian first points of entry (seaports and airports), premises of businesses handling imported goods of biosecurity interest or biosecurity risk material (so-called Approved Arrangements), and areas associated with or surrounding these.

The primary focus of the border surveillance program is the early detection of pest organisms – that may have escaped from conveyances, containers, goods or passengers at the border – before they have the chance to spread to production areas.

Teams also work to check that no incursions have occurred when an exotic pest is detected at the border and to search for pests in emergency responses.

Data from the teams is also used to inform biosecurity policy areas for the review of import conditions and requirements for Approved Arrangements.

Figure 86. Ports of Australia



Stakeholders implement biosecurity activities at ports all around Australia's coast. Image courtesy of Ports Australia

Protecting our northern coastline – Northern Australia Quarantine Strategy

The unique biosecurity threats in Australia's north – stretching from Cairns in Queensland to Broome in WA and including the Torres Strait – have been managed by the Department of Agriculture and Water Resources through its Northern Australia Quarantine Strategy (NAQS) since 1989.

The northern coastline is vast and sparsely populated. It faces biosecurity risks from countries in close proximity to Australia including Indonesia, Timor-Leste and Papua New Guinea. These countries have many pests, plant diseases and weeds not present in Australia, which could be spread by human activities as well as natural pathways.

NAQS delivers integrated activities to reduce risk through three main components: surveillance, location and cooperation.

Officers carry out surveillance for exotic pests, diseases and weeds, on horticultural plants as well as native and alternative cultivated hosts. Pest checks are made for nationally agreed target species as well as those identified as High Priority Pests during biosecurity planning for industries. In addition, reports of damage symptoms on host plants are investigated. Increasingly, surveillance is conducted in partnership with industry and other government partners.

Each year NAQS notifies relevant authorities of four or five pests that are either new records or new distributions. This intelligence improves national and local incursion responses and aids in determining plant pest status across the north.

In the Torres Strait, department officers manage risks associated with the southwards movement of people, vessels, aircraft and goods through the Strait to mainland Australia. This includes traditional visitors from Papua New Guinea under the Torres Strait Treaty – up to 30,000 movements.

Officers regulate plant risks associated with movements of goods and conveyances through the islands. Regulated pathways are from the Torres Strait Protected Zone to the Permanent Biosecurity Monitoring Zone, and from either zone to mainland Australia, as shown in Figure 87.

Figure 87. Biosecurity risk pathways regulated by NAQS



Most importantly, the success of surveillance and regulatory activities is due to the cooperation and good will of people in northern Australia. The strategy invests heavily in community engagement including the well-known campaign 'Top Watch' to create strong community support. As a result, biosecurity awareness is high and local communities engage with the strategy. They comply with requirements in the Torres Strait, report unusual pests and diseases and provide access to land and country for surveillance.

The success of surveillance activities is due to the co-operation and good will of people in Northern Australia. Image courtesy of Vivien Attwood

Image courtesy of the Department of Agriculture and Water Resources

EXOTIC FRUIT FLY SURVEILLANCE AND ERADICATION

Exotic fruit fly species are one of the highest risks for Australia's horticultural industry with some, including Oriental and New Guinea fruit fly, present in Papua New Guinea. As part of the Torres Strait Fruit Fly Containment Strategy, NAQS works with industry, the Queensland Government and communities to conduct surveys and monitor traps.

Incursions are often detected in November and December in permanent traps on the northern islands of the Torres Strait. These known seasonal incursions are eradicated each year by the Department of Agriculture and Water Resources and the Queensland Government, under the auspices of the Emergency Plant Pest Response Deed. That means that potentially affected industry Parties pay a share of the cost of keeping these pests out of Australia. See Chapter 5 for more on the Emergency Plant Pest Response Deed.



A NAQS ranger checks a trap for exotic fruit flies. Image courtesy of the Department of Agriculture and Water Resources

Latest app technology for rangers

Seventy ranger groups that work across Australia's 10,000 kilometres of northern coastline now have the Ranger App on mobile devices to record checks for plant pests.

The Ranger App allows rangers to store surveillance data even when they're offline. The data they enter is submitted to a database when internet connectivity is restored.

The new system makes biosecurity data collection much more efficient.



NAQS rangers use a new app for plant pest data collection. Image courtesy of the Department of Agriculture and Water Resources

International experts gather to protect against *Xylella*

In May 2017, experts from across the globe gathered in Brisbane to share knowledge and strengthen Australia's defences against the nation's most unwanted exotic plant pest. The International Symposium on *Xylella fastidiosa* was attended by more than 100 delegates who heard from experts from all over the world.

Representatives from the United States, France, Italy and Taiwan shared their first-hand experience of the disease and its sap sucking insect vectors, with the audience who were from government, industry and research agencies in Australia, along with New Zealand, Japan, Myanmar, Tuvalu, Tonga, Timor-Leste, French Polynesia and Sri Lanka.

A key message arising from the symposium was that every Australian has a role to play in protecting plant industries and the environment from *Xylella*.

Presentations from the symposium are available on the Department of Agriculture and Water Resources website at agriculture.gov.au/pests-diseases-weeds/plant/xylella/international-symposium-xylella-fastidiosa.



Local and international delegates gather at Australia's first international *Xylella fastidiosa* symposium in May 2017. Image courtesy of the Department of Agriculture and Water Resources

Post-entry plant quarantine

Imported live plant material can introduce foreign plant pests and diseases, but it can be advantageous at times for growers to import new varieties, to help maintain the competitiveness and productivity of Australian agribusiness. As a result, live plants can be imported but are subject to conditions and risk assessment processes set by the Department of Agriculture and Water Resources. This includes new plant material spending time in post-entry quarantine facilities, allowing for growth and disease screening and testing to eliminate any disease concerns.

Live plant material is defined as all live plants or plant material, other than seeds, that is imported for the purposes of growth or propagation. Import conditions vary, depending on the genus and species of the plant and the form of the imported plant material.

Plant importers begin the process by checking import conditions using the Australian Government import database, BICON, and, if the species is allowed into Australia, apply for an import permit. The national plant protection organisation of the country of export will need to inspect the plants and issue a phytosanitary certificate prior to export. New species that have not previously been imported will be subject to a weed risk assessment, after which the department may choose to develop import conditions for the new species. Plant material classified by departmental officers as high risk will be taken directly to the government post entry quarantine facility at Mickleham in Victoria. Other nursery stock and restricted seeds can be grown and screened for pests at an approved facility (see Table 43).

The amount of time the plants spend in a post-entry quarantine facility depends on the biosecurity risks they pose and the specific testing required. Once all required testing and screening procedures have taken place and the plants are deemed to be free of any biosecurity concern, the department will release the goods to the importer, who covers all associated costs for services.

Table 43. Australia post-entry plant quarantine facilities

Location	Australian Government facilities	State government facilities approved for high-risk plant material	Scientific (S) and private (P) facilities approved for high-risk plant material	Private facilities approved for medium-risk plant material
ACT			1 (S), 1 (P)	1
NSW		1	2 (P)	13
Queensland		2	2 (P)	11
SA		1	1 (S)	19
Tasmania			1 (P)	10
Victoria	1	3		51
WA		1	2 (P)	14
NT				

Targeting the highest risk exotic plant pests

Identifying exotic threats and the ways in which they might make it into Australia can significantly increase the chance of containing and successfully eradicating them should they arrive.

