



# Chapter 7

Controlling plant pests and weeds



Image courtesy of AUSVEG

## Controlling plant pests and weeds

While many resources are invested in keeping new pests out of Australia and responding to pest detections, existing pests and weeds require biosecurity measures to prevent further spread.

This chapter describes biosecurity measures that apply to established pests and weeds found in certain parts of Australia that must be managed.

There is a national system that coordinates domestic quarantine restrictions to prevent pest spread within Australia, but post-border control of pests and weeds is one part of the biosecurity system where agricultural industries and the Australian community have a major role to play.

Farmers are aware that they have responsibility for controlling pests and weeds on their property and the use of on-farm biosecurity practices is on the rise. However, there is more that producers can do to prevent biosecurity incursions on their properties. This chapter details the communication initiatives undertaken by Plant Health Australia (PHA), governments and industries to encourage on-farm biosecurity risk mitigation.

The chapter finishes with an overview of Australia's weed biosecurity system.

## Domestic quarantine

Plant pests can be spread easily from one part of Australia to another through the movement of plants, plant products, people, soil and equipment. The main concerns are newly established and regionalised pests.

To address this risk, domestic quarantine restrictions imposed on the movement of high-risk items apply in each state and territory. Restrictions operate under state and territory legislation to complement and support the national quarantine legislation that governs the import and export of goods to and from Australia.

### SUBCOMMITTEE ON DOMESTIC QUARANTINE AND MARKET ACCESS

The coordination of domestic quarantine between the state and territory governments is assisted by the Subcommittee on Domestic Quarantine and Market Access (SDQMA).

This committee consists of senior plant health regulators from state and territory governments, representatives from the Australian Government Department of Agriculture, Water and the Environment (DAWE) and an independent chair from PHA.

The objective of the committee is to develop, review and maintain domestic quarantine standards and conditions that allow movement of produce around the country while avoiding the spread of regionalised plant pests. For example, produce from fruit fly affected regions can be moved to non-affected regions for sale, once it has met certain conditions such as in-field and post-harvest treatments.

The SDQMA is tasked with ensuring that conditions are:

- technically justified and least trade restrictive, to minimise regulatory burdens on industry
- coordinated and harmonised across the country and regions to the extent possible
- consistent with Australia's international obligations under the World Trade Organization's Agreement of the Application of Sanitary and Phytosanitary Measures.

SDQMA works closely with state and national plant quarantine agencies and industries to develop and implement new treatment arrangements, as well as adopting international treatment practices, which not only provide for domestic trade, but also present a potential pathway to support international market access.

## RESTRICTIONS ON INTERSTATE TRAVELLERS CARRYING PRODUCE

Anyone travelling within Australia, moving house across regional or state borders, or moving produce around the country is bound by restrictions on what they can and cannot carry, set by state and territory legislation. Rules apply to high-risk material including plants and plant products, fruit and vegetables, honey and beekeeping equipment, soil, agricultural machinery and recreational equipment.

The Australian Interstate Quarantine website [interstatequarantine.org.au](http://interstatequarantine.org.au) provides information on domestic quarantine restrictions for travellers and producers. This information is also available in a downloadable booklet, Australian Interstate Quarantine: A Traveller's Guide.

There are quarantine bins at some high-risk domestic airports, ferry terminals, and state or quarantine zone borders. Travellers must dispose of any restricted products at those points. Rules change as new pest incursions occur, so travellers are advised to check on the Australian Interstate Quarantine website for the latest information.



Travellers must surrender fruit and vegetables in amnesty quarantine bins located at airports, seaports and checking stations.

## Restrictions on interstate movement of commercial consignments

Commercial trade in products being moved around Australia is managed by the states and territories, who regulate the provision of certificates attesting that the goods meet the receiving state or territory's entry conditions. Consignments of produce that originate from a controlled region can be shipped into a region that does not have the pest of concern, if the produce is certified to have been treated in such a way that it no longer poses a biosecurity risk. It might be growing or packing produce in a particular way, such as under cover, or being treated after harvest.

Four types of certificates are issued by the exporting state or territory to certify that produce for interstate trade meets the receiver's requirements:

**Plant Health Certificate** – issued by a government officer from the state or territory of origin.

**Plant Health Assurance Certificate** – supplied by an approved business under an Interstate Certification Assurance (ICA) scheme. To issue these certificates a business must meet specific requirements and undergo regular audits by the state or territory government accreditation authority.

**BioSecure HACCP Biosecurity Certificate** – issued through a third party. In 2018, Nursery and Garden Industry Australia (now Greenlife Industry Australia) received approval to issue the first certificates of this type.

**Area Freedom Certificate** – issued by a government officer when an area is known to be free of a particular pest.

The Australian Interstate Quarantine website lists all ICAs by state or territory and holds the Schedule of National Interstate Certification Assurance Documents, a complete list of ICAs. The site also refers users to BioSecure HACCP Biosecurity Certificates, where they exist.



## OFFICIAL CONTROL OF QUARANTINE PLANT PESTS TO PROTECT OVERSEAS TRADE

Since 2017, the Plant Quarantine Pest and Official Control National Policy – implemented by the Chief Plant Health Managers across Australia – has helped to contain and control new plant pests and diseases, while allowing the Australian Government to continue to regulate imports to prevent pest entry at the international border. The policy also facilitates exports, so growers can continue sending their products to overseas markets.

On occasions, an exotic plant pest or disease may enter Australia that cannot be eradicated. In these circumstances, responsibility for managing the pest or disease rests with industry and the government of the state or territory in which it occurs.

When 'official control' is applied, the state or territory government has put in place measures that aim to contain and control the pest or disease. These mandatory activities include:

- containment or suppression activities (mostly involving destruction, disposal and decontamination)
- surveillance in the area where the pest or disease could establish
- movement restrictions so the pest or disease does not spread to an area that is not affected.

Official control can be applied at a regional or national level. If it is applied nationally, it must be consistent across all states and territories.

When an exotic pest or disease enters and is officially confirmed to be in Australia, DAWE has an obligation to notify the International Plant Protection Convention. When other countries become aware of the presence of the pest or disease in Australia, it can trigger trade bans or restrictions on our exports, as well as requests for Australia to review its current import conditions.

If Australia can provide trading partners with evidence that the pest or disease is under official control, the department can continue to justify regulating international imports to prevent exotic pest entry.

