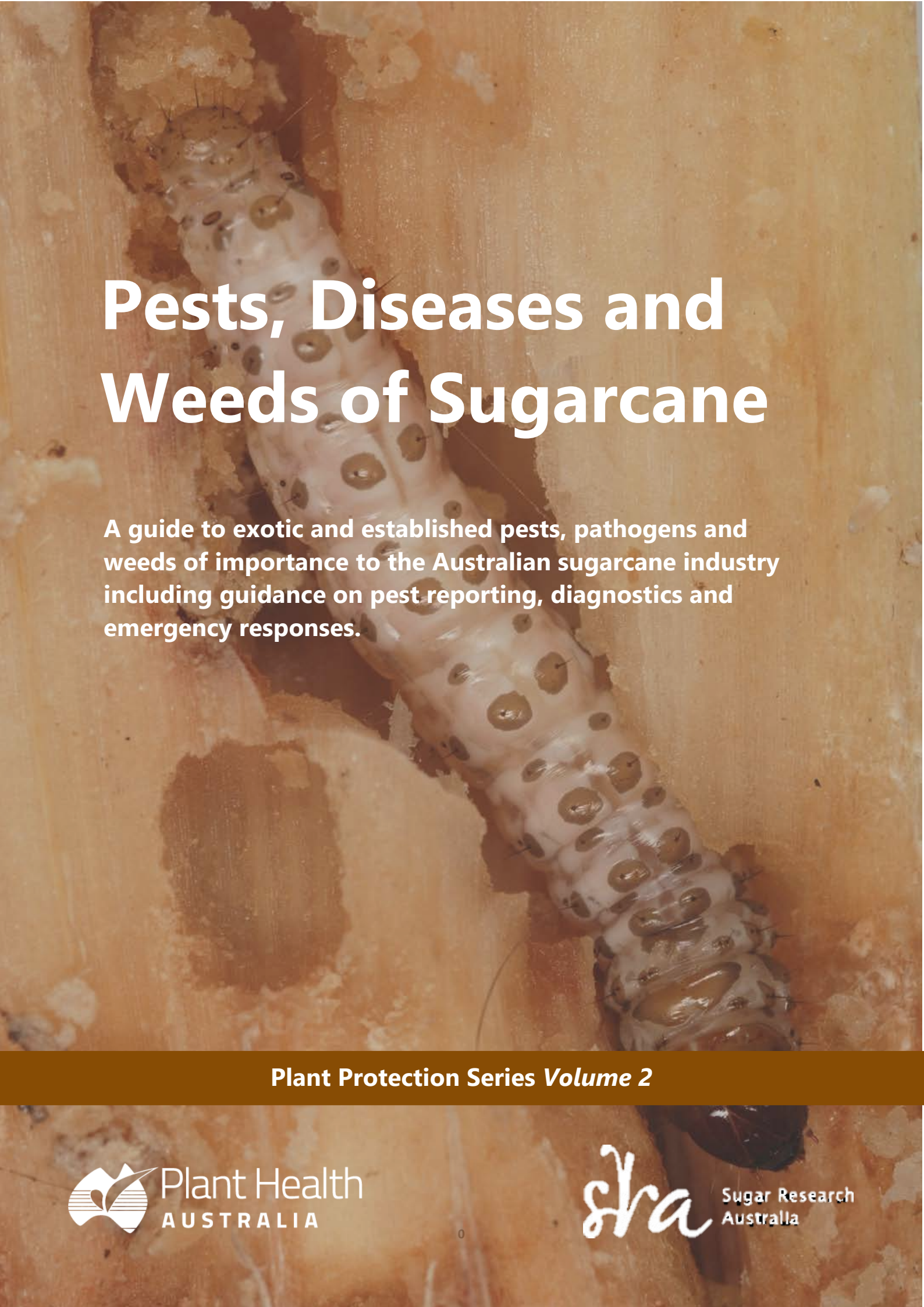


Pests, Diseases and Weeds of Sugarcane

A guide to exotic and established pests, pathogens and weeds of importance to the Australian sugarcane industry including guidance on pest reporting, diagnostics and emergency responses.

Plant Protection Series *Volume 2*

Plant Health AUSTRALIA

Sugar Research Australia

Front and back cover images by Sugar Research Australia.

Plant Health Australia is the national coordinator of the government-industry partnership for plant biosecurity in Australia. As a not-for-profit company, PHA services the needs of Members and independently advocates on behalf of the national plant biosecurity system.

PHA's efforts help minimise plant pest impacts, enhance Australia's plant health status, assist trade, safeguard the livelihood of producers, support the sustainability and profitability of plant industries and the communities that rely upon them, and preserve environmental health and amenity.

www.planthealthaustralia.com.au

CANEGROWERS is the peak body for Australian sugarcane growers. CANEGROWERS Australia represents around 80% of Australia's sugarcane growers. CANEGROWERS is a highly successful lobby, representation and services group, with 19 offices across Queensland and New South Wales. CANEGROWERS represents the Australian sugarcane industry as a member of PHA.

www.canegrowers.com.au

Sugar Research Australia (SRA) invests in and manages a portfolio of research, development and extension projects that drive productivity, profitability and sustainability for the Australian sugarcane industry. SRA is an industry-owned company, funded by a government matched statutory levy paid by growers and milling businesses.

sugarresearch.com.au

Australian Sugar Manufacturers, formerly known as the Australian Milling Council (ASMC), represents Australia's raw sugar manufacturers and exporters and is an advocate for a range of policy, regulatory and legislative topics that affect the sugar value chain.

sugarmanufacturers.org

This guide was developed by Plant Health Australia, CANEGROWERS, Sugar Research Australia, Australian Sugar Manufacturers, the Queensland Department of Primary Industries with financial support from Sugar Research Australia Limited.

This publication is designed for use by farmers and their staff, contractors, millers, researchers and consultants working in the sugarcane industry. It shows simple procedures that you can use to minimise the risk of introducing and spreading weeds, pests and diseases onto properties.

Contents

Endemic Pests and Diseases of Australian Sugarcane

The following list includes pests which are either currently under quarantine arrangements or which Australian sugarcane producers already manage. Identification of these pests supports mechanisms to be put in place to better align industry and government resources and provide a stronger base for biosecurity risk management for the industry.

To be considered as part of this list, the pest should be economically important to the Sugarcane industry and meet at least one of the following criteria:

- currently under quarantine arrangements or restricted to regions within Australia,
- notifiable by law,
- have market access implications,
- able to be prevented from entering a farm through good biosecurity practices

There are currently **eight** pests of biosecurity significance identified for the Australian sugarcane industry. Additional information on many of these pests is included on the Sugar Research Australia and Plant Health Australia websites, as well as on the Farm Biosecurity website.

Table 1. Pests of biosecurity significance to Australian Sugarcane.

Coleoptera	
	Rhabdoscelus obscurus (Sugarcane weevil borer)
Bacteria	
	Leifsonia xyli subsp. xyli (Ratoon stunting disease)
	Xanthomonas albilineans serotype 1 (Leaf scald)
Fungi	
	Sporisorum sacchari (Sugarcane smut)
Oomycetes	
	Pachymetra chaunorhiza (Pachymetra root rot)
Viruses	
	Fiji disease virus FDV (Fiji leaf gall)
	Sugarcane striate mosaic-associated virus
	Sugarcane mosaic virus Strain A

Rhabdoscelus obscurus (Sugarcane weevil borer)

Status Established in Australia

Group Coleoptera

Impact

Reduced sugar content with losses of up to 2 CCS units.