Prioritising pests allows biosecurity activities, including surveillance, pathway analysis, and border screening and inspection, to target the most serious risks.

BIOSECURITY PLANNING TO DETERMINE HIGH PRIORITY PESTS

High Priority Pests are those assessed to pose the greatest threat to a particular plant industry or environmental species during biosecurity planning. High Priority Pests are exotic pests that could have a significant impact on production or trade should they establish in Australia, as well as some serious pests that are in Australia but confined to particular regions.

Biosecurity planning is a requirement for signatories to the Emergency Plant Pest Response Deed and biosecurity plans are generally developed by PHA, with funding secured by a Research and Development Corporation or by a plant industry peak body. The plans developed by PHA are listed in Table 44.

Planning is a key risk mitigation strategy that gives an industry the best chance of future viability and sustainability. A biosecurity plan consists of two main parts: a risk assessment of exotic pests and an implementation table outlining risk mitigation activities that industry and government can undertake to improve biosecurity preparedness.

To identify and prioritise exotic plant pests, experts from industry and government are brought together to form a Technical Expert Group for that crop. Pest risk assessment takes into account the pest's likelihood of entry, establishment and spread, as well as the economic impact if it established in Australia. The assessment includes all entry pathways including legal, illegal, accidental or through natural causes.

At the end of this process the exotic pests that pose the greatest risk with the largest potential economic impact for an industry are deemed to be High Priority Pests.

It is important to note that pest risk assessments differ from the Biosecurity Import Risk Analysis processes undertaken by the Department of Agriculture and Water Resources. Pest risk assessments consider all potential pathways including unregulated ways into the country. Biosecurity Import Risk Analysis is conducted for an individual import application under a specific circumstance, which might involve specified treatments or certification prior to import.

Once the High Priority Pests for an industry or crop have been identified, experts are gathered to form a Biosecurity Implementation Group, who develop and agree to risk mitigation measures for each pest, and general activities to improve biosecurity preparedness.



Biosecurity plans developed by PHA undergo formal reviews every four to five years to ensure they remain up-to-date, taking into consideration new research, incursions overseas and changes to potential pathways. New biosecurity plans also have an annual mini review by Biosecurity Reference Panels to help drive implementation of preparedness activities. For more on biosecurity planning, see Chapter 2.

At the end of this chapter (page 130), Table 46 lists all 370 high priority pests that have been identified from the 32 biosecurity plans developed by PHA, along with those listed in *schedule 13* of the *EPPRD*, which are known as pre-categorised pests. In Chapter 2, the High Priority Pests of each industry are listed.

Table 44. Current biosecurity plans covering Australia's plant industries

Biosecurity Plan	Biosecurity Plan	Biosecurity Plan
Apple and Pear BP (Version 3.0)	Lychee BP (Version 1.0)	Potato IBP (Version 2.0)
Avocado IBP (Version 2.01)	Mango IBP (Version 2.1)	Rice IBP (Version 3.0)
Banana IBP (Version 2.0)	Melon IBP (Version 1.0)	Rubus IBP (Version 1.0)
Blueberry BP (Version 1.0)	Nursery IBP (Version 3.0)	Strawberry IBP (Version 2.0)
Cherry IBP (Version 2.01)	Nuts BP (Version 3.0)	Sugarcane IBP (Version 3.0)
Citrus BP (Version 3.0)	Olive BP (Version 2.0)	Summerfruit IBP (Version 1.0)
Cotton BP (Version 3.0)	Onion IBP (Version 2.0)	Tomato BP (Version 1.0)
Cut Flower BP (Version 1.0)	Papaya IBP (Version 1.0)	Truffle BP (Version 1.0)
Ginger IBP (Version 1.0)	Passionfruit IBP (Version 1.0)	Vegetable IBP (Version 2.0)
Grains BP (Version 3.0)	Pineapple BP (Version 2.0)	Viticulture IBP (Version 3.0)
Honey Bee IBP (Version 1.0)	Plantation Forest IBP (Version 2.0)	

NATIONAL PRIORITY PLANT PESTS

In November 2016, a list of Australia's least wanted plant pests and diseases was released by the Department of Agriculture and Water Resources. The pests are listed in Table 45.

The list was derived from a comparative analysis of exotic pests considering:

- The possible ways they could enter Australia.
- The likelihood of them entering.
- Their ability to become established and spread.
- The consequences for businesses, human health and the environment if they do.

The bacterial disease *Xylella fastidiosa* topped the list. The pest has a huge host range, with hundreds of native, commercial and ornamental plant species at risk, so it could devastate horticultural crops, native flora and gardens. There is no treatment and no documented example of it ever being eradicated once it has become established. It could enter Australia with imported plant propagation material or with infected insects that can hitch a ride on anything that is imported.

The pest assessed as second worst is khapra beetle, a pest of stored grain. An incursion of khapra beetle would have a major impact on Australia's largest crop industry, grains, including threatening market access for our exports.

The beetle is small but tough: larvae are able to survive dormant for up to two years with very little to feed on. It can arrive in cargo, machinery, food or mail items, or be brought in by travellers in personal effects. Once here, it could spread easily through the movement of seed, straw, stored grain, cargo or machinery.

Khapra beetle larvae and adults were found in SA in 2016, but were detected quickly and confined to a number of warehouses in Adelaide and Kangaroo Island. The premises were fumigated to destroy the pest.

Exotic fruit flies, the world's most destructive horticultural pests, round out the top three. While Australia already has some fruit fly species, these highly damaging exotic species are kept out by ongoing biosecurity measures. Over 300 types of fruit and vegetables would be at risk from these fruit flies.

For more information on National Priority Plant Pests go to agriculture.gov.au/pests-diseases-weeds/plant/national-priority-plant-pests-2016.

Table 45. Australia's National Priority Plant Pests

National priority plant pests	National priority plant pests
<i>Xylella fastidiosa</i>	Sharka
Khapra beetle	Drywood termite
Exotic fruit flies	Subterranean termite
Karnal bunt	Citrus longhorn beetle
Huanglongbing or citrus greening	Red ring disease/pine wood nematode
Gypsy moth	Fusarium wilt
Tramp ants	Sugarcane stalk borer
Internal and external mites of bees	Black sigatoka
Giant African snail	Potato late blight
Brown marmorated stink bug	Sunn pest
Zebra chip	Western/tarnished plant bug
Ug 99 wheat stem rust	Exotic sawyer beetles
Russian wheat aphid (holocyclic form)	Burning moth
Citrus canker	European canker
Guava (Eucalyptus) rust	Dutch elm disease
Phytophthora blight	
Exotic bees	
Panama Tropical race 4	
Potato cyst nematode	
Leaf miners	
Fire blight	
Hessian fly/barley stem gall midge	
Texas root rot	
Wheat stem sawfly	
Golden apple snail	
Barley stripe rust	
Cereal cyst nematode	



Least wanted number three: melon fly (*Zeugodacus cucurbitae*). Image courtesy of Central Science Laboratory, Harpenden, British Crown, Bugwood.org

OTHER PLANT PESTS OF CONCERN

The Department of Agriculture and Water Resources also identifies the following list of other serious plant pests that may have a significant impact on growers, industries, Australia's environment and way of life.