Official control may also underpin negotiations for export with concerned trading partners to accept plants or products that have been produced in areas of Australia that are not affected by the pest or disease, or are treated to importing country standards to manage the biosecurity risk. If an established pest is not under official control, the department cannot justify continuing to prevent the pest's entry by regulating imported goods and conveyances for that pest.

While there are numerous benefits in implementing official control, there are also costs associated with containment, surveillance and movement restrictions. State and territory governments, in consultation with peak industry bodies, must determine whether official control is cost-beneficial or whether other management options are more appropriate for the plant pest.

## AUSTRALIA'S REGIONALISED PESTS

When new exotic pests with the potential to cause serious economic impact on plant production industries are detected, eradication is the ideal goal. Australia has had great success in eradicating exotic pests, but there are instances where this is not possible.

Following the establishment of these pests, measures can still be taken to minimise impacts, primarily through containment. Regionalised pests can be contained at a local, regional or state level, depending on current distribution and the ability to implement cost beneficial measures for containment.

Legislation at the jurisdictional level supports the ability to contain pests. The legislation is supported by jurisdictional operations in cooperation with the other jurisdictions and relevant industries.

The regionalised pests listed in Table 57 (page 200) are those formally recognised and backed by legislation: it is not an exhaustive list of all pests found in Australia in 2020.



Resident receiving information about Queensland fruit fly during a response. Image courtesy of WA DPIRD

## PREVENTING THE SPREAD OF FRUIT FLIES

Australia is fortunate to be free of some of the most damaging fruit fly species that occur overseas. Some of these – like the Oriental fruit fly, Natal fruit fly, melon fly and peach fruit fly – would cause considerable damage to crop production in Australia should they establish here. To ensure we remain free of these devastating pests, Australia has an extensive system of surveillance and an ongoing eradication response in the Torres Strait.

Two fruit fly species in Australia are significant pests economically – Queensland fruit fly and the Mediterranean fruit fly. They are the focus of pest management programs and quarantine restrictions to prevent Queensland fruit fly from spreading into TAS, WA and SA, and Mediterranean fruit fly spreading from WA.

Given the widespread ramifications of fruit flies, it's in everyone's interest to prevent exotic fruit flies from reaching or becoming established in Australia and to tackle fruit fly management collectively.

The National Fruit Fly Council (NFFC) helps drive the delivery of a national system that prevents fruit flies being a constraint to sustainable production or a barrier to trade and market access.

The NFFC includes representatives from governments, horticulture industries and Hort Innovation. It has an independent chair and is supported by a manager and a secretariat from PHA. It focuses on four areas:

- maintaining Australia's freedom from exotic fruit fly
- minimising the incidence and spread of fruit fly
- ensuring national systems support market access
- adopting a cooperative approach to fruit fly management.

The NFFC oversees and monitors implementation of the National Fruit Fly Strategy.

In 2020, the NFFC worked with key stakeholders to review progress on the strategy and to update it to better reflect current and emerging national fruit fly management issues. The 2020–25 National Fruit Fly Strategy and associated 2020–21 Implementation Plan were launched in November 2020.

Regular meetings provide an important opportunity to identify priority areas for action and to promote coordination of activities between members. A particular focus in 2020 has been to improve engagement with stakeholders through an increased communication presence. This has brought the NFFC a better understanding of current fruit fly challenges across Australia and provided opportunities to increase the general awareness of fruit fly as important pests, how they can be managed, and promotion of a nationally coordinated system.

The website [preventfruitfly.com.au](http://preventfruitfly.com.au) provides information for backyard growers and commercial producers. It is supported by an e-newsletter and Twitter to keep stakeholders informed.

## 2020–25 National Fruit Fly Strategy released

The 2020-25 National Fruit Fly Strategy was released in November 2020 at a meeting of the National Fruit Fly Council (NFFC). The strategy provides a framework for governments, industries and research funders to advance fruit fly management in Australia and prevent exotic species from establishing.

The strategy focuses on maintaining and improving access to domestic and international markets for affected industries, which make up about half of Australia's \$13 billion horticulture sector.

The strategy builds on the 2008 version and is the result of a collaborative effort by Australia's horticultural industries, state governments, the Australian Government, Hort Innovation and various research institutions. It reflects their contributions and maps the actions required to meet the needs of affected parties.

These needs have been captured under eight interdependent priority areas: market access; management of established fruit fly; prevention, preparedness and response; research; surveillance; diagnostics; communication and engagement; and cooperation.

The NFFC is tasked with overseeing the implementation of the strategy under the 2020–21 Implementation Plan to identify and monitor key activities under the strategy.

More information is available from the Prevent Fruit Fly website [preventfruitfly.com.au](http://preventfruitfly.com.au)