Symptoms

- Larvae feed inside the internodes of the stalk (often only in the lowest ones) and fill the stalk with frass (waste)
- Eggs are laid into cavities chewed in the stalk or into damaged cane

Where is it now?

In districts from Plane Creek (near Mackay) to Mossman.

How does it spread?

- Infested planting material
- Adult weevils can fly

How is it managed?

- Managing harvest residues
- Reduce stalk damage and lodging as damage cane attracts the pest
- Grow resistant varieties
- Application of insecticides

Figure 1. *Adult sugarcane weevil borer. Adults are dark coloured, 12-15 mm long, with a long snout. Image by Sugar Research Australia.*

Figure 2. *Damage caused by larvae feeding in stalk. Image by Sugar Research Australia.*

Leifsonia xyli subspecies *xyli* (Ratoon stunting disease)

Status Established in Australia

Group Bacteria

Impact

Average yield loss of 15-20% (up to 60% if conditions are favourable for the disease).

Symptoms

- Visible stunting, causing an uneven appearance in the cane fields
- Red-orange dots are often visible in the nodal tissue, visible when stalks are sliced in half

Figure 3*. Ratoon stunting disease causes small orange to brown dots in the nodes when stalks are sliced open. Image by Sugar Research Australia.*

Where is it now?

All sugar growing districts of eastern Australia.

How does it spread?

By planting infected cuttings and/or using contaminated cutting implements.

How is it managed?

- Plant approved disease-free seed
- Destroy all volunteer cane
- Disinfect planting and harvesting equipment

Xanthomonas albilineans serotype 1 (Leaf scald)

Status Established in Australia

Group Bacteria

Impact

Significant yield losses. Complete crop losses can occur in highly susceptible varieties.

Symptoms

- Chlorotic (white) stripes and patches on leaves
- White pencil-line visible along the middle of the white leaf stipes
- When stalks are sliced, the vascular bundles are red in the nodes
- Side-shooting from the base of the plant
- Causes poor ratooning and stalk death in susceptible varieties

Where is it now?

Present in all sugarcane growing regions in Australia.

Figure 4. *Image by CANEGROWERS.*

How does it spread?

- Infected planting material
- Contaminated cutting implements including knives, harvesters, whole stalk and billet planters
- Wind-blown rain

How is it managed?

- Use disease free planting material
- Grow resistant varieties
- Disinfect planting material

Sporisorium scitamineum (Sugarcane smut)

Status Established

Group Fungi

Impact

Yield losses of 30-100% reported.

Symptoms

- A black whip-like structure develops from the growing point of the sugarcane plant
- Severe stunting, thin grassy stalks and death of plants

Where is it now?

All sugar growing districts of Australia.

How does it spread?

- Wind dispersal
- Planting infected cane cuttings
- Can be spread on machinery, shoes etc.

***Figure 5**. A black whip-like structure is a characteristic symptom of sugarcane smut. Image by CANEGROWERS.*

How is it managed?

- Grow resistant varieties
- Hot water treatment can be used to eliminate smut from infected planting material but treated plants can be reinfected after planting
- Fungicides such as, Sinker® (a.i. Flutriafol) can protect plants from reinfection for several months and is approved for use against sugarcane smut.

Pachymetra chaunorhiza (Pachymetra root rot)

Status Established

Group Oomycetes

Impact

Significant yield losses of up to 40% have been reported in susceptible varieties.

Symptoms

- Larger roots exhibit a soft flaccid rot
- Infection may cause excessive stool tipping and loss of plants at harvest and poor ratooning

Where is it now?

It is widespread in the Northern, Herbert and Central Queensland districts and in the Condong mill area in NSW. There is limited distribution in Burdekin and other NSW cane growing areas.

How does it spread?

It is spread in soil carried on machinery or attached to stalks of cane.

***Figure 6**. Image by Sugar Research Australia.*

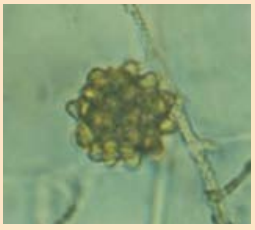


***Figure 7**. Pachymetra oospore. Image by Sugar Research Australia.*

How is it managed?

- Strategic planting of resistant varieties
- No fungicides are effective against *Pachymetra* at economical rates

Fiji disease virus FDV (Fiji leaf gall)

Status Established

Group Viruses

Impact

Significant or complete yield losses in susceptible varieties.

Symptoms

- Green or white galls between 1-200 mm long, 1-4 mm wide and 1-2 mm high, form on the underside of the leaf blade and midrib
- Leaves at the top of the plant look ragged
- Causes stunting, profuse tillering and plant death

Where is it now?

Reported from New South Wales north to Nambour. Has occurred from Maryborough to Mackay in Queensland but has not been reported in these districts for many years. Has never been recorded in the districts north of Bowen.

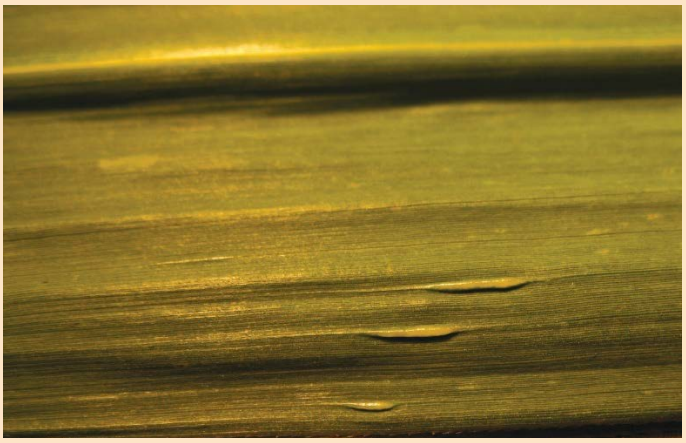


***Figure 8**. Fiji leaf galls on a leaf. Image by Sugar Research Australia.*

***Figure 9.** Sugarcane planthopper P. saccharicida vectors Fiji leaf gall. Image by Sugar Research Australia.*

How does it spread?

This virus is spread between plants by insect vectors such as the sugarcane planthopper (*Perkinsiella saccharicida*). Infected planting material also spreads the disease.

How is it managed?

Use resistant varieties and disease-free planting material.

Sugarcane striate mosaic-associated virus

Status Established

Group Viruses

Impact

Significant yield losses of up to 100% due to stunting and plant death in susceptible varieties. Failure of ratoon crops.

Symptoms

- Short, fine (0.5 mm wide by 0.5-2 mm long), light green striations on leaves
- Symptoms first appear on the young leaves
- Susceptible plants become stunted and die

Where is it now?

The Burdekin district.

How does it spread?

- Sett and soil-transmitted
- Contaminated machinery
- Soil or feral animals such as pigs

***Figure 10**. Image by Sugar Research Australia.*

How is it managed?