- Citrus fruit borers (*Citripestis sagittiferella* and *Prays endocarpa*)
Hosts – Rutaceae, particularly citrus
- Exotic diseases of coconuts (phytoplasmas)
Hosts – coconut
- Mango pulp weevil (*Sternochaetus frigidus*)
Hosts – mango
- Pine pitch canker (*Fusarium circinatum*)
Hosts – Douglas fir, pines
- Sugarcane stem borers (*Chilo*, *Sesamia* and *Scirpophaga* spp.)
Hosts – sugarcane
- Lesser auger beetle (*Heterobostrychus aequalis*)
Hosts – timber in service, range of horticultural and tree crops, amenity plantings.

Targeting the least wanted pests through improved plant health surveillance



Through the Agricultural Competitiveness White Paper, the Department of Agriculture and Water Resources is working with Plant Health Australia, state and territory governments, industry and environmental groups, as well as the R&D sector, to strengthen surveillance for the national priority pests, from working with our near neighbours to conduct surveys and build biosecurity capacity to targeted industry surveillance strategies.

White Paper funding is also strengthening national surveillance activities for fruit flies and providing enhancements to the National Bee Pest Surveillance Program. For more information see Chapter 7.

A national priority pest – Airborne phytophthora, the plant destroyer



Phytophthora ramorum causes sudden oak death. Image courtesy of Joseph O'Brien, USDA Forest Service, Bugwood.org

Name: *Phytophthora ramorum*

Life form: Oomycete (fungus-like microorganism)

Origin: Asia

Distribution: North America and Europe

Symptoms: Leaf spots, stem cankers which often ooze smelly dark red sap, and dieback of the foliage which often results in the death of the tree.

Spread pathways: Spores in air and water, as well as on clothes and shoes, equipment, or animals plus plant trade and green waste.

At risk: Plantation forestry, nut industries, production nurseries, urban trees, native ecosystems.

Phytophthora species are pests of a wide range of trees, shrubs and herbaceous plants. Derived from Greek, the word phytophthora means 'plant destroyer'.

Phytophthora ramorum is best known for causing sudden oak death which is causing devastation in nurseries and woodland ecosystems throughout Europe and North America.

Sudden oak death is known to affect over 130 tree and shrub species and has killed millions of trees worldwide. Where the disease is established, some plant production industries, particularly the nursery industry, have been badly damaged.

The pest is highly invasive. Its rapid lifecycle, ability to spread by spores through wind and rain, and to survive harsh climatic conditions means it can spread and reproduce rapidly in new environments.

Testing suggests that iconic Australian native plants including species of *Eucalyptus*, *Leptospermum* and *Melaleuca* would be highly susceptible, making it a pest of particular concern to Australia.

In addition to damaging nut, forestry and nursery industries, *Phytophthora ramorum* would forever change the face of the Australian bush.

Table 46. High priority pest threats

Scientific name	Common name	High priority pest of
<i>Abaca bunchy top virus</i> (Babuvirus)	Abaca bunchy top virus	Banana
<i>Acarapis woodi</i>	Tracheal mite	Honey bee
<i>Acleris comariana</i>	Strawberry tortrix	EPPRD
<i>Adoxophyes orana</i>	Summer fruit tortrix	EPPRD
<i>Aleurolobus barodensis</i>	Sugarcane whitefly	Sugarcane, EPPRD
<i>Amyelois transitella</i>	Navel orangeworm	Nut, EPPRD
<i>Anastrepha ludens</i>	Mexican fruit fly	Citrus
<i>Anisogramma anomala</i>	Eastern filbert blight (hazelnut blight)	Truffle, Nut, EPPRD
<i>Anthonomus bisignatus</i>	Strawberry bud weevil	EPPRD
<i>Anthonomus grandis</i>	Cotton boll weevil	Cotton, EPPRD
<i>Aphis gossypii</i> (exotic strains)	Cotton aphid	Cotton, Production nurseries
<i>Apiosporina morbosa</i>	Black knot	EPPRD
<i>Apis cerana</i> (exotic strains, genotypes and sub-species)	Asian honey bee	Honey bee
<i>Apis mellifera capensis</i>	Cape honey bee	Honey bee
<i>Apis mellifera scutellata</i>	African honey bee	Honey bee
<i>Apis mellifera scutellata</i> (hybrid)	Africanised honey bee	Honey bee
<i>Aristobia testudo</i>	Lychee longicorn beetle	Lychee
<i>Arthuriomyces peckianus</i>	Orange rust (long-cycled)	Rubus
<i>Ascochyta rabiei</i> (MAT1-1 is endemic, MAT 1-2 is exotic)	Ascochyta blight	Grains
<i>Aspidiella hartii</i>	Yam scale (rhizome scale)	Ginger
<i>Avocado sunblotch viroid</i> (asymptomatic strains)	Avocado sunblotch	Avocado
<i>Avocado sunblotch viroid</i> (symptomatic strains)	Avocado sunblotch	Avocado
<i>Bactericera cockerelli</i>	Tomato potato psyllid	Tomato, Potato, EPPRD
<i>Bactrocera carambolae</i>	Carambola fruit fly	Avocado, Tomato, Citrus, Mango, Papaya, Passionfruit, Viticulture
<i>Bactrocera dorsalis</i>	Oriental fruit fly	Apple and Pear, Avocado, Tomato, Citrus, Lychee, Papaya, Passionfruit, Summerfruit, Viticulture, EPPRD