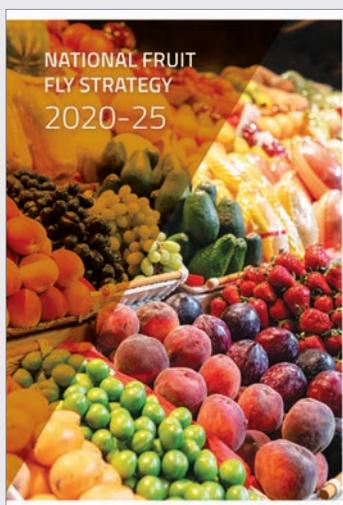


Table 57. Australia's regionalised pests

Scientific name	Common name	Area of regionalisation
<b>New South Wales</b>		
<i>Bactrocera tryoni</i>	Queensland fruit fly	Endemic within all of NSW excluding the Queensland Fruit Fly Control Zone on the Victorian border as defined in Biosecurity (Queensland Fruit Fly) Control Order 2017
<i>Banana bunchy top virus</i> (Babuvirus)	Banana bunchy top virus	Present within the Banana Bunchy Top Virus Control Zone on the far north coast as defined in the Biosecurity (Banana Bunchy Top Virus) Control Order 2017
<i>Daktulosphaira vitifoliae</i>	Grapevine phylloxera	Present within the Grapevine Phylloxera Infested Areas, comprising the Sydney and the Albury-Corowa regions as defined in the Biosecurity Regulation 2017
<i>Panonychus citri</i>	Citrus red mite	Present within the Citrus Red Mite Biosecurity Zone, comprising the Cumberland and Northumberland counties as defined in the Biosecurity Regulation 2017
<i>Ralstonia solanacearum</i>	Bacterial wilt of potatoes	Present in NSW excluding the Seed Protected Area, comprising specific areas within the Central Tablelands and Northern Tablelands as defined in the Biosecurity Regulation 2017 under the <i>Biosecurity Act 2015</i>
<i>Spongospora subterranea</i>	Powdery scab of potatoes	Present in NSW excluding the Seed Protected Area, comprising specific areas within the Central Tablelands and Northern Tablelands as defined in the Biosecurity Regulation 2017
<b>Northern Territory</b>		
<i>Aleurodicus dispersus</i>	Spiraling whitefly	Darwin, Palmerston, Darwin rural area, Katherine
<i>Bactrocera tryoni</i>	Queensland fruit fly	Darwin, Palmerston, Darwin rural area, Katherine, Tennant Creek, Alice Springs
<i>Cosmopolites sordidus</i>	Banana weevil borer	Darwin rural area
<i>Cucumber green mottle mosaic virus</i>	CGMMV	Darwin, Darwin rural area, Katherine, Ti Tree
<i>Fusarium oxysporum</i> f.sp. <i>cubense</i> tropical race 4	Panama disease	Darwin, greater Darwin, Nhulunbuy
<i>Thrips palmi</i>	Melon thrips	Darwin rural area

Table 57. Australia's regionalised pests (continued)

Scientific name	Common name	Area of regionalisation
<b>Queensland</b>		
<i>Anoplolepis gracilipes</i>	Yellow crazy ant	Populations dotted in various locations from Cairns to the Gold Coast
<i>Apis cerana</i> , Java genotype	Asian honey bee	Surrounding Cairns region, north to Twyford (near Mossman), west of Dimbula and south to Feluga. A genetically distinct population of AHB is the focus of a <i>Varroa jacobsoni</i> (Varroa mite) eradication in Townsville.
<i>Banana bunchy top virus</i> (Babuvirus)	Bunchy top	Noosa, south to the NSW border
<i>Chilo terrellus</i> (Pagenstecher)	Sugarcane stem borer	Detected on a number of occasions in sugarcane on two of the three Torres Strait islands close to Papua New Guinea (Saibai and Dauan)
<i>Cucumber green mottle mosaic virus</i>	Cucumber green mottle mosaic virus	Confined to three quarantined businesses; one in north QLD and two in the Wide Bay region
<i>Cryptotermes brevis</i>	West Indian drywood termite	Greater Brisbane, Wide Bay–Burnett, Rockhampton, Bowen, Townsville
<i>Deanolis sublimbalis</i>	Red banded mango caterpillar	Islands in the Torres Strait as well as Cape York Peninsula north of the Jardine River
<i>Eumetopina flavipes</i> (Muir)	Island sugarcane planthopper	Torres Strait island archipelago and the northern peninsula area of Cape York
<i>Fiji disease virus</i>	Fiji disease virus	Sugarcane biosecurity zones 4, 5 and 6
<i>Fusarium odoratissimum</i> (syn: <i>Fusarium oxysporum</i> f. sp. <i>cubense</i> ) (Panama disease tropical race 4)	Panama disease tropical race 4	Detected in 2015, 2017, 2018 and 2020 on five separate commercial banana growing properties in the Tully Valley. A containment program remains in place.
<i>Liriomyza sativae</i>	Vegetable leafminer	Some islands in Torres Strait and at Seisia in the northern peninsula area of Cape York
<i>Mycosphaerella fijiensis</i>	Black Sigatoka	Some northern and eastern Torres Strait Islands
<i>Papaya ringspot virus</i> (Potyvirus)	Papaya ringspot virus	South-east QLD, as far north as Bundaberg area
<i>Planococcus lilacinus</i>	Coffee mealybug	Boigu Island, Torres Strait islands
<i>Procontarinia pustulata</i>	Mango leaf gall midge	Torres Strait and northern tip of Cape York Peninsula
<i>Pseudococcus jackbeardsleyi</i>	Jack Beardsley mealybug	Torres Strait islands and the Cape York Peninsula

Table 57. Australia's regionalised pests (continued)

Scientific name	Common name	Area of regionalisation
<b>Queensland (continued)</b>		
<i>Pseudocercospora purpurea</i>	Cercospora leaf spot	Mareeba Shire Council and Tablelands Regional Council
<i>Sugarcane mosaic virus</i> (strain A) (Potyvirus)	Sugarcane mosaic virus	Sugarcane biosecurity zones 4, 5 and 6
<i>Sugarcane striate mosaic-associated virus</i> (Carlavirus)	Sugarcane striate mosaic virus	Sugarcane biosecurity zone 2 and 6
<i>Tetranychus piercei</i>	Spider mite	Weipa, Cape York Peninsula
<i>Wasmannia auropunctata</i>	Electric ant	Far north QLD, Cairns hinterland, Bingle Bay
<b>South Australia</b>		
<i>Caracollina lenticula</i>	Lens snail	Known to be present on four properties at Largs North
<i>Cucumber green mottle mosaic virus</i>	Cucumber green mottle mosaic virus	Known to be present on six properties on the Northern Adelaide Plains
<i>Melissococcus pluton</i>	European foulbrood	Endemic across most of SA but not known to occur on Kangaroo Island
<i>Nosema ceranae</i>	Nosema	Endemic across most of SA but not known to occur on Kangaroo Island
<i>Paenibacillus larvae</i>	American foulbrood	Endemic across most of SA, under eradication following detection in honey sample from Kangaroo Island
<b>Victoria</b>		
<i>Bemisia tabaci</i>	Silverleaf whitefly	Murchison, Shepparton and Gillieston
<i>Cantareus apertus</i>	Green snail	Cobram
<i>Daktulosphaira vitifoliae</i>	Phylloxera	Six Phylloxera Infested Zones: Maroondah, Mooroopna, Nagambie, north-east VIC, Upton and Whitebridge
<i>Globodera rostochiensis</i>	Potato cyst nematode	Koo Wee Rup, Thorpdale, Gembrook, Wandin North and Mornington

Table 57. Australia's regionalised pests (continued)