- Grow resistant varieties
- Use disease-free seed cane
- Clean machinery
- Feral animal control

Sugarcane mosaic virus Strain A

Status Established

Group Viruses

Impact

Significant yield losses of 20-30% in susceptible varieties.

Symptoms

Mottled pattern on leaves with light green to yellow and dark green patches.

***Figure 11.** Leaf symptoms. Image by Bugwood.org.*

Where is it now?

This virus has been reported from all regions; however, it is currently restricted to the Bundaberg and Childers districts.

How does it spread?

This virus is transmitted by aphids and infected planting material.

How is it managed?

- Grow resistant varieties and use disease-free planting material
- If infected plants are found, destroy them immediately to reduce spread
- Manage weed hosts of the vectors

Exotic Pests of Sugarcane

Exotic pests pose a major threat to the Australian sugarcane industry. The climate of Australia's production regions would allow each of these pests and diseases to survive, spread and establish, should they be introduced into the country.

Make sure that you, your staff and your contractors are familiar with high priority exotic pests and diseases, any of which would have serious consequences should they make it through border controls.

There are currently **29** high priority pests identified for the Australian sugarcane industry. Additional information on many of these pests is included on the Sugar Research Australia and Plant Health Australia websites, as well as on the Farm Biosecurity website.

Termites

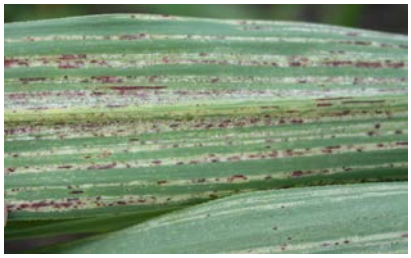
Borers

Whiteflies and Aphids

Planthoppers and Leafhoppers

Bacteria

Fungi



Phytoplasma

Termites

1) Asian subterranean termite *Coptotermes gestroi*

Group Blattodea

Family Rhinotermitidae

Host range

Hosts include sugarcane and maize.

Impact

These termites feed on the inner tissue of sugarcane plants and create feeding tunnels which reduces the quality of sugarcane destined for milling (Naidu, Prakash & Padayachi, 2016). Sugarcane is considered attractive to termites due to its high cellulose content (Naidu, Prakash & Padayachi, 2016). Infestations of sugarcane fields by this species of termite has been reported in Fiji (Naidu, Prakash & Padayachi, 2016).

Symptoms

- Outer leaves exhibit a yellowed and dried appearance (Naidu, Prakash & Padayachi, 2016).

How does it spread?

- May spread locally by crawling
- Likely to be transported over longer distances in infested plant material, soil, machinery and wood packaging

Figure 12. *Coptotermes gestroi. Image by the Pest and Disease Image Library (PaDIL). Scale bar = 1mm. View this image online at: https://www.padil.gov.au/pests-and-diseases/pest/136464.*

Factsheet on Subterranean termites

Australian Department of Agriculture, Fisheries and Forestry

https://www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/plant/identify/subterranean-termites

Borers

2) Sugarcane longhorn stem borer *Dorysthenes buquetii* (syn. *Dorysthenes buqueti*)

Group Coleoptera

Family Cerambycidae

Host range

Hosts include sugarcane (*Saccharum officinarum*), common bamboo (*Bambusa vulgaris*) and cassava.

Impact

- Can cause considerable yield loss

Symptoms

- Bores into the stalk of the plant and in doing so, causes significant damage

Figure 13. *Dorysthenes buqueti Type specimen held in the Natural History Museum of London as photographed by J. Pirki and published online in Prioninae of the world.*

How does it spread?

- May spread over short distances through flying
- Dispersal over longer distances may occur with human-assisted movement of eggs, larvae, pupae and adults on plants, within packing materials or wood products.

3) Gold-fringed rice borer *Chilo auricilius*

Group Lepidoptera

Family Crambidae

Host range

Sorghum bicolor (sorghum), *Zea mays* (maize), *Oryza sativa* (rice), Poaceae (grasses) and *Saccharum officinarum* (sugarcane).

Impact

- In sugarcane, damage at early growth stages can kill leaves and may produce 'dead hearts'
- In sugarcane, larvae produce galleries through their feeding

Figure 14. *Image by Sugar Research Australia.*

Symptoms

- If leaf sheaths are stripped away, bore holes in the internodes may be apparent
- Damaged internodes may show reddened tissue and emit a rancid odour
- In older cane there may be no obvious external symptoms

How does it spread?

- This borer may disperse locally through the flight of adults
- Long distance spread is most likely through the movement of infested plants and plant products.

4) Yellow top sugarcane borer *Chilo infuscatellus* (syn. *Chilo tadzhikiellus*)

Group Lepidoptera

Family Crambidae

Host range

Wide host range including sugarcane (*Saccharum officinarum*), grains (including oats, millet, sorghum, barley, maize, rice) and weeds such as *Cyperus rotundus* (purple nutsedge).

Impact

- Young larvae eat small holes in leaves, especially in the leaf sheath. At a later stage, growing points of the plant are killed.
- Older larvae tunnel in stems eating out extensive galleries and excreting frass. Tunneled stems may break, especially in high winds.

Figure 15. *Image by Sugar Research Australia.*

Figure 16. *Damage caused by the yellow top borer. Image by S Eyres, Department of Agriculture and Food, Western Australia.*

How does it spread?

- Local dispersal may occur through flight
- Long distance dispersal is most likely through the movement of infested plants and plant products

Symptoms

- Death of terminal leaves
- Presence of 'dead hearts'
- Frass that resembles moist sawdust

5) Spotted borer *Chilo sacchariphagus*

Group Lepidoptera

Family Crambidae

Host range

Hosts include sugarcane (*Saccharum officinarum)* and grains (including rice, sorghum and maize).

Impact

- Larval feeding may kill growing points and lead to the formation of 'dead hearts' formed from the dead, rolled leaves at the growing point
- Larvae mainly bore into the softer elongating internodes at the tops of canes which may result in reduced growth, growth of lateral shoots, constriction of the stem and shortening of internodes at the point of attack, and death of the top, which may kill the whole cane.
- Extensive tunnelling may result in stem breakage and lodging
- Damage is generally most severe on canes that are growing slowly and is therefore often most apparent during dry periods

Figure 17*. Image by Sugar Research Australia.*

Symptoms

- Larval feeding on young leaves, particularly the leaf epidermis, produces repetitive patterns of small holes or 'windowpanes'
- Larvae tunnelling into the internodes of the plant produces extensive galleries and external holes around which frass can be seen

How does it spread?

- Local dispersal may occur through flight
- Long distance spread is likely through the movement of infested plants and plant products

6) Dark headed rice borer *Chilo terrenellus*

Group Lepidoptera

Family Crambidae

Host range

Hosts include sugarcane, grains (including rice and maize) and grasses (including *Eriochloa* spp. and *Panicum* spp.).

Impact

This species of borer bores into cane stems which negatively impacts sugar content and cane quality (Grimshaw & Donaldson, 2007). These borers have the potential to cause significant damage to sugarcane with some reports of larvae causing damage in up to 80% of stalks in Papua New Guinea (Grimshaw & Donaldson, 2007).