Scientific name	Common name	High priority pest of
<i>Bactrocera facialis</i>	Tropical fruit fly	Avocado, Tomato, Passionfruit
<i>Bactrocera invadens</i> (syn. <i>B. dorsalis</i>)	Fruit fly	Citrus, Melon
<i>Bactrocera kandiensis</i>	Fruit fly	Avocado, Citrus, Passionfruit
<i>Bactrocera kirki</i>	Fijian fruit fly	Avocado, Passionfruit
<i>Bactrocera latifrons</i>	Solanum fruit fly	Melon
<i>Bactrocera melanotus</i>	Fruit fly	Avocado, Passionfruit
<i>Bactrocera occipitalis</i>	Fruit fly	Citrus
<i>Bactrocera oleae</i>	Olive fly	Olive
<i>Bactrocera papayae</i> (syn. <i>B. dorsalis</i>)	Papaya fruit fly	Avocado, Citrus, Mango, Papaya, Passionfruit, Summerfruit, Viticulture, EPPRD
<i>Bactrocera passiflorae</i>	Fijian fruit fly	Avocado, Papaya, Passionfruit
<i>Bactrocera philippinensis</i> (syn. <i>B. dorsalis</i>)	Philippine fruit fly	Avocado, Citrus, Papaya, Passionfruit, EPPRD
<i>Bactrocera psidii</i>	South Sea guava fruit fly	Passionfruit
<i>Bactrocera trivialis</i>	New Guinea fruit fly	Citrus
<i>Bactrocera xanthodes</i>	Pacific fruit fly	Avocado, Passionfruit
<i>Banana bract mosaic virus</i> (Potyvirus)	Banana bract mosaic disease	Banana, EPPRD
<i>Banana bunchy top virus</i> (Nanovirus)	Banana bunchy top disease	Banana
<i>Barley mild mosaic virus</i> (Bymovirus)	Barley mild mosaic virus	Grains
<i>Bean common mosaic virus</i> (Potyvirus), peanut stripe strain	Bean common mosaic virus	Grains
<i>Bemisia tabaci</i> (biotypes other than B and AN)	Silverleaf whitefly	Cotton, Melon, Production nurseries
<i>Bemisia tabaci</i> (Types Asia 1, China 1, China 2, Asia II (1-8), Italy, Sub-Saharan Africa (1-4), Uganda, New World, Mediterranean, Middle East-Asia Minor 2, Indian Ocean)	Silverleaf whitefly	Tomato, Cotton, Melon, Production nurseries
<i>Blood disease bacterium</i>	Blood disease	Banana, EPPRD

Table 46. High priority pest threats (continued)

Scientific name	Common name	High priority pest of
<i>Botrytis squamosa</i>	Leaf blight	Onion
<i>Burkholderia caryophylli</i> (syn. <i>Pseudomonas caryophylli</i>)	Bacterial wilt of carnation	Cutflower
<i>Bursaphelenchus</i> spp. including <i>B. xylophilus</i>	Pinewood nematode species complex	Forestry
<i>Cacoecimorpha pronubana</i>	Carnation tortrix	Cutflower
<i>Caliothrips fasciatus</i>	Bean thrips	Citrus
<i>Candidatus Liberibacter africanus</i>	Huanglongbing (African strain)	Citrus
<i>Candidatus Liberibacter americanus</i>	Huanglongbing (American strain)	Citrus
<i>Candidatus Liberibacter asiaticus</i>	Huanglongbing (Asiatic strain)	Citrus, Production nurseries, EPPRD
<i>Candidatus Liberibacter solanacearum</i> (syn. <i>Candidatus Liberibacter psyllaureus</i>)	Zebra chip	Tomato, Potato, EPPRD
<i>Candidatus Phytoplasma pruni</i> (syn. X disease phytoplasma)	Peach X disease	Cherry, Summerfruit, EPPRD
<i>Candidatus Phytoplasma solani</i>	Bois noir	Viticulture
<i>Carposina sasakii</i>	Peach fruit moth, small peach fruit borer	Apple and Pear
<i>Cephus cinctus</i>	Wheat stem sawfly	Grains
<i>Cephus pygmeus</i>	European wheat stem sawfly	Grains
<i>Ceratocystis fimbriata</i> sensu lato	Mango sudden decline syndrome	Mango
<i>Ceratocystis manginecans</i>	Mango sudden decline syndrome	Mango
<i>Ceratocystis omanensis</i>	Mango sudden decline syndrome	Mango
<i>Ceratovacuna lanigera</i>	Sugarcane woolly aphid	Sugarcane
<i>Cercospora rubi</i>	Rosette	Rubus
<i>Ceutorhynchus assimilis</i> (syn. <i>Ceutorhynchus obstrictus</i>)	Cabbage seedpod weevil	Grains
<i>Ceutorhynchus napi</i>	Rape stem weevil	Grains
<i>Ceutorhynchus pallidactylus</i>	Cabbage stem weevil	Grains

Scientific name	Common name	High priority pest of
<i>Cherry leaf roll virus</i> (Nepovirus) (exotic strains)	Blackline	Cherry, Rubus, EPPRD
<i>Chickpea chlorotic dwarf virus</i> (Mastrevirus)	Chickpea chlorotic dwarf virus	Grains
<i>Chickpea chlorotic stunt virus</i> (Polerovirus)	Chickpea chlorotic stunt virus	Grains
<i>Chilo auricilius</i>	Sugarcane internode borer	Sugarcane
<i>Chilo infuscatellus</i>	Yellow top borer of sugarcane	Sugarcane
<i>Chilo orichalcociliellus</i>	Coastal stem borer	Grains
<i>Chilo partellus</i>	Spotted stem borer	Grains
<i>Chilo sacchariphagus</i>	Sugarcane internode borer	Sugarcane
<i>Chilo terrenellus</i>	Sugarcane stem borer	Sugarcane
<i>Chilo tumidicostalis</i>	Spotted sugarcane stem borer	Sugarcane
<i>Chinavia hilaris</i> (syn. <i>Chinavia hilare</i>)	Green stink bug	Nut
<i>Choristoneura rosaceana</i>	Oblique banded leaf roller	Cherry
<i>Chromatomyia horticola</i>	Pea leafminer	Cutflower
<i>Chrysoperthe austroafricana</i>	Eucalyptus canker disease	Forestry
<i>Ciborinia camelliae</i>	Camellia petal blight	EPPRD
<i>Citripestis sagittiferella</i>	Citrus fruit borer	Citrus
<i>Citrus leprosis virus</i> (unassigned)	Citrus leprosis disease	Citrus
<i>Citrus tristeza virus</i> (Closterovirus) (mandarin stem-pitting strain)	Mandarin stem-pitting	Citrus
<i>Cladosporium allii</i>	Leaf spot	Onion
<i>Clavibacter michiganensis</i> subsp. <i>sepedonicus</i>	Bacterial ring rot	EPPRD
<i>Colletotrichum truncatum</i> (lentil strain)	Lentil anthracnose	Grains
<i>Conopomorpha sinensis</i>	Lychee fruit borer	Lychee
<i>Conotrachelus aguacatae</i>	Small avocado seed weevil	Avocado
<i>Conotrachelus nenuphar</i>	Plum curculio	Cherry, Summerfruit, EPPRD
<i>Conotrachelus perseae</i>	Small seed weevil	Avocado
<i>Coptotermes formosanus</i>	Formosan subterranean termite	Forestry

Table 46. High priority pest threats (continued)