Scientific name	Common name	Area of regionalisation
Western Australia		
<i>Achroia grisella</i>	Lesser wax moth	WA. Regulations or controls for movement and control in specified areas
<i>Aethina tumida</i>	Small hive beetle	Kimberley. Host material restricted from movement to rest of state
<i>Bemisia tabaci</i> (Gennadius, 1889) B biotype	Silverleaf whitefly	Perth and Carnarvon. Host material restricted from movement to Kununurra
<i>Brontispa longissima</i>	Palm leaf beetle	Broome. Host material restricted from movement to rest of state
<i>Ceratitis capitata</i>	Mediterranean fruit fly	WA. Regulations or controls for movement and control in specified areas
<i>Chortoicetes terminifera</i>	Australian plague locust	WA. Absent from east Kimberley region. Regulations or controls for movement and control in specified areas
<i>Cornu apertus</i>	Green snail	WA. Regulations for control in specified areas
<i>Cosmopolites sordidus</i>	Banana weevil borer	Kununurra. Host material restricted from movement to rest of state
<i>Cryptolestes ferrugineus</i>	Flat grain beetle	WA. Regulations or controls for movement and control in specified areas
<i>Cryptolestes pusillus</i>	Flat grain beetle	WA. Regulations or controls for movement and control in specified areas
<i>Ephestia elutella</i>	Tobacco moth	WA. Regulations or controls for insecticide resistant strains
<i>Ephestia kuehniella</i>	Mediterranean flour moth	WA. Regulations or controls for insecticide resistant strains
<i>Galleria mellonella</i>	Larger wax moth	WA. Regulations or controls for movement and control in specified areas
<i>Hylotrupes bajulus</i>	European house borer	WA. Regulations or controls for movement and control in specified areas
<i>Oryzaephilus surinamensis</i>	Sawtoothed grain beetle	WA. Regulations or controls for insecticide resistant strains

Table 57. Australia's regionalised pests (continued)

Scientific name	Common name	Area of regionalisation
Western Australia (continued)		
<i>Pentalonia nigronervosa</i>	Banana aphid	Carnarvon. Host material restricted from movement to rest of the state
<i>Plodia interpunctella</i>	Indian meal moth	WA. Regulations or controls for insecticide resistant strains
<i>Rhyzopertha dominica</i>	Lesser grain borer	WA. Regulations or controls for insecticide resistant strains
<i>Sitophilus granarius</i>	Granary weevil	WA. Regulations or controls for insecticide resistant strains
<i>Sitophilus oryzae</i>	Rice weevil	WA. Regulations or controls for insecticide resistant strains
<i>Sitotroga cerealella</i>	Angoumois grain moth, grain moth	WA. Regulations or controls for insecticide resistant strains
<i>Thrips palmi</i>	Melon thrips	Kimberley (area of low pest prevalence)
<i>Tribolium castaneum</i>	Rust-red flour beetle	WA. Regulations or controls for insecticide resistant strains
<i>Tribolium confusum</i>	Confused flour beetle	WA. Regulations or controls for insecticide resistant strains
<i>Trogoderma variabile</i>	Warehouse beetle	

\*The regionalised pests listed are those formally recognised and backed by legislation in jurisdictions, and is not an exhaustive list of all pests found in Australia in 2020



*Image courtesy of AUSVEG*

## Community involvement in domestic quarantine

### THE BIOSECURITY OBLIGATIONS OF ALL AUSTRALIANS

Abiding by international and domestic border restrictions is one role that all Australians must play in maintaining Australia's biosecurity status. In addition, everyone has an obligation to avoid spreading plant pests and weeds, including keeping a lookout for anything unusual and reporting unfamiliar pests.

The introduction of a general biosecurity obligation or duty makes explicit the role that all Australians have to play in the biosecurity system. A biosecurity risk exists when dealing with any pest, disease or contaminant. This includes moving an animal, plant, turf, soil, machinery or equipment that could carry a pest, disease or contaminant.

People in QLD, NSW and TAS are now required by law to take all reasonable and practical steps to prevent or minimise the risk of causing a biosecurity 'event' and limit the consequences of such an event. A biosecurity event is caused by a pest, disease or contaminant that is, or is likely to become, a significant problem for human health, social amenity, the economy or the environment.

Australians are not expected to know about all biosecurity risks, but are expected to know about those associated with their day-to-day work and hobbies. For example:

- Those who live or work in a biosecurity zone (for example a builder or developer in a fire ant biosecurity zone) are expected to know what can and cannot move in to and out of the zone, and any other precautions required.
- Residential gardeners are expected to know the basics about reducing the risks of spreading a pest or disease, and the problem pests in their local area. They are not expected to know about all of the biosecurity risks to plants.
- Farmers are expected to stay informed about and appropriately manage the pests and diseases that could affect or be carried by their crops and livestock, as well as weeds and pest animals that could be on their property.
- Land owners are expected to stay informed about and appropriately manage the weeds and pest animals (such as wild dogs) that could be on their property.
- Transporters of agricultural produce are expected to check whether the transportation of goods could spread diseases or pests and, if so, to manage the risks appropriately.

### THE ROLE OF LOCAL GOVERNMENT

As the community's closest tier of government, local government is a key stakeholder in biosecurity management. Local government's involvement in biosecurity varies from state to state and even from region to region, but generally includes:

- managing pest species on land owned by local governments
- on-going support for local community groups in the area of natural resource management including the management of post-border invasive species
- developing and enforcing pest management local laws under the *Local Government Act 1995*
- providing tools, management plans, staff support and training on post-border biosecurity issues
- delivering environmental education programs and other information relating to biosecurity in the community
- regional collaboration between local governments to deal with regional biosecurity issues
- providing field trial sites for biological control of certain weeds.



*Australians are expected to abide by a general biosecurity duty or obligation and be aware of the risks posed by their activities, like bushwalking.*

## On-farm biosecurity

On-farm biosecurity is a set of measures producers can use to protect a property from the entry and spread of pests, diseases and weeds. Measures used on farm establish another layer of protection, allowing producers to minimise pest problems as well as boosting biosecurity for their region, their industry and supporting market access for produce.

On-farm biosecurity measures are most effective when integrated into everyday activities. Often measures are procedural, such as changing vehicles between zones on a property, providing footwear for visits to production areas, disinfecting pruning shears and ensuring that farm inputs are clean and disease free. These measures and information about the pests of their crop are included in biosecurity manuals (page 208).