Symptoms

- Presence of dead tops and broken stalks (Grimshaw & Donaldson, 2007)
- Entry holes in the stem and presence of frass (Grimshaw & Donaldson, 2007)

Figure 18*. Image by Sugar Research Australia.*

How does it spread?

- Local dispersal may occur through flight
- Long distance spread likely through the movement of infested plants and plant products

7) Spotted sugarcane stem borer or Plassey borer *Chilo tumidicostalis*

Group Lepidoptera

Family Crambidae

Host range

Hosts include sugarcane (*Saccharum officinarum*).

Impact

- Bores into cane stems, causing significant damage and a reduction in cane yield (Chand et. al, 2014)
- Causes a reduction in cane weight and juice quality (Gupta & Sarma, 2007)

Figure 19. *Image by Sugar Research Australia.*

Symptoms

- Sugarcane plants exhibiting a dried crown and drying of top leaves (Das & Lala, 2024)
- Presence of red frass (Das & Lala, 2024)
- Internodes that break easily (Das & Lala, 2024)

How does it spread?

- Local dispersal may occur through flight
- Long distance dispersal likely through the movement of infested plants and plant products

8) African sugarcane borer *Eldana saccharina*

Group Lepidoptera

Family Pyralidae

Host range

Wide host range including sugarcane (*Saccharum officinarum*), sedges (including Umbrella flatsedge (*Cyperus alternifolius*), *Cyperus digitatus* and papyrus (*Cyperus papyrus*)), grains (including rice, sorghum and maize), grasses (including Guinea grass (*Megathyrsus maximus*)) and bulrushes (including broadleaf cattail (*Typha latifolia*)).

Figure 20. *Image by Sugar Research Australia.*

Impact

- This borer can cause yield loss and a decline in cane quality because of its feeding on tissue within the sugarcane stalk (South African Sugar Research Institute, 2005)
- Under high pest pressure, total crop failure can result
- Damage and consequent crop loss in sugarcane generally increases with crop age. The tendency of this species to infest mature crops is accounted for in part by the preference of females to oviposit on dry dead leaves.
- Sugarcane under stress conditions such as drought are considered most vulnerable (South African Sugar Research Institute, 2005)

Symptoms

- Hollowed out sugarcane stems (South African Sugarcane Research Institute, 2005)
- Presence of frass (Sampson & Jumar, 1985)

How does it spread?

- Local dispersal may occur through flight
- Long distance spread likely though the movement of infested plants and plant products

9) Sugarcane root borer *Polyocha depressella* (syn. *Emmalocera depressella*)

Group Lepidoptera

Family Pyralidae

Host range

Hosts include sugarcane (*Saccharum officinarum*).

Impact

This borer feeds on and infests the root system of sugarcane but does not actually bore into roots. Heavy infestations can cause significant destruction.

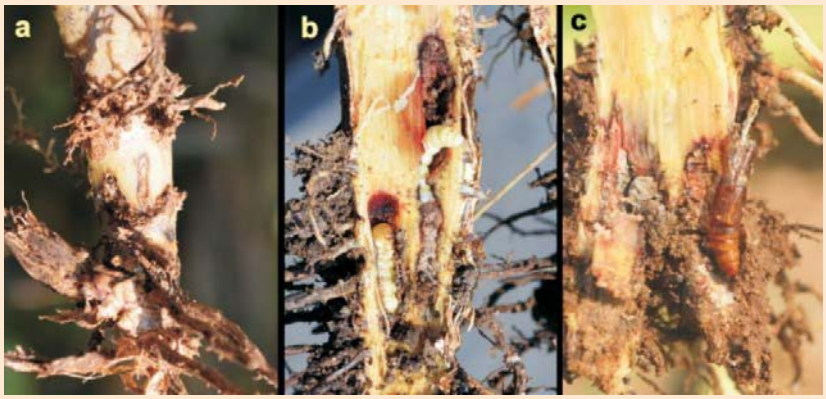


Figure 21. Symptoms of damage in sugarcane caused by P. depressella. a- Externally-visible bore holes, b - Internal tunnels, c - Pupal case. Images by Srikanth, Jayanthi & Salin (2014).

Symptoms

Deadhearts, yellowing of leaves and externally visible bore holes (Srikanth, Jayanthi & Salin, 2014).

How does it spread?

- Local dispersal may occur through flight
- Long distance dispersal likely through the movement of infested plants and plant products

10) Top borer *Scirpophaga excerptalis*

Group Lepidoptera

Family Crambidae

Host range

Hosts include sugarcane, grains (including rice, sorghum and wheat), grasses (including Johnson grass (*Sorghum halepense)* and mango.

Impact

- Larvae tunnel and bore into stems. In general, only one mature larva survives in a single stem because of food competition.
- Damage is generally most severe in young plants that thrive in a humid environment.

***Figure 22**. Image by Sugar Research Australia.*

Symptoms

- Presence of egg clusters on the upper side of the leaves near the growing point
- Withering and stunting of the top shoot, whereas the internodes beneath may produce new leaves

How does it spread?

- Local dispersal may occur through flight
- Long distance spread likely through the movement of infested plants and plant products

11) Pink stalk borer *Sesamia grisescens*

Group Lepidoptera

Family Noctuidae

Host range

Hosts include sugarcane and grasses (including *Pennisetum purpureum* and *Panicum maximum*).

Impact

- Bores into cane stems
- Stalks which have been bored into usually have a low sucrose content, high levels of impurities and a high fibre content

***Figure 23**. Image by Sugar Research Australia.*

Symptoms

- Appearance of frass from feeding of young larvae on the inner tissue of the leaf-sheath
- As the larvae grow bigger, they start boring into the stalk near the node of the fully expanded internode

How does it spread?

- Local dispersal may occur through flight
- Long distance spread likely through the movement of infested plants and plant products

12) Asiatic pink stem borer or Purple stem borer *Sesamia inferens*

Group Lepidoptera

Family Noctuidae

Host range

Hosts include sugarcane (*Saccharum officinarum*), grains (including oats, barley, rice, millet, finger millet (*Eleusine coracana*), pearl millet (*Pennisetum* glaucum), sorghum, maize, wheat) and grasses (including *Echinochloa frumentacea* and *Setaria italica*).

***Figure 24**. Image by Sugar Research Australia.*

Impact

- Bores into cane stems, causing damage by consuming the inner side of the plant stem. Feeding occurs within the cane stem or base. Feeding at the base often leads to wilting.

Symptoms

- Severed stems exhibiting wilting and 'dead heart'
- Symptoms of *S. inferens* is also similar to that of other stem borers

How does it spread?

- Local dispersal may occur through flight
- Long distance spread likely through the movement of infested plants and plant products

Whiteflies and Aphids

13) Sugarcane whitefly *Aleurolobus barodensis*

Group Hemiptera

Family Aleyrodidae

Host range

Hosts include sugarcane, grasses (including *Erianthus aurundinaceum* and *Miscanthus* spp.).

Impact

- Reported to reduce yield by up to 90% depending on the size of the infestation

Symptoms

- Black sooty mould that develops on honeydew

Figure 25. *Image by the ICAR National Bureau of Agricultural Insect Resources.*

How does it spread?