Scientific name	Common name	High priority pest of
<i>Coptotermes gestroi</i>	Asian subterranean termite	Forestry
<i>Cotinis mutabilis</i>	Fig beetle	Pineapple
<i>Cotton leaf curl virus</i> (Begomovirus)	Cotton leaf curl disease	Cotton, EPPRD
<i>Cotton leafroll dwarf virus</i> (Polerovirus)	Cotton blue disease	Cotton
<i>Croesia curvalana</i>	Blueberry leaf-tier	Blueberry
<i>Cryphonectria parasitica</i>	Chestnut blight	Nut, EPPRD
<i>Cryptosporella umbrina</i>	Brown rose canker	Cutflower
<i>Ctenopseustis obliquana</i>	Brown headed leaf roller	Cherry
<i>Cydia funebrana</i>	Plum fruit moth	Summerfruit
<i>Cydia inopinata</i> (syn. <i>Grapholita inopinata</i>)	Manchurian fruit moth	Apple and Pear
<i>Cylindrocopturus adpersus</i>	Sunflower stem weevil	Grains
<i>Daktulosphaira vitifoliae</i> (biotype B)	Grape phylloxera type B	EPPRD
<i>Daktulosphaira vitifoliae</i> (exotic strains)	Grapevine phylloxera	Viticulture
<i>Dasineura mali</i>	Apple leaf curling midge	Apple and Pear
<i>Deanolis sublimalis</i> (syn. <i>Noorda albizonalis</i>)	Red banded mango caterpillar (red banded borer)	Mango, EPPRD
<i>Deformed wing virus</i> (Iflavivirus)	Deformed wing virus	Honey bee
<i>Delia antiqua</i>	Onion fly	Onion
<i>Delia florilega</i>	Bean fly	Onion
<i>Dendroctonus ponderosae</i>	Mountain pine beetle	Forestry
<i>Dendroctonus valens</i>	Red turpentine beetle	Forestry
<i>Diabrotica barberi</i>	Northern corn root worm	Grains
<i>Diabrotica undecimpunctata</i>	Southern corn root worm	Grains
<i>Diabrotica virgifera</i>	Western corn root worm	Grains
<i>Diaphorina citri</i>	Asian citrus psyllid	Citrus, Production nurseries, EPPRD
<i>Diaporthe helianthi</i>	Sunflower stem canker	Grains
<i>Dickeya dianthicola</i> (syn. <i>Erwinia chrysanthemi</i> pv. <i>dianthicola</i>)	Slow wilt	Cutflower

Scientific name	Common name	High priority pest of
<i>Dickeya</i> spp. (pineapple infecting strains) syn. <i>Erwinia chrysanthemi</i>	Bacterial fruit collapse/ Bacterial heart rot	Pineapple
<i>Diuraphis noxia</i>	Russian wheat aphid	Grains, EPPRD
<i>Drosophila suzukii</i>	Spotted wing drosophila	Apple and Pear, Blueberry, Cherry, Rubus, Summerfruit, Viticulture
<i>Dryocosmus kuriphilus</i>	Oriental chestnut gall wasp	Nut
<i>Dysaphis plantaginea</i>	Rosy apple aphid	Apple and Pear, Summerfruit
<i>Dysdercus</i> spp. (including <i>D. honestus</i> , <i>D. maurus</i> , <i>D. suturellus</i> (American species))	Cotton stainer	Cotton
<i>Dysmicoccus neobrevipes</i>	Grey pineapple mealybug	Pineapple
<i>East Asian passiflora virus</i> (Potyvirus)	East Asian passiflora virus	Passionfruit
<i>Echinothrips americanus</i>	Poinsettia thrips	Production nurseries
<i>Eldana saccharina</i>	African sugarcane stalkborer	Sugarcane
<i>Elytroteinus subtruncatus</i>	Fijian ginger weevil	Ginger
<i>Endocronartium harknessii</i>	Western gall rust	Forestry
<i>Epichoristodes acerbella</i>	South African carnation tortrix, South African carnation miner	Cutflower
<i>Ericaphis fimbriata</i> (with blueberry scorch Carlavirus)	Blueberry aphid	Blueberry
<i>Eriota thrax</i>	Banana skipper butterfly	Banana, EPPRD
<i>Erwinia amylovora</i>	Fire blight	Apple and Pear, EPPRD
<i>Erwinia herbicola</i> (exotic strains)	Avocado blast	Avocado
<i>Erwinia herbicola</i> pv. <i>gypsophila</i>	Bacterial gall	Cutflower
<i>Erwinia papayae</i>	Bacterial crown rot	Papaya
<i>Erwinia</i> spp.	Mushy canker	Papaya
<i>Erwinia tracheiphila</i>	Cucurbit bacterial wilt	Melon
<i>Eumerus amoenus</i>	Onion bulb fly	Onion
<i>Eumerus strigatus</i>	Lesser bulb fly	Onion
<i>Eumetopina flavipes</i>	Sugarcane leafhopper (vector of Ramu stunt disease)	Sugarcane

Table 46. High priority pest threats (continued)

Scientific name	Common name	High priority pest of
<i>Candidatus Phytoplasma prunorum</i>	European stone fruit yellows	Cherry, Summerfruit, EPPRD
<i>Eurygaster integriceps</i>	Sunn pest	Grains
<i>Euschistus conspersus</i>	Conspere stink bug	Rubus
<i>Frankliniella bispinosa</i>	Florida flower thrips	Citrus
<i>Frankliniella intonsa</i>	Flower thrips	Tomato, Cutflower
<i>Frankliniella tritici</i>	Eastern flower thrips	Cutflower
<i>Fusarium circinatum</i>	Pitch canker	Forestry
<i>Fusarium mangiferae</i>	Mango malformation	Mango, EPPRD
<i>Fusarium mexicanum</i>	Mango malformation	Mango
<i>Fusarium oxysporum</i> f. sp. <i>chrysanthemi</i>	Fusarium wilt of chrysanthemum	Cutflower
<i>Fusarium oxysporum</i> f. sp. <i>ciceris</i>	Fusarium wilt of chickpea	Grains
<i>Fusarium oxysporum</i> f. sp. <i>cubense</i>	Panama disease, Tropical race 4	Banana, EPPRD
<i>Fusarium oxysporum</i> f. sp. <i>glycines</i>	Fusarium wilt of soybean	Grains
<i>Fusarium oxysporum</i> f. sp. <i>lupini</i>	Fusarium wilt of lupin	Grains
<i>Fusarium oxysporum</i> f. sp. <i>vasinfectum</i> (exotic races)	Fusarium wilt	Cotton
<i>Fusarium oxysporum</i> f.sp. <i>melonis</i> (exotic races)	Fusarium root and stem rot of melons	Melon
<i>Fusarium oxysporum</i> f.sp. <i>niveum</i> (exotic races)	Fusarium root and stem rot of melons	Melon
<i>Fusarium oxysporum</i> f.sp. <i>radicis-cucumerinum</i>	Fusarium root and stem rot of melons	Melon
<i>Fusarium proliferatum</i>	Mango malformation	Mango
<i>Fusarium</i> spp. (<i>F. ananatum</i> and <i>F. guttiforme</i> syn. <i>F. subglutinans</i> f.sp. <i>anasas</i>)	Fusariosis/ Fusarium stem rot/ pineapple eye rot/ fruitlet core rot	Pineapple
<i>Fusarium sterilihyphosum</i>	Mango malformation	Mango
<i>Fusarium virguliforme</i>	Sudden death syndrome	Grains
<i>Fusicladium effusum</i> (syn. <i>Cladosporium caryigenum</i>)	Pecan scab	Nut
<i>Globodera pallida</i> (pathotypes PA1, PA2)	Potato cyst nematode (white or pale)	Potato