More and more growers are appreciating the benefits of on-farm biosecurity. The rate of uptake of on-farm biosecurity varies between and within industries. Increasing this uptake is the remit of several programs, described in the following sections.

### BIOSECURITY EXTENSION AND ENGAGEMENT PROGRAMS

Through the leadership of their peak bodies, plant industries are becoming increasingly involved in biosecurity communication and engagement. Biosecurity extension and engagement programs are funded by industries to improve the management of, and preparedness for, biosecurity risks at the farm level. Biosecurity officers associated with some of these national programs are often funded by grower levies and so tend to work with producers of particular crops.

Some state governments have additional outreach programs with officers who work with groups of producers and others along the supply chain to strengthen the state's biosecurity system. For example, the NSW Local Land Services brings together agricultural production advice including biosecurity, natural resource management and emergency management for farmers, landholders and the community.

#### Grains Farm Biosecurity Program

The Grains Farm Biosecurity Program is funded by grain producers and managed by PHA and Grain Producers Australia, in partnership with the governments of five grain-producing states. Grains Biosecurity Officers are responsible for raising awareness of biosecurity management practices among grain growers and others along the supply chain. The officers engage growers at field days and conferences, giving presentations and demonstrations and running training sessions on biosecurity management practices that growers can use to protect their farms.

Since it began in 2007, thousands of in-crop and stored grain pest and disease surveys have been undertaken with industry, improving on-farm biosecurity as well as raising awareness in grain growing regions. Data from these surveys has and continues to be captured within PHA for inclusion in the national reporting tool *AUSPestCheck™*. Media, newsletter and Ground Cover articles are distributed year-round to raise awareness of seasonal biosecurity risks for grain growers. Biosecurity officers also undertake surveillance for exotic pests of grains and assist in any post-border incidents.

### Australian Biosecurity 2030 Workshop: Building a mass movement

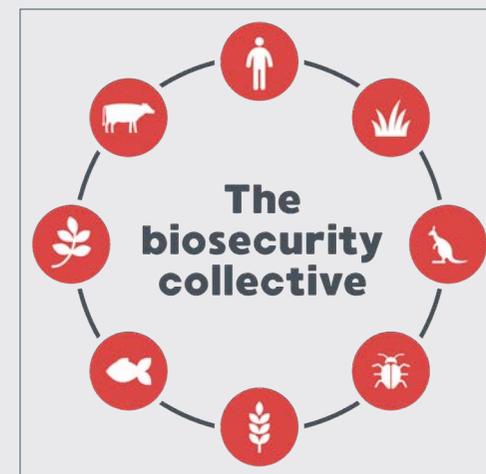
More than 250 biosecurity practitioners from across Australia and New Zealand convened in a virtual workshop in November 2020 to influence the future direction of Australia's biosecurity system through mobilising a 25-million strong biosecurity mass movement.

The workshop saw delegates from the 'biosecurity collective' from across the agriculture, human, weed, pest animal, wildlife, aquatic and environment sectors, build new partnerships and strengthen existing ones.

The workshop defined what the biosecurity system would look like in 2030 with discussions centred on creating and nurturing on-the-ground biosecurity and building the foundations of a mass movement. Guest speakers presented on successful Australian and New Zealand campaigns, followed by dialogues on strategies to mainstream biosecurity and motivating Australians to participate.

The consensus was to develop mechanisms to support biosecurity champions, expand the Biosecurity Warrior education program, share analysis and research on innovative and successful biosecurity initiatives, and encourage industry and community leaders to make a biosecurity commitment.

Outcomes from the workshop will feed into the 2021 Australian Biosecurity Symposium and will form the basis of the Biosecurity 2030 agenda.



## Farm Biosecurity Producer of the Year Award winners

Each year, PHA and AHA through the Farm Biosecurity Program, partners with the Australian Government to recognise farmers who demonstrate exceptional, proactive biosecurity practices.

In 2020, two winners in the plant category were announced: Templeton Ginger at the ABARES Conference dinner in March and Kees Weel (KW) Orchards at the Australian Biosecurity Forum in November.

Having experienced cucumber green mottle mosaic virus in the NT in 2014, Kees became a strong advocate for proactive biosecurity measures. When establishing the KW Orchards citrus and wine grape property at Trentham Cliffs in NSW, Kees and the property's management team developed a farm biosecurity plan by combining previous management experience and advice from the Biosecurity Manual for Citrus Producers.

Templeton Ginger is Australia's largest ginger producer and, with its long history, the company has experienced how detrimental pest and disease outbreaks can be for small businesses. Current directors John, Shane and Kylie Templeton have a strong focus on implementing biosecurity practices to ensure the longevity, economic viability and integrity of their business and the industry as a whole.



Shane and Julie Templeton with Minister Littleproud at the ABARES Conference dinner. Image courtesy of Steve Keough Photography

## Vegetable and Potato Farm Biosecurity Program

The Vegetable and Potato Farm Biosecurity Program is an extension and engagement program funded by vegetable growers and managed by PHA and AUSVEG to enhance the biosecurity management practices of producers and others along the supply chain in that industry.

It focuses on increasing the awareness and adoption of farm biosecurity among vegetable and potato growers and is increasingly being used as a platform for driving strategically important biosecurity initiatives.

Two dedicated biosecurity officers develop extension and training material, write articles on biosecurity themes for industry magazines, engage with producers at field days, and liaise with growers during pest incursions. In 2020, the officers completed a pilot urban biosecurity program after many of the recent exotic pest incursions were located at seaports, airports and other urban hotspots across Australian cities.

Throughout 2020, the officers took part in a variety of forums, biosecurity meetings and working groups. Their involvement also precipitated a number of initiatives with industry and researchers to extend surveillance capabilities and improve general surveillance reporting outcomes.

## National Citrus Biosecurity Program

As part of a partnership program funded by Hort Innovation and DAWE, a National Citrus Biosecurity Program was initiated in 2017 to improve biosecurity planning, preparedness and awareness in the citrus industry.

During 2020, the National Citrus Biosecurity Coordinator worked with government and industry to improve surveillance for exotic pests and raise awareness of pest threats among citrus growers and others along the supply chain.