- Local dispersal may occur through crawling and/or flying
- Long distance spread likely through the movement of infested plant material

14) Sugarcane woolly aphid *Ceratovacuna lanigera*

Group Hemiptera

Family Aphididae

Host range

Hosts include sugarcane, grasses (including Para grass (*Brachiaria mutica*), Bermuda grass (*Cynodon dactylon*), Short-lived grass (*Eragrostis japonica*), goosegrass (*Eleusine* spp.) and *Miscanthus* spp.), Sessile joyweed (*Alternanthera sessilis),* Bush grape (*Causonis trifolia* syn. *Columella trifolia*), False daisy (*Eclipta prostrata*) and weeds (including Large crabgrass (*Digitaria sanguinalis*).

Figure 26. *Image by Sugar Research Australia.*

Impact

- In China, this aphid is reported to negatively impact sugarcane yield and quality (Li et. al, 2018).
- Potential impact on leaves and stem as this aphid sucks phloem
- This aphid excretes honeydew which enables the development of sooty mould and leads to a reduction in the plants photosynthetic capability

Symptoms

- Colonies of aphids are typically visible on the underside of sugarcane leaves as fluffy white structures (SPHD, 2021).
- Leaves with a secondary infection of sooty mould display a darker appearance (SPHD, 2021).
- For more information, refer to the National Diagnostic Protocol (NDP 43) for this pest

How does it spread?

- Local dispersal may occur through crawling and/or flying
- Long distance dispersal likely through the movement of infested plant material

Planthoppers and Leafhoppers

15) Island sugarcane planthopper *Eumetopina flavipes*

Group Hemiptera

Family Delphacidae

Host range

Hosts include sugarcane (*Saccharum officinarum*).

Impact

- Adults and larvae feed on the leaves
- This insect is a vector of Ramu Stunt virus

Figure 27. Image by the Pest and Disease Image Library (PaDIL) and Amy Carmichael, Queensland University of Technology.

Symptoms

- Plant stress including yellowing of the whorl and spindle deformation may occur under heavy pest pressure, especially in susceptible varieties
- Local discolouration may also occur caused by eggs being laid under the leaf epidermis
- If the insect transmits the causal agent of Ramu Stunt (a virus), then symptoms can include severe stunting, trashy appearance, leaf stripes and mottling and stool death

How does it spread?

- Short distance dispersal may occur through flight and aided by wind and hitchhiking on fruits and leaves
- Long distance dispersal likely through the movement of infected plant material

16) *Perkinsiella vastatrix* (as a vector of Fiji leaf gall virus)

Group Hemiptera

Family Delphacidae

Host range

Hosts include sugarcane (*Saccharum officinarum*) and grains (including sorghum and maize).

Impact

- Sap sucking insect that impacts above ground plant parts
- **This insect is a vector of Fiji leaf gall virus**

How does it spread?

- Short distance dispersal may occur through crawling and/or flying
- Long distance dispersal likely through the movement of infested plant material

Figure 28. a - Male, b - Female. Image by the University of Delaware, Planthoppers of North America.

17) *Perkinsiella vitiensis* (as a vector of Fiji leaf gall virus)

Group Hemiptera

Family Delphacidae

Host range

Hosts include sugarcane.

Impact

- Sap sucking insect that impacts above ground plant parts
- **This insect is a vector of Fiji leaf gall virus**

How does it spread?

- Local dispersal may occur through crawling and/or flying
- Long distance dispersal likely through movement of infested plant material

Figure 29. a & b - Female. Image by the University of Delaware, Planthoppers of North America.

18) Indian sugarcane leaf hopper *Pyrilla perpusilla*

Group Hemiptera

Family Lophopidae

Host range

Hosts include sugarcane (*Saccharum officinarum*), pea, grains (including barley, maize, oats, sorghum, wheat, millet, rice, chickpea, barley) and grasses (including jungle rice, Johnson grass (*Sorghum halepense*), Guinea grass).

Impact

- Nymphs and adults suck phloem sap from leaves which results in drying and withering.
- Damage affects sugar yield and quality. Losses ranging from 2-34% in sucrose content of the cane and from 3-26% in the purity of the sugar have been recorded.
- Poor growth of seed sets and difficulties in milling cane from affected plants have also been recorded
- **This insect is a potential vector of sugarcane grassy shoot phytoplasma ('*Candidatus* Phytoplasma sacchari', 16SrXI-B subgroup)**
- This insect exudes honeydew onto foliage which leads to sooty mould diseases such as *Capnodium* spp., which in turn can lead to qualitative and quantitative effects on sugar production

Figure 30. *Images by Bugwood.org.*

Symptoms

- Drying and withering of leaves
- Punctures (mainly along the main vein) of leaves. These are made by the pest during feeding and expose the plant to disease organisms.

How does it spread?

- Local dispersal may occur through crawling and/or flying
- Long distance spread likely through the movement of infested plant material

19) *Yamatotettix flavovittatus*

Group Hemiptera

Family Cicadellidae

Host range

Hosts include sugarcane (*Saccharum officinarum*).

Impact

- This insect consumes leaves
- **This insect is of importance as a vector of sugarcane white leaf disease**
- On its own in the absence of a vector, this species can cause significant damage to sugarcane by feeding on phloem sap which impedes sugar and organic compound transport in the host plant (Roddee, Wangkeeree & Hanboonsong, 2024).

Figure 31. *Y. flavovittatus. Image by National Museum Wales.*

How does it spread?

Wind is reported as the main factor influencing dispersal of this leafhopper species (Thein et. al, 2012). A recent study estimated the mean dispersal distance of *Y. flavovittatus* as 387.5 metres, hence, this species has the potential to spread locally over large distances (Thein et. al, 2012).

Bacteria

20) Leaf scald *Xanthomonas albilineans* (exotic strains- serological groups 2 or 3)

Group Bacteria

Family Xanthomonadaceae

Host range

Hosts include sugarcane.

Impact

- Partial or total chlorosis of leaves accompanied by an inward curling of the leaves (scalding)
- Stunting and potential death of stalks
- Potential death of the whole plant

***Figure 32**. Leaf scald on sugarcane leaves caused by Xanthomonas albilineans. Image by Daugrois et. al (2003).*

Symptoms

- Partial or total chlorosis of leaves accompanied by an inward curling of the leaves (scalding)
- Cream to yellow stripes starting at the tip or occasionally the margin of the leaf

Symptoms are classed into three phases: latent, chronic and acute:

- The latent phase is characterised by an absence of symptoms, which may occur under favourable plant growth conditions or in tolerant varieties.
- The chronic phase typically involves symptoms including:
    - a white pencil-line stripe (1-2 mm wide) that runs along almost the entire length of the leaf which at later stages, may be accompanied by a red pencil-line in the middle of the stripe
    - partial or total chlorosis of leaves and inward curling of leaves (scalding)
    - stalks that are stunted and which have vascular bundles, particularly at the nodes, that show reddish discolouration
    - death of the stalk
- The acute phase may see sudden plant death with few or no symptoms.

How does it spread?

- Local and regional dispersal may occur through the movement of seed, plants, soil or residues/aerosols from infested fields
- Long distance dispersal likely through movement of soil, crop residues and/or infected plants or seeds

Fungi

21) Sugarcane leaf scorch *Stagonospora sacchari*

Group Fungi

Family Phaeosphaeriaceae

Host range

Hosts include sugarcane (*Saccharum officinarum*) and grasses (including Chinese silver grass (*Miscanthus sinensis*) and Pacific Island silver grass (*M. floridulus*)).