Scientific name	Common name	High priority pest of
<i>Globodera rostochiensis</i> (exotic strains)	Potato cyst nematode (golden)	Potato, EPPRD
Grapevine flavescence dorée phytoplasma	Flavescence dorée	Viticulture
Grassy shoot phytoplasma	Grassy shoot	Sugarcane
<i>Groundnut bud necrosis virus</i> (Tospovirus)	Bud necrosis disease	Grains, Vegetable
<i>Groundnut ringspot virus</i> (Tospovirus)	Groundnut ringspot virus	Grains
<i>Guignardia bidwellii</i>	Black rot	Viticulture, EPPRD
<i>Guignardia musae</i>	Banana freckle	Banana, EPPRD
<i>Gymnoconia nitens</i>	Orange rust (short-cycled)	Rubus
<i>Halyomorpha halys</i>	Brown-marmorated stink bug	Apple and Pear, Truffle, Cotton, Nut, Rubus
<i>Haplothrips chinensis</i>	Chinese Thrips	Cutflower
<i>Harpophora maydis</i>	Late wilt	Grains
<i>Heilipus lauri</i>	Large seed weevil	Avocado
<i>Helicoverpa armigera</i> (carrying <i>Bt</i> resistance alleles)	Cotton bollworm	Cotton
<i>Heterocrossa rubophaga</i>	Raspberry bud moth	Rubus
<i>Heterodera carotae</i>	Carrot cyst nematode	Vegetable
<i>Heterodera ciceri</i>	Chickpea cyst nematode	Grains
<i>Heterodera filipjevi</i>	Cereal cyst nematode	Grains
<i>Heterodera glycines</i>	Soybean cyst nematode	Grains
<i>Heterodera latipons</i>	Mediterranean cereal cyst nematode	Grains
<i>Heterodera sorghi</i>	Sorghum cyst nematode	Grains
<i>Homalodisca vitripennis</i> (syn. <i>Homalodisca coagulata</i>)	Glassy winged sharpshooter	Cherry, Citrus, Production nurseries, Summerfruit, Viticulture
<i>Homoeosoma electellum</i>	Sunflower moth	Grains
<i>Hoplostoma fuligineus</i>	Large hive beetle	Honey bee
<i>Hyalesthes obsoletus</i>	Cixiidae planthopper	Viticulture
<i>Hylesia nigricans</i>	Burning moth	Forestry
<i>Hypothenemus obscurus</i>	Tropical nut borer	Nut

Table 46. High priority pest threats (continued)

Scientific name	Common name	High priority pest of
<i>Ips typographus</i>	Spruce bark beetle	Forestry
<i>Leptinotarsa decemlineata</i>	Colorado potato beetle	EPPRD
<i>Leptoglossus clypealis</i>	Leaf footed bug	Nut
<i>Leptoglossus occidentalis</i>	Western conifer seed bug	Nut
<i>Leptoglossus zonatus</i>	Western leaf footed bug	Nut
<i>Lettuce infectious yellows virus</i> (Crinivirus)	Lettuce infectious yellows virus	Production nurseries
<i>Liriomyza bryoniae</i>	Tomato leaf miner	Tomato, Melon, Vegetable
<i>Liriomyza congesta</i>	Pea leafminer	Cutflower
<i>Liriomyza huidobrensis</i>	Serpentine leaf miner	Tomato, Cutflower, Melon, Production nurseries, Vegetable
<i>Liriomyza sativae</i>	Vegetable leaf miner, American leaf miner	Tomato, Melon, Onion, Vegetable, EPPRD
<i>Liriomyza trifolii</i>	American serpentine leaf miner	Tomato, Cutflower, Melon, Vegetable
<i>Lissachatina fulica</i> (syn. <i>Achatina fulica</i>)	Giant African snail	Tomato, Production nurseries
<i>Lissorhoptus oryzophilus</i>	Rice water weevil	Rice, EPPRD
<i>Lobesia botrana</i>	European grapevine moth	Viticulture
<i>Lygus hesperus</i>	Western plant bug	Cotton, Strawberry, EPPRD
<i>Lygus lineolaris</i>	Tarnished plant bug	Cotton, Production nurseries, Strawberry
<i>Lymantria dispar</i>	Asian gypsy moth	Apple and Pear, Production nurseries, Nut, Forestry
<i>Lymantria mathura</i>	Rosy gypsy moth, pink gypsy moth	Apple and Pear
<i>Lymantria monacha</i>	Nun moth	Apple and Pear, Truffle, Forestry
<i>Magnaporthe grisea</i>	Rice blast	Grains, Rice, EPPRD
<i>Mayetiola destructor</i>	Hessian fly	Grains, EPPRD
<i>Mayetiola hordei</i>	Barley stem gall midge	Grains
<i>Monilinia fructigena</i>	Brown rot	Apple and Pear, Blueberry, Cherry, Summerfruit, EPPRD

Scientific name	Common name	High priority pest of
<i>Monilinia mali</i>	Monilinia leaf blight, blossom wilt	Apple and Pear
<i>Monilinia polystroma</i>	Asiatic brown rot	Apple and Pear, Summerfruit
<i>Monilinia vaccinii-corymbosi</i>	Mummy berry, cotton ball disease	Blueberry
<i>Monochamus</i> spp. including <i>M. alternatus</i> , <i>M. galloprovincialis</i> , <i>M. titillator</i> , <i>M. scutellatus</i>	Longhorn beetles	Forestry
<i>Monosporascus cannonballus</i>	Monosporascus root rot	Melon
<i>Mungbean yellow mosaic virus</i> (Begomovirus)	Mungbean yellow mosaic virus	Grains
<i>Mycosphaerella eumusae</i>	Eumusae leaf spot	Banana
<i>Nemorimyza maculosa</i>	Chrysanthemum leaf miner	Cutflower
<i>Neonectria ditissima</i> (syn. <i>Nectria galligena</i> and <i>Neonectria galligena</i>)	European canker	Apple and Pear, EPPRD
<i>Nysius huttoni</i>	Wheat bug	Grains
<i>Oligonychus ilicis</i>	Southern red mite	Production nurseries
<i>Oligonychus perseae</i>	Persea mite	Avocado
<i>Ophiostoma novo-ulmi</i> (syn. <i>Ceratocystis ulmi</i>)	Dutch elm disease	EPPRD
<i>Orgyia thyellina</i>	White spotted tussock moth	Forestry
<i>Pandemis cerasana</i>	Cherry brown tortrix	Cherry
<i>Pantoea stewartii</i>	Stewarts wilt of maize	Grains
<i>Paracoccus marginatus</i>	Papaya mealy bug	Papaya
<i>Paradasynus longirostris</i>	Hong Kong stink bug	Lychee
<i>Parasa lepida</i>	Blue striped nettle grub	Mango
<i>Passiflora chlorosis virus</i> (Potyvirus)	Passiflora chlorosis virus	Passionfruit
<i>Passionfruit crinkle virus</i> (Potyvirus)	Passionfruit crinkle virus	Passionfruit
<i>Passionfruit ringspot virus</i> (Potyvirus)	Passionfruit ringspot virus	Passionfruit
<i>Passionfruit severe leaf distortion virus</i> (Begomovirus)	Passionfruit severe leaf distortion virus	Passionfruit