The program re-established the First Detectors Network, a group of growers and crop scouts who monitor their crops regularly for any sign of exotic pests. The coordinator has also worked with the Urban Plant Health Network to improve awareness and surveillance in peri-urban and urban communities in VIC.

Should an exotic pest enter Australia, early detection of incursions helps to limit their spread and aims to minimise the cost of eradication. Improved surveillance also helps to provide ongoing evidence to demonstrate area freedom from pests, to support market access.

The National Citrus Biosecurity Coordinator is a member of the Citrus Pest and Disease Prevention Committee (CPDPC), an industry initiative established in 2018 to identify and coordinate biosecurity preparedness activities for High Priority Pests for the citrus industry. The CPDPC and the National Citrus Biosecurity Program are working to establish a network of traps for Asian citrus psyllid, the vector of huanglongbing.

The program is guided by the framework provided by the National Citrus Biosecurity Surveillance Strategy 2018–28, developed by PHA in consultation with Citrus Australia and DAWE. The strategy is aligned with the National Plant Biosecurity Strategy and National Plant Biosecurity Surveillance Strategy, as described in Chapter 1.

### National Bee Biosecurity Program

The National Bee Biosecurity Program is managed and administered by PHA on behalf of the Australian Honey Bee Industry Council. The program aims to help beekeepers manage pests and diseases that are already in Australia, and to provide information on exotic pests. Underpinning the program is the Australian Honey Bee Industry Biosecurity Code of Practice (the Code), which provides a framework for Australian beekeepers to engage in best-practice biosecurity.

Bee Biosecurity Officers (BBOs) are employed in all six states. The BBOs support beekeepers in understanding their biosecurity obligations under the Code and provide general advice on pest and disease management practices, while performing a variety of extension and education-based activities. These include attendance at industry field days, presentations at beekeeper club meetings, delivery of workshops and apiary visits.

To assist compliance with the Code and provide advice on keeping honey bees healthy, an online training course, Biosecurity for Beekeepers, was refreshed and made free to all beekeepers in Australia in 2020. The National Bee Biosecurity Program is funded by the honey bee industry through a component of the agricultural honey levy, with state governments contributing in-kind resources. The Victorian BBO position is co-funded through the Honey Bee Compensation and Industry Development Fund. The SA position is co-funded through the South Australian Apiary Industry Fund.

### Farm biosecurity programs for plant industries

Each year the number of industries establishing farm biosecurity programs continues to grow. Many industries now recognise the importance of tailoring information to raise awareness of on-farm biosecurity and improve management decisions to mitigate the biosecurity risks to their crop(s).

In 2020, PHA worked with melon, avocado, mango, grape and wine industry representatives to develop capability and deliver farm biosecurity information to producers.

### The Farm Biosecurity Program

PHA and AHA work together in a joint communication and awareness program, Farm Biosecurity, to provide biosecurity advice for both crop and livestock producers.

The program aims to help producers identify and reduce the risks to their enterprises posed by diseases, pests and weeds. The program website [farmbiosecurity.com.au](http://farmbiosecurity.com.au) provides an array of information and tools, including biosecurity manuals, templates for record keeping, templates for biosecurity gate signs, industry specific information, videos outlining best practice, a personal profile builder, a biosecurity planner and a planning app.

Resources produced by Farm Biosecurity are structured around the six biosecurity essentials:

- farm inputs
- people, vehicles and equipment
- production practices
- feral animals and weeds
- farm outputs
- train, plan and record.

By considering how these principles apply to their properties, producers can go a long way towards protecting their farms and their future from the impact of new or established diseases, pests and weeds.

The Farm Biosecurity Producer of the Year Award was established by PHA, AHA and DAWE to recognise the contribution of producers who demonstrate outstanding, proactive on-farm biosecurity practices (page 206).



## BIOSECURITY MANUALS FOR PRODUCERS

To help improve farm biosecurity, PHA in partnership with plant industries and governments, has released 21 crop-specific biosecurity manuals, listed in Table 58.

These documents are designed with growers and consultants in mind, explaining effective measures that can be incorporated in day-to-day operations to improve biosecurity and help protect farms from both exotic and established pests. Each manual also raises awareness of the exotic High Priority Pests identified in the biosecurity plan for that industry, increasing the likelihood of detecting an exotic pest incursion early.

The information from biosecurity manuals is also provided in the crops section of the Farm Biosecurity website [farmbiosecurity.com.au](http://farmbiosecurity.com.au) and complete manuals are available for download.

**Table 58. Biosecurity manuals for producers**

Manual	Version
Biosecurity Induction Manual for Bundaberg Horticultural Farms	1.0
Biosecurity Manual for Beekeepers	1.1
Biosecurity Manual for Citrus Producers	2.0
Biosecurity Manual for Grain Producers	4.0
Biosecurity Manual for Sugarcane Producers	1.0
Biosecurity Manual for the Nursery Production Industry	1.0
Biosecurity Manual for the Papaya Industry	1.0
Biosecurity Manual for the Plantation Timber Industry	1.0
Biosecurity Manual for the Viticulture Industry	1.0
Cherry Growers' Biosecurity Manual	2.0
Farm Biosecurity Manual for the Banana Industry	1.0
Farm Biosecurity Manual for the Cotton Industry	1.1
Farm Biosecurity Manual for the Northern Adelaide Plains Vegetable Growers	1.0
Farm Biosecurity Manual for the Organic Grains Industry	1.0
Onion Growers' Biosecurity Manual	1.0
Orchard Biosecurity Manual for the Almond Industry	1.0
Orchard Biosecurity Manual for the Apple and Pear Industry	2.0
Orchard Biosecurity Manual for the Avocado Industry	1.0
Orchard Biosecurity Manual for the Mango Industry	1.0
Orchard Biosecurity Manual for the Summerfruit Industry	1.0
Potato Growers' Biosecurity Manual	1.1

## MANAGING PESTS ON FARM

Australian farmers manage pests with a variety of methods tailored to the type of pest, the crop and agroecological conditions. Most growers use an integrated pest management approach, which means that they combine chemical, cultural, mechanical and biological controls in a flexible way that can change over time.

### Chemical control

For the management of many plant pests, pesticides are the fastest and easiest option for control and most growers use at least one type of chemical to maintain productive agriculture. Pesticide availability in Australia is regulated by the Australian Pesticides and Veterinary Medicines Authority (APVMA), an independent statutory authority. As the national regulator of agricultural and veterinary chemicals, the APVMA regulates pesticides in line with responsibilities described in the *Agricultural and Veterinary Chemicals (Administration) Act 1992* and the *Agricultural and Veterinary Chemicals Code Act 1994*.