Impact

- This fungus attacks the leaves of sugarcane, particularly during the critical growth stage 4-5 months after planting
- Overseas, has been reported to cause significant yield loss up to 30%

How does it spread?

- The microscopic spores of this fungus may be spread by wind, water, including wind-blown rain, as well as through the movement of infected plant material
- This fungus is also possibly vectored by insects

***Figure 33**. Image by Sugar Research Australia.*

Symptoms

- Small white to yellowish spots on the leaf blades
- Red or brown leaf lesions (0.5-3.0 x 0.3-1.0 mm) with a chlorotic halo which may eventually elongate along vascular bundles to form spindle-shaped streaks that combine to form larger spots (5 x 0.3 to 17 x 1.0 cm), with reddish margins and straw-coloured centres
- On older leaves, the spots do not usually elongate into streaks

22) Sugarcane root and basal stem rot *Xylaria cf warburgii/Xylaria arbuscula*

Group Fungi

Family Xylariaceae

Host range

Hosts include hybrid *Saccharum*.

Impact

This fungus is a causal agent of Root and basal stem rot (RBSR) and attacks the whole plant, including the roots and the stem and impedes the growth of ratoons (Maryono et. al, 2020). In Indonesia, it has been reported to cause serious yield losses in sugarcane plantations (Maryono et. al, 2020).

Symptoms

- Leaves that are desiccated and wilted (Maryono et. al, 2020).
- Rotting of roots and basal stem (Maryono et. al, 2020).
- The appearance of a black line in the stem (Maryono et. al, 2020).

How does it spread?

- The microscopic spores of this fungus may be spread by wind, water, soil, or through the movement of infected plant material.

***Figure 34**. X cf warburgii fruiting bodies. Image by Sugar Research Australia.*

***Figure 35.** Internal symptoms of Xylaria infection. Image by Sugar Research Australia.*

Oomycetes

23 and 24) Downy mildew *Peronosclerospora philippinensis* and *Peronosclerospora sacchari*

Group Oomycetes

Family Peronosporaceae

Host range

Hosts of *Peronosclerospora philippinensis* include sugarcane (*Saccharum officinarum*), *Saccharum* interspecific hybrids and grains (including oats, sorghum and maize).

Hosts of *Peronosclerospora sacchari* include sugarcane and grains (including maize (*Zea mays*).

Symptoms

- Leaf streaking

***Figure 36**. Downy mildew on sugarcane. Images by Sugar Research Australia.*

How does it spread?

- May be spread with the movement of infected planting material
- Wind-dispersal of spores

Phytoplasma

25) Sugarcane white leaf phytoplasma (SWLP, subgroups 16SrXI-B and 16SrXI-D)

Group 16SrXI-B and 16SrXI-D phytoplasmas

Family Acholeplasmataceae

Host range

Hosts include sugarcane (*Saccharum officinarum*).

Impact

- Severely diseased plant parts fail to set fruits, decline and do not produce millable canes
- Losses due to sugarcane white leaf (SCWL) phytoplasma vary greatly depending on the susceptibility of the clones, the weather and other environmental conditions influencing sugarcane growth

***Figure 37**. Images by Sugar Research Australia.*

Symptoms

- On leaves, cream-coloured or white stripes parallel to the midribs which may combine and extend along the entire leaf blade
- Leaf blades showing severe chlorosis
- Plants with reduced vigour
- Leaves that are narrower and smaller than those of healthy plants
- Leaves with a soft texture and are borne on slender, chlorotic shoots or tufted at the tips of slowly growing shoots
- Excessive development of proliferating tillers with shortened internodes which gives the plants a bushy, broom-like appearance

How does it spread?

- This phytoplasma is naturally transmitted by the leafhoppers *Matsumuratettix hiroglyphicus* and *Yamatotettix flavovittatus*
- This phytoplasma may also be spread via infected propagation material
- Abiotic factors are not involved in natural spread of the SCWL phytoplasma

26) Green Grassy Shoot Disease (GGSD)

Group Phytoplasma

Family Acholeplasmataceae

Host range

Hosts include *Saccharum* spp..

Symptoms

- Bending of leaflets (termed flaccidity)
- Foliar yellowing
- Marginal necrosis of older leaves

How does it spread?

- This phytoplasma may be dispersed over short distances by vectors such as *Deltocephalus vulgaris*, *Maiestas portica* and *Cofana unimaculata*
- Long distance dispersal likely through the movement of infected plants and/or vectors

***Figure 38**. Green Grassy Shoot Disease (GGSD). Images by Sugar Research Australia.*

27) Grassy shoot disease of sugarcane to '*Candidatus* Phytoplasma sacchari'

Group Phytoplasma

Family Acholeplasmataceae

Host range

Hosts include sugarcane (*Saccharum officinarum*), *Saccharum* interspecific hybrids and grains (including sorghum and maize).

Symptoms

- This disease is characterised by the production of numerous lanky tillers from the base of the affected shoots
- Affected clumps are stunted with premature proliferation of auxiliary buds
- Cane formation rarely occurs in the affected clumps and if formed, are thin with shorter internodes having aerial roots at the lower nodes
- Leaves that are pale yellow to completely chlorotic, thin and narrow
- Plants with a bushy and 'grass-like' appearance due to a reduction in the length of internodes, premature and continuous tillering
- Affected clumps have buds which are usually papery and abnormally elongated

Figure 39. Sugarcane plant suffering from sugarcane grassy shoot disease. Image by Rao et. al (2017).

How does it spread?

- This phytoplasma is primarily spread through diseased setts and cutting knives
- Short distance dispersal of this phytoplasma may also occur through vectors, specifically aphids including *Rhopalosiphum maydis*, *Melanaphis sacchari* and *Melanaphis idiosacchari*
- Long distance dispersal likely through the movement of infested plants and/or vectors

Viruses

28) Ramu stunt (SRSV) Sugarcane Ramu stunt

Group Viruses

Family -

Host range

Hosts include sugarcane (*Saccharum officinarum)* and *Saccharum* interspecific hybrids.

Impact

- This virus impacts the whole plant, with the most pronounced symptoms being stunted growth and plant death
- Root system restrictions and death are also associated with this disease
- In many cases in susceptible varieties, whole stools die giving rise to very large, or total, yield losses. Complete ratoon failure has been noted as early as first ratoon.

Symptoms

- Stunted growth and plant death
- Pale green or yellowish streak on leaves (varying in length): leaves show either a broad mosaic pattern or pale green-to-chlorotic striping. *Note: Leaf patterns vary markedly with variety and crop and are at times uncharacteristic. There is a tendency for asymmetry across the leaf blade with one half showing more definite symptoms.*
- Leaves that appear stiff, shortened and may senesce prematurely
- Shoots with a yellow appearance
- A crop with a trashy and unkempt appearance
- Abnormal proliferation of the nodes and reduced internode length

Figure 40. *Image by Sugar Research Australia.*

Figure 41*. Images by Sugar Research Australia.*

How does it spread?