Table 46. High priority pest threats (continued)

Scientific name	Common name	High priority pest of
<i>Passionfruit Sri Lankan mottle virus</i> (Potyvirus)	Passionfruit Sri Lankan mottle potyvirus	Passionfruit
<i>Passionfruit vein clearing virus</i> (Rhabdovirus)	Passionfruit vein clearing rhabdovirus	Passionfruit
<i>Passionfruit yellow mosaic virus</i> (Tymovirus)	Passionfruit yellow mosaic virus	Passionfruit
<i>Peach rosette mosaic virus</i> (Nepovirus)	Peach rosette mosaic virus	Summerfruit
<i>Peanut clump virus</i> (Pecluvirus)	Peanut clump virus	Grains
<i>Pennisetia hylaeiformis</i>	Raspberry crown borer	Rubus
<i>Pennisetia marginata</i>	Raspberry crown borer	Rubus
<i>Peridroma saucia</i>	Variegated cutworm	EPPRD
<i>Perkinsiella vastatrix</i>	Sugarcane plant hopper	Sugarcane
<i>Perkinsiella vitiensis</i>	Sugarcane plant hopper	Sugarcane
<i>Peronophythora litchii</i>	Brown blight	Lychee
<i>Peronosclerospora philippinensis</i>	Philippine downy mildew of maize	Grains, Sugarcane
<i>Peronosclerospora sacchari</i>	Sugarcane downy mildew	Sugarcane, EPPRD
<i>Peronosclerospora sorghi</i>	Downy mildew of sorghum	Grains
<i>Phakopsora euvitis</i>	Grapevine leaf rust	EPPRD
<i>Phialophora cinerescens</i>	Phialophora wilt	Cutflower
<i>Phoma tracheiphila</i>	Mal secco	EPPRD
<i>Phymatotrichopsis omnivora</i> (syn. <i>Phymatotrichum omnivorum</i> , <i>Ozonium texanum</i>)	Texas root rot	Cherry, Cotton, EPPRD
<i>Phytophthora gymnostoma</i>	Allium leaf miner	Onion
<i>Phytophthora fragariae</i> var. <i>fragariae</i>	Red steele root rot	Strawberry, EPPRD
<i>Phytophthora infestans</i> (A2 mating type and exotic strains of A1 mating type)	Late blight	Potato
<i>Phytophthora kernoviae</i>	Phytophthora blight	Avocado
<i>Phytophthora menzei</i>	Trunk canker	Avocado
<i>Phytophthora pinifolia</i>	Dano foliar del Pino	Forestry

Scientific name	Common name	High priority pest of
<i>Phytophthora ramorum</i>	Sudden oak death	Avocado, Truffle, Blueberry, Cutflower, Production nurseries, Nut, Forestry, EPPRD
<i>Planococcus ficus</i>	Vine mealybug	Viticulture
<i>Planotortrix octo</i>	Green headed leaf roller	Cherry
<i>Plasmopara halstedii</i>	Downy mildew of sunflower	Grains
<i>Plum pox virus</i> (Potyvirus)	Plum pox virus	Cherry, Summerfruit, EPPRD
<i>Podosphaera clandestina</i> var. <i>clandestina</i> (exotic strains)	Powdery mildew of cherry	Cherry
<i>Polychrosis viteana</i>	American berry moth	Viticulture
<i>Polyocha depressella</i>	Root borer	Sugarcane
<i>Pomacea canaliculata</i>	Golden apple snail	Production nurseries, Rice, EPPRD
<i>Popillia japonica</i>	Japanese beetle	Rubus, Summerfruit
<i>Potato spindle tuber viroid</i> (Pospiviroidae)	Potato spindle tuber viroid	Potato, EPPRD
<i>Potato virus Y</i> (Potyvirus) (exotic strains)	Potato virus Y	Potato
<i>Prays oleae</i>	Olive moth	Olive
<i>Procontarinia</i> spp. (exotic species)	Mango gall midges	Mango
<i>Prostephanus truncatus</i>	Larger grain borer	Grains
<i>Pseudocercospora fijiensis</i> (syn. <i>Mycosphaerella fijiensis</i>)	Black sigatoka	Banana, EPPRD
<i>Pseudococcus maritimus</i>	Grape mealybug	Viticulture
<i>Pseudomonas avellanae</i> (syn. <i>P. syringae</i> pv. <i>avellanae</i>)	Bacterial canker	Truffle
<i>Pseudomonas syringae</i> pv. <i>syringae</i> (exotic races)	Bacterial canker	Avocado, Production nurseries
<i>Pseudotheraptus wayi</i>	Coconut bug	Lychee
<i>Psila rosae</i>	Carrot rust fly	Vegetable
<i>Puccinia asparagi</i>	Asparagus rust	EPPRD
<i>Puccinia graminis</i> f. sp. <i>tritici</i> (exotic pathogenic races e.g. Ug99)	Stem rust of wheat	Grains

Table 46. High priority pest threats (continued)

Scientific name	Common name	High priority pest of
<i>Puccinia psidii</i> sensu lato (exotic variants)	Guava rust/Eucalyptus rust	Cutflower, Production nurseries, Forestry, EPPRD
<i>Puccinia</i> spp. (exotic species affecting <i>Allium</i> spp.)	Rust	Onion
<i>Puccinia striiformis</i> f. sp. <i>hordei</i>	Barley stripe rust	Grains
<i>Pucciniastrum coryli</i>	Hazelnut rust	Truffle
<i>Pyrilla perpusilla</i>	Sugarcane pyrilla	Sugarcane
<i>Radopholus similis</i> (exotic strains)	Burrowing nematode	Ginger
<i>Raffaelea lauricola</i>	Laurel wilt	Avocado
<i>Ralstonia solanacearum</i> , race 2	Moko	Banana, EPPRD
<i>Ralstonia solanacearum</i> , race 3 (exotic strains)	Bacterial wilt	Potato
<i>Ralstonia solanacearum</i> , race 4 (exotic strains) (syn. <i>Pseudomonas solanacearum</i>)	Bacterial wilt	Ginger
Raspberry ringspot virus (Nepovirus)	Raspberry ringspot virus	Rubus, Strawberry
<i>Rhagoletis fausta</i>	Black cherry fruit fly	Cherry
<i>Rhagoletis indifferens</i>	Western cherry fruit fly	Cherry
<i>Rhagoletis pomonella</i>	Apple maggot	Apple and Pear, Cherry
<i>Rhizoctonia solani</i> f. sp. <i>sasaki</i> (AG 1)	Banded leaf and sheath spot	Grains
<i>Rhizoglyphus callae</i>	Bulb mite	Onion
<i>Rhizoglyphus setosus</i>	Bulb mite	Cutflower, Onion
<i>Rhodococcus fascians</i>	Leafy gall	Cutflower
Rice grassy stunt virus (Tenuivirus)	Rice grassy stunt virus	Rice
Rice ragged stunt virus (Oryzavirus)	Ragged stunt virus	Rice
Rice tungro bacilliform virus (unassigned)	Rice tungro bacilliform virus	Rice
Rice tungro spherical virus (Waikavirus)	Rice tungro spherical virus, Waika virus	Rice
<i>Riptortus dentipes</i>	Pod sucking bug	Grains
<i>Roesleria subterranea</i>	Grape root rot	EPPRD
<i>Schizaphis graminum</i>	Greenbug	Grains