The APVMA exists to ensure that Australia has access to safe and effective agricultural and veterinary chemicals to control pests and diseases of animals and plants. It also monitors and enforces compliance with the Agricultural and Veterinary Chemicals Code and other legislation. Records are kept of approved agricultural and veterinary constituents, registered products and approved labels. More information is available from [apvma.gov.au](http://apvma.gov.au)

All agricultural chemicals sold or used in Australia must be registered with the APVMA. National registration ensures that all agricultural chemical products, when used as directed on the product label, will be effective and have no harmful or unintended effects on people, animals, crops, the environment or international trade. The actual use of chemicals is regulated by state and territory governments.

It is estimated that up to 73 per cent (\$20.6 billion)<sup>46</sup> of Australia's total value of crop production is attributable to the use of crop protection products. Table 59 illustrates the amount and type of agricultural chemicals used for controlling plant pests in Australia. This total expenditure on pesticides for plants represents over eight per cent of the gross value of production for all crops in Australia.<sup>47, 48</sup>

### Cultural and mechanical control

Cultural and mechanical control refers to the practice of modifying the growing environment of production crops to reduce the prevalence of unwanted pests. Examples include tillage methods and changing soil pH levels, irrigation practices and fallow periods, which make the environment less favourable for the survival, growth and reproduction of pest species. These practices can provide significant relief from some pests when used effectively.

### Biological control

Biological control is a method of controlling pests using natural enemies. Natural enemies of pests are known as biological control agents and include predators, parasitoids and pathogens. Biological control has been highly successful in many instances, with a number of pest problems permanently solved by importation and successful establishment of biological control agents. Successes tend to be confined to particular ecosystems or pest situations, and when they are effective, can provide long-term and even permanent results.

<sup>46</sup> CropLife Australia, 2018. Economic activity attributable to crop protection products. Deloitte Access Economics Pty Ltd. [agriculture.gov.au/SiteCollectionDocuments/abares/data/agricultural-commodities-statistics.xlsx](http://agriculture.gov.au/SiteCollectionDocuments/abares/data/agricultural-commodities-statistics.xlsx)

<sup>47</sup> Australian Pesticide and Veterinary Medicines Authority, Gazette No 5 March 2020. Accessed online 31 March 2020, [apvma.gov.au/node/64531](http://apvma.gov.au/node/64531)

<sup>48</sup> Australian Bureau of Agricultural and Research Economics and Sciences. Agricultural commodities December quarter 2020. Accessed online 21 June 2021, [abs.gov.au/statistics/industry/agriculture/value-agricultural-commodities-produced-australia/latest-release](http://abs.gov.au/statistics/industry/agriculture/value-agricultural-commodities-produced-australia/latest-release)

**Table 59. Sales of plant chemicals in Australia, 2016–20**

		Herbicide	Insecticide	Fungicide	Mixed function pesticide	Miticide	Molluscicide	Nematicide	Total
2016	No. of products	3,301	1,445	939	149	131	54	18	<b>6,037</b>
	Value of product sales (\$ million)	1,717	337	254	32	19	12	4	<b>2,375</b>
2017	No. of products	3,363	1,482	967	148	131	54	15	<b>6,160</b>
	Value of product sales (\$ million)	1,683	484	343	39	36	16	2	<b>2,603</b>
2018	No. of products	3,517	1,515	1,021	145	131	52	16	<b>6,397</b>
	Value of product sales (\$ million)	1,714	413	269	37	20	14	2	<b>2,469</b>
2019	No. of products	3,643	1,570	1,088	145	134	51	17	<b>6,648</b>
	Value of product sales (\$ million)	1,507	358	242	32	25	13	3	<b>2,180</b>
2020	No. of products	3,772	1,589	1,133	149	133	57	16	<b>6,849</b>
	Value of product sales (\$ million)	1,984	315	280	31	27	14	4	<b>2,655</b>



Image courtesy of Victorian Strawberry Industry Development Committee

## Australia's weed biosecurity system

The scope of Australia's plant biosecurity system covers more than just invertebrates and pathogens, with a range of prevention, surveillance, eradication and ongoing management activities in place to address the threats posed by weeds. It has been estimated that the annual cost to the Australian economy from the agricultural impacts of weeds is almost \$5 billion,<sup>49</sup> with a comparable cost likely to be incurred on the environmental sector.

A weed is a plant that requires some form of action to reduce its negative effects on the economy, the environment, human health or amenity. Weeds reduce the establishment, growth and yields of field crops, pastures and forestry, and can invade natural environments, outcompeting native plants and disrupting ecosystem processes.

Around 20 new naturalisations of garden plants are recorded each year, albeit a small number from the large pool of over 30,000 plant species that have been imported for cultivation in Australia.

Australia's weed biosecurity system aims to:

- prevent entry of high weed risk species
- detect and eradicate or contain significant weeds in the early stages of invasion
- mitigate the impacts of established weeds.

Responsibility for weed biosecurity is shared between governments, industries and the community. Legislation sets out the various roles of governments in managing weeds across Australia. State and territory government departments of primary industries and environment, along with local governments or natural resource management authorities, have responsibility for weed biosecurity policy and management.

Weed management is also a component of on-farm biosecurity. Producers of both crops and livestock take actions to prevent the entry of new weeds and manage established weeds on their properties. Plant industries play an integral part in the weed detection and reporting network.

<sup>49</sup> McLeod R (2018) Annual Costs of Weeds in Australia. eSYS Development Pty Limited. Published by the Centre for Invasive Species Solutions, Canberra, Australia

## NATIONAL APPROACH TO ADDRESSING WEED ISSUES

The Environment and Invasives Committee (EIC) provides an intergovernmental mechanism for identifying and resolving weed issues at a national level. It comprises members from the Australian Government, all state and territory governments, and observers from the CSIRO, PHA, the Centre for Invasive Species Solutions, Wildlife Health Australia, AHA, and ABARES.

EIC oversees the administration of the Australian Weeds Strategy 2017–27, which is the overarching policy for weed management in Australia. It outlines goals and actions required to keep Australia's economic, environmental and social assets secure from the impacts of weeds. The strategy is reviewed every 10 years to ensure it remains relevant to Australia's needs.