- Natural transmission appears limited to that associated with insect vectors, such as the planthopper species *Eumetopina flavipes* (*E. flavipes* is not present in sugarcane-producing areas of Australia)
- Natural transmission appears limited to that associated with the insect vector
- Planting diseased vegetative material may also spread the disease (the vegetative material is sometimes referred to as sugarcane 'seed material')

29) Sugarcane streak mosaic virus (Poacevirus)

Group Viruses

Family Potyviridae

Host range

Hosts include sugarcane.

Impact

- Streaked leaves, restricted growth and reduced yield

Symptoms

- Streaks on leaves

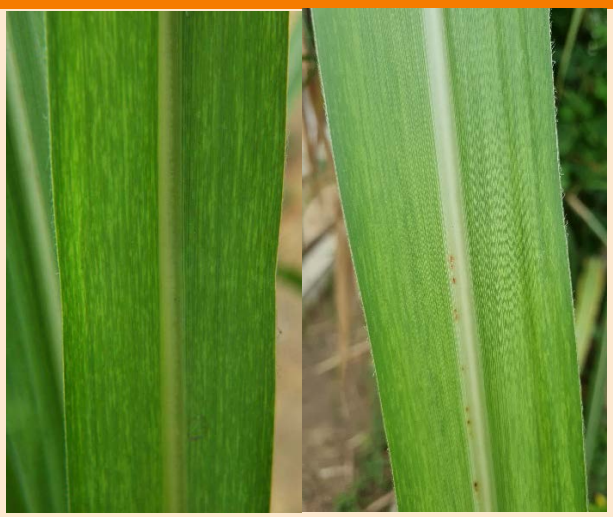


Figure 42. *Streak mosaic virus. Images by Sugar Research Australia.*

How does it spread?

- Movement and dispersal are largely attributed to aphid vectors

Regionalised Weeds

Weeds can have significant impacts on production and can be a biosecurity risk in their own right. Some weeds are limited to specific areas or districts and their management or movement may be controlled under state legislation. If you see them in new regions it is important to report them to limit their spread.

Giant sensitive plant *Mimosa diplotricha*

Description

- Shrub to sprawling vine 2-3 metres tall, with four angled stems with small prickles along the stems.
- Bright green, 10-20 cm long fern-like leaves that close up when touched and at night.
- Flowers are 12 mm wide, pale pink coloured, fluffy balls.

How does it spread?

Seeds are transported by water, vehicles, machinery, on the coats of livestock and feral animals, and contaminated soil.

Spread may also be possible through dispersal of seeds with the movement of contaminated plants (Uyi, 2020).

Where is it now?

This weed is currently restricted to Queensland, particularly in the north from Ingham to Cooktown and Mackay (Centre for Invasive Species Solutions, 2019).

Notes

- This plant has been present in far northern Queensland since the 1920s (Cullen, Julien & McFadyen, 2012)
- Reported in northern Queensland as a weed of grazing and sugarcane areas (Cullen, Julien & McFadyen, 2012).
- Individuals form dense clumps and thickets which compete with other vegetation (Ekhator et. al, 2013; Uyi, 2020). Their dense growth habit has been reported to choke sugarcane plants and harvesting machinery (Centre for Invasive Species Solutions, 2019; Cullen, Julien & McFadyen, 2012).
- Seeds can float on water and can attach themselves to animal fur and clothing (Uyi, 2020).

***Figure 43**. Clumps of Giant sensitive plants. Image by Ekhator et. al (2013).*

***Figure 44**. A seed pod of Mimosa diplotricha. Image by Bugwood.org.*

Itch grass *Rottboellia cochinchinensis*

Description

- Large 3-metre-tall grass with blue-green coloured leaves.
- Leaves and stems covered in stiff, irritating hairs.

How does it spread?

Seeds are transported by water, vehicles, machinery, on the coats of livestock and feral animals, and contaminated soil.

Where is it now?

Occurs in coastal areas from the NSW-Queensland borer to North Queensland. Also present in the Northern Territory.

Figure 45. *Leaves and stems are covered in stiff, irritating hairs. Image by SRA.*

Navua sedge *Cyperus aromaticus*

Description

- A perennial sedge that typically grows 30-70 cm tall and as tall as 2 metres (Business Queensland, 2022).
- Leaves form in drooping clusters at the base of the stem and typically measure 5 cm long and 3 cm wide (Business Queensland, 2022).
- White flowers are produced at the tips of stalks (Business Queensland, 2022).

How does it spread?

This weed may be dispersed in seed form on footwear, machinery as well as in animal faeces and mud (Business Queensland, 2022). Spread may also occur through natural growth of the rhizome system as well as through the movement of viable rhizome fragments (Business Queensland, 2022).

Where is it now?

North and southeast Queensland (Business Queensland, 2022).

Notes

- For more information, view this factsheet developed by the Queensland Government.

Figure 46*. Navua sedge with characteristic drooping leaves. Image by Queensland Government.*

Figure 47*. Image by Jim Space, Pacific Island Ecosystems at Risk (PIER), Bugwood.org.*

Olive hymenachne *Hymenachne amplexicaulis*

Description

- A perennial grass that can grow 2.5 metres tall.
- Stems are erect and contain white pith
- Leaf blades are 10-45 cm long and up to 3 cm wide. The base of the leaf curls around the stem.
- Flowers are spike-like and 20-40 cm long.
- Listed as a weed of national significance.

How does it spread?

- Seeds are spread by water movement and aquatic birds (Business Queensland, 2021).

Where is it now?

It has been found from Cape York in north Queensland to Casino in NSW as well as in the top end of the Northern Territory (Business Queensland, 2021).

Notes

- Grows from seed and broken stem fragments and is capable of growing in permanent wetlands.
- For more information, view this factsheet developed by the Queensland Government.

***Figure 48**. Top: Close up of flower spike. Bottom: Plants can grow in permanent wetlands. Images by NQ Dry Tropics.*

Red witchweed *Striga asiatica*

Description

- A parasitic weed that grows attached to the roots of a host plant.
- It grows 10-40 cm tall, with leaves arranged in opposite pairs along the stem.
- The flowers are usually red, but can be white, yellow or pink.

How does it spread?

- The seeds are dust like and can crop into the soil easily, enabling it to spread.
- Wind dispersal, soil movement, or via animals and people.

Where is it now?

A single population occurs near Mackay in Queensland (Business Queensland, 2021b). An eradication process is ongoing in the Mackay region.

***Figure 49**. Image by CANEGROWERS.*

Notes

- Prohibited invasive plant under the *Biosecurity Act 2014*
- Illegal to keep, cultivate, transport or sell in Queensland
- For more information, view this factsheet developed by the Queensland Government.

Siam weed *Chromolaena odorata*

Description

- A dense tangling bush that can grow up to 2-3 metres tall. The root system is fibrous and shallow in most soils.
- Leaves are green, hairy, soft and triangular.
- Leaves emit an odour when crushed (Business Queensland, 2021c).
- The plant produces masses of pale lilac flowers from May to July and again in September to October.

How does it spread?

- Windborne seeds.
- Carried on vehicles, clothing, footwear and animals.
- It may also be spread through waterways (Business Queensland, 2021c).

Notes

- First discovered in Australia in 1994 in Bingil Bay in North Queensland (Centre for Invasive Species Solutions, 2020).
- A plant may live for up to 10 years (Centre for Invasive Species Solutions, 2020).
- For more information, view this factsheet developed by the Queensland Government.