Scientific name	Common name	High priority pest of
<i>Scirpophaga excerptalis</i>	Top shoot borer	Sugarcane
<i>Scirtothrips perseae</i>	Avocado thrips	Avocado
<i>Sesamia griseascens</i>	Stem borer	Sugarcane, EPPRD
Slow paralysis virus (Iflavivirus)	Slow paralysis virus	Honey bee
Soil-borne wheat mosaic virus (Furovirus)	Soil-borne wheat mosaic virus	Grains
<i>Sphaceloma perseae</i>	Avocado scab	Avocado
<i>Spiroplasma citri</i>	Stubborn	Citrus
<i>Spodoptera eridania</i>	Southern armyworm	Cutflower
<i>Spodoptera frugiperda</i>	Fall armyworm	Cutflower
<i>Spodoptera littoralis</i>	Cotton leafworm	Cutflower
<i>Stagonospora sacchari</i>	Leaf scorch	Sugarcane, EPPRD
<i>Stenoma catenifer</i>	Avocado seed moth	Avocado
<i>Sternochetus frigidus</i>	Mango pulp weevil	Mango, EPPRD
Strawberry latent ringspot virus (Sadwavirus)	Strawberry latent ringspot virus	Rubus, Strawberry
<i>Strymon megarus</i> (as a vector of <i>Fusariosis</i>)	Pineapple fruit borer	Pineapple
Sugarcane streak mosaic virus (Poacevirus)	Sugarcane streak mosaic	Sugarcane, EPPRD
<i>Teratosphaeria gauchensis</i>	Coniothyrium Eucalyptus canker	Forestry
<i>Teratosphaeria zuluensis</i>	Coniothyrium Eucalyptus canker	Forestry
<i>Tetranychus piercei</i>	Banana spider mite	Banana, EPPRD
<i>Thaumatotibia leucotreta</i> syn. <i>Cryptophlebia leucotreta</i>	False codling moth	Cotton, Grains, Pineapple, Summerfruit, EPPRD
<i>Thrips tabaci</i> (exotic strains and biotypes)	Onion thrips	Onion
<i>Tilletia barclayana</i>	Kernel smut of rice	EPPRD
<i>Tilletia indica</i>	Karnal bunt	Grains, EPPRD
Tomato black ring virus (Nepovirus)	Tomato black ring virus	Strawberry
Tomato ringspot virus (Nepovirus)	Tomato ringspot virus	Rubus, Strawberry
<i>Tomicus piniperda</i>	Pine shoot beetle	Forestry

Table 46. High priority pest threats (continued)

Scientific name	Common name	High priority pest of
<i>Toxotrypana curvicauda</i>	Papaya fly	Papaya
<i>Tribolium castaneum</i> (phosphine resistant)	Rust red flour beetle	EPPRD
<i>Trioza erytreae</i>	African citrus psyllid	Citrus
<i>Trogoderma granarium</i>	Khapra beetle	Grains, Nut, Rice, EPPRD
<i>Tropilaelaps clareae</i>	Tropilaelaps mite	Apple and Pear, Honey bee, Nut
<i>Tropilaelaps mercedesae</i>	Tropilaelaps mite	Apple and Pear, Honey bee, Nut
<i>Tuta absoluta</i>	South American tomato moth, tomato leafminer	Tomato
Unknown	Ramu stunt disease	Sugarcane, EPPRD
Unknown (suspected phytoplasma)	Longan and lychee witches' broom disease	Lychee
<i>Uredo rangelii</i>	Myrtle rust	EPPRD
<i>Urocerus gigas</i>	Giant wood wasp	Forestry
<i>Varroa destructor</i>	Varroa mite	Apple and Pear, Honey bee, Nut
<i>Varroa jacobsoni</i>	Varroa mite	Honey bee
<i>Verticillium dahliae</i> (defoliating strain)	Verticillium wilt	Cotton, Nut, Olive, EPPRD
<i>Vespa</i> spp. (exotic species)	Hornets	Honey bee
<i>Watermelon bud necrosis virus</i> (Tospovirus)	Watermelon bud necrosis	Vegetable
<i>Watermelon silver mottle virus</i> (Tospovirus)	Watermelon silver mottle	Vegetable
<i>Wheat spindle streak mosaic virus</i> (Bymovirus)	Wheat spindle streak mosaic virus	EPPRD
<i>White leaf phytoplasma</i>	White leaf	Sugarcane, EPPRD
<i>Xanthomonas albilineans</i> (exotic strains- serological groups 2 or 3)	Leaf scald	Sugarcane
<i>Xanthomonas axonopodis</i> pv. <i>allii</i>	Xanthomonas leaf blight	Onion
<i>Xanthomonas axonopodis</i> pv. <i>passiflorae</i>	Bacterial blight	Passionfruit
<i>Xanthomonas campestris</i> (avocado strain)	Bacterial canker	Avocado

Scientific name	Common name	High priority pest of
<i>Xanthomonas citri</i> subsp. <i>citri</i> (syn. <i>X. axonopodis</i> pv. <i>citri</i>)	Citrus canker	Citrus, EPPRD
<i>Xanthomonas citri</i> subsp. <i>malvacearum</i> (syn. <i>X. axonopodis</i> pv. <i>malvacearum</i>)	Bacterial blight, angular leaf spot	Cotton, EPPRD
<i>Xanthomonas fragariae</i>	Strawberry angular leaf spot	Strawberry, EPPRD
<i>Xylella fastidiosa</i> (subspecies not specified)	Pierce's disease, blueberry leaf scorch, olive leaf scorch, olive quick decline, phony peach	Blueberry, Cherry, Citrus, Production nurseries, Nut, Summerfruit, Viticulture, EPPRD
<i>Xylella fastidiosa</i> subsp. <i>fastidiosa</i>	Pierce's disease, blueberry leaf scorch, olive leaf scorch	Olive, EPPRD
<i>Xylella fastidiosa</i> subsp. <i>pauca</i>	Pierce's disease, blueberry leaf scorch, olive quick decline	Olive, EPPRD
<i>Xylosandrus compactus</i>	Black twig borer	Mango
<i>Zea mosaic virus</i> (Potyvirus)	Zea mosaic virus	Grains
<i>Zeugodacus cucurbitae</i> (syn. <i>Bactrocera cucurbitae</i>)	Melon fruit fly	Avocado, Tomato, Melon, Papaya, Passionfruit, Summerfruit, Vegetable



Leaf symptoms of Pierce's disease. Image courtesy of Christine Horlock, Department of Agriculture and Fisheries Queensland



An adult female Varroa mite feeds on a developing bee. Image courtesy of Scott Bauer, USDA Agricultural Research Service, Bugwood.org