The strategy provides information on where improvements can be made at the national level that will result in benefits across Australia. It draws attention to areas that require national collaboration and will drive the development of consistent and coordinated national approaches by clarifying priorities, roles and responsibilities.

The strategy is available from [agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds](http://agriculture.gov.au/pests-diseases-weeds/pest-animals-and-weeds)



*Ornamentals like agapanthus can easily escape garden beds and become a weed in the environment. If it was being imported today it would be subjected to a Weed Risk Assessment.*

## PREVENTING THE ENTRY OF NEW WEEDS INTO AUSTRALIA

Around 65 per cent of current weed species were originally imported for use as garden ornamentals, with introductions for potential pasture species being another key source. However, most of these species were imported decades ago and modern improvements to biosecurity arrangements have significantly reduced this risk.

The DAWE develops and implements biosecurity policies for plant imports (seeds, tissue culture or any other material for propagation) into Australia. Since 1997, new plant species have been subject to a Weed Risk Assessment process that determines the weed potential of any proposed new plant imports.

If a plant species is not listed in the Biosecurity Import Conditions database (BICON) as being permitted to enter Australia, it will require a weed risk assessment to determine its potential weed risk. Australia's Weed Risk Assessment system was developed following extensive consultation and collaboration of weed experts and has been adapted for use in other parts around the world.

All propagative material entering the country must meet standard biosecurity import conditions, including verification of the botanical name (species). To prevent the entry of weeds that may be present as a contaminant, consignments must also be inspected by a biosecurity officer before permission is given for it to enter.

Generally, larger seed lots (more than 10 kilograms) undergo purity analysis under a strict regime of statistical sampling and analysis at a laboratory accredited by the International Seed Testing Association. If any weed species are detected either by visual inspection or purity analysis, the seed lot may be denied entry until the weed seeds have been removed.

Seed consignments imported for other uses, such as for human consumption, may also be directed for mandatory treatment if weed seeds are found. Treatments devitalise the seeds to ensure they are unable to grow and spread, should they be inadvertently released in the environment.

## WEED SURVEILLANCE

State and local government weed officers conduct surveillance throughout Australia as part of routine inspections of properties for declared plants. Weeds are also targeted in the surveillance activities of the Northern Australia Quarantine Strategy (page 146).

Community-based weed spotter programs are active in many states and local areas. Volunteers in these groups report new weed detections in their areas and are generally supported in their activities by government agencies through state herbaria. An example is the Weeds at the Early Stage of Invasion program run by the Victorian Government.

Surveillance also extends to online trade, with governments sharing information between jurisdictions when declared plants are found to be advertised for sale.

## ERADICATION AND CONTAINMENT OF WEEDS

Eradication of weeds is only possible if incursions are detected early, and a response is mounted before they have a chance to spread too far.

The National Tropical Weeds Eradication Program continued in 2020, targeting five weed species native to tropical America that have been detected in north QLD (and one also in northern NSW). The program is managed by the Queensland Government and is cost-shared by the Australian, QLD, NSW, NT and WA governments. The species are:

- limnocharis (*Limnocharis flava*), a wetland plant
- miconia (*Miconia calvescens*, *M. nervosa*, *M. racemosa*), a rainforest tree and shrubs
- mikania vine (*Mikania micrantha*).

The National Red Witchweed Eradication Program also continues. The response is led by the Queensland Government and has been funded by the Australian, QLD, NSW and NT governments, Meat and Livestock Australia, Grain Producers Australia and Canegrowers. After four years of treatment there has been a 99 per cent reduction in the number of red witchweed (*Striga asiatica*) detections and a demonstrated 85 per cent decline in the soil seedbank.

Hawkweeds, Hieracium species, are also the subject of eradication programs in NSW, VIC and TAS.

Weed containment programs occur at state, regional and local levels under each jurisdiction's legislation, aimed at preventing further spread of significant weeds that cannot be eradicated. One example is the ongoing detection and treatment of parthenium weed (*Parthenium hysterophorus*) incursions from established populations in QLD into NSW. Similarly, the NT has on-going responses to detect and treat new cross-border incursions of parthenium, rubber vine (*Cryptostegia grandiflora*) and Siam weed (*Chromolaena odorata*).

Local or regional government organisations lead coordinated control programs for declared weeds across multiple properties within which control is generally the legal responsibility of each land owner.



Hawkweeds, Hieracium species, are the subject of eradication programs in NSW, VIC and TAS.

## MANAGING ESTABLISHED WEEDS

The management of established weeds is a shared responsibility between landholders, community, industry and government. At the national level, the Australian Government administers a number of programs, including the National Landcare Program and the Established Pest Animals and Weeds Management Pipeline Program, to assist with the management of established weeds for the benefit of the environment, agricultural productivity and local communities. Through these programs, the Australian Government invests in RD&E activities, national coordination and the development and implementation of policy and associated programs.

Combating weeds is an integral part of most farming systems. Problem weeds and their management differ greatly among industries and regions, but most production systems take an integrated approach of chemical and non-chemical control methods. Weeds are commonly managed using a combination of competition with other plants, herbicide applications, soil tillage, slashing, grazing, weed seed capture or burning. No-till production systems, which use herbicides to control weeds, are now common in Australia.

Plant industry research funding bodies, such as the Grains Research and Development Corporation, invest considerably in RD&E to improve weed management systems, particularly for herbicide resistant and other difficult to control weeds. Co-investment by industries and governments is often used for the biological control of high priority weeds, which is particularly important in rangeland grazing systems and natural ecosystems where intensive weed control measures are cost-prohibitive. See Table 60 (page 230) for examples of RD&E projects targeting weeds.

Weed management in natural ecosystems is undertaken by a range of groups including private and government land owners, pastoralists, rangers, volunteers and contractors. These groups undertake sensitive restoration activities to maintain local bushland and control weeds across the rangelands. For example, in Indigenous Protected Areas and other areas under management by traditional owners in the NT, Indigenous ranger groups are employed to reduce the impact of established weeds across extensive areas of country. On the northern coastline, ranger groups also conduct surveillance for new incursions in collaboration with the states and territories and the Australian Government through the Northern Australian Quarantine Strategy.