***Figure 50**. Flower of Siam weed. Image by NQ Dry Tropics.*

Where is it now?

North Queensland, in particular the areas of Townsville-Thuringowa, Mossman and Mt Garnet (Centre for Invasive Species Solutions, 2020).

Sicklepod or Coffeeweed *Senna obtusifolia*

Description

- Woody shrubs to 2 metres in height.
- Small yellow flowers
- Leaves are made up of 2-3 pairs of leaflets, each leaflet is around 4 cm long.
- Long thin sickle shaped seed pods up to 18 cm long.

How does it spread?

- Seeds spread with water, harvested sugarcane or mud on machinery.
- Seeds can also be spread by livestock and feral animals.

Where is it now?

This weed is found in Queensland around Mackay, Ingham and parts of the Atherton Tablelands (Business Queensland, 2021d). It is also found in Darwin in the Northern Territory and surrounds (Centre for Invasive Species Solutions, 2019b; City of Darwin, n.d.).

Notes

- For more information, view this factsheet developed by the Queensland Government.

***Figure 51**. Mature plant with features such as long seed pods and large leaves visible. Image by Bugwood.org.*

***Figure 52**. Flower. Image by Bugwood.org.*

Singapore daisy *Sphagneticola trilobata*

Description

- Ground cover with glossy green leaves.
- Yellow to orange-yellow daisy flowers 2 cm in size.
- Flowers all year.

How does it spread?

- It is spread primarily by cuttings that are created when slashing and pruning (Business Queensland, 2021d).

Where is it now?

Found in southeast Queensland and coastal parts of northern and Central Queensland (Business Queensland, 2021e).

***Figure 53**. Singapore daisies form dense colonies. Image by Bugwood.org.*

Notes

- The plant is capable of regrowth from cuttings.
- For more information, view this factsheet developed by the Queensland Government.

Wild sorghum or Rhodesian Sudan grass *Sorghum arundinaceum*

Description

- Annual or perennial plant that grows to 1.5-2.5 metres tall (Martins et. al, 2016).
- Leaf sheaths are smooth and glabrous (Simon, 2010).
- Culms are erect (Simon, 2010).
- Lacks rhizomes (Jordan et. al, 2004).

***Figure 55.** Inflorescence. Image by D. Sharp, Queensland Herbarium.*

***Figure 54**. Image by D. Sharp, Queensland Herbarium.*

How does it spread?

Based on the dispersal mechanisms of closely related species such as *Sorghum bicolor* subsp. *drumondii,* it is likely *S. arundinaceum* could also spread through the movement of seed aided by wind, water and animals (Australian Government, 2017).

Where is it now?

This species has been reported as a weed in coastal areas of Queensland and northern New South Wales (Simon, 2010).

Notes

- Also referred to as *Sorghum bicolor* subsp. *arundinaceum* (Australian Government, 2017).
- Parents of the hybrid weed known as Silk sorghum or Silk forage sorghum include *S. arundinaceum* and 'Krish' (a hybrid of Johnson grass (*S. halepense*) and *S. roxburghii*) (Australian Government, 2017; O'Sullivan, 2013).

Spotted an unusual pest or disease on your property?

Step 1: Contact your local Productivity Services agronomist or Sugar Research Australia

Productivity Services are regional organisations that provide clean seed, agronomy and pest and disease management advice and extension services to growers. Productivity Services offer support to sugarcane producers in various Production Districts. It is a good idea to consult your local Productivity Service when you encounter a pest or disease on your property as they are well placed to guide an initial investigation and may recognise in the first instance the identity of the pest or pathogen including whether it may be exotic to your region.

Sugar Research Australia (SRA) is the Research and Development organisation representing the Australian sugarcane industry and offers pathology and entomology services, including laboratory testing for a range of pests and pathogens.

How do I find my local Productivity Service?

A list of Productivity Services can be found in the **Useful Contacts** section at the back of this guide.

How do I submit an enquiry to Sugar Research Australia?

Individuals can submit an enquiry by filling out the online contact form available on the Sugar Research Australia (SRA) website https://sugarresearch.com.au/contact/.

Step 2: Collect and submit a sample

As a grower, in the first instance contact your local Productivity Services agronomist or Sugar Research Australia District Manager as they may be able to conduct sampling on your behalf.

How are samples collected?

Sampling techniques and requirements may vary depending on the pest or pathogen and could involve the collection of soil samples or other plant material such as stalks.

Growers should contact the Sugar Research Australia District Manager or Productivity Services agronomist who can advise on an appropriate sampling method.

How are samples submitted?

You may liaise with your local Productivity Services agronomist to submit a sample or contact SRA directly to submit a sample yourself. SRA staff will then ensure the sample is directed to the appropriate facility for further testing.

What happens once a sample has been submitted?

Molecular tests and assays are routinely utilised to screen sugarcane plant material for the presence of pathogens such as viruses.

Moving sample material

As outlined in the Queensland *Biosecurity Regulation 2016*, a sample may be moved into the State, or into or from a biosecurity zone if it will be directed to an approved facility for testing and is quarantine secured. Where required, a sample may also be directed from a biosecurity zone out of the state provided that the sample is being directed for testing and is quarantine secured.

To be deemed *quarantine secured* under the Queensland *Biosecurity Regulation 2016*, a sample must be sealed within three layers of packaging (**Figure 56**) to mitigate the risk of escape of the sample or any biosecurity matter.

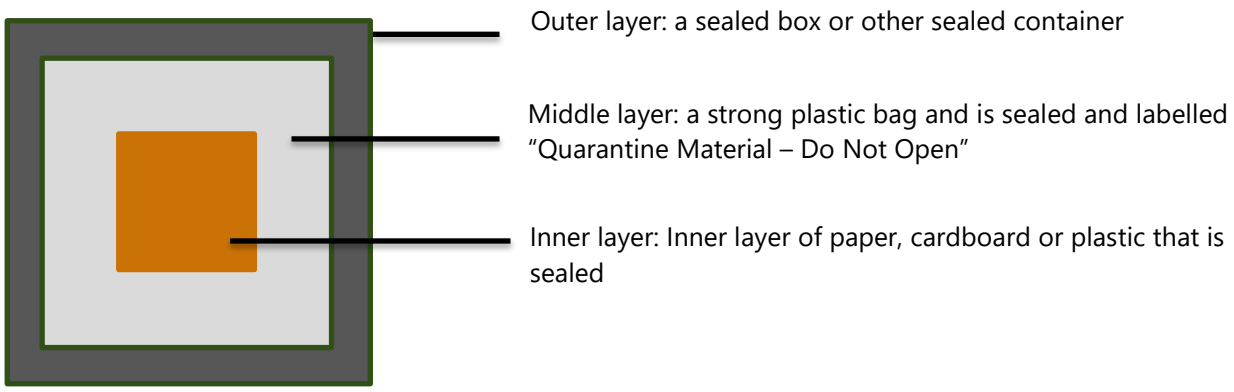


***Figure 56**. Packaging layers required to be considered quarantine secured under the Queensland Biosecurity Regulation 2016.*

Step 3: Sample Receipt & Diagnostics

SRA provides a range of diagnostic services to the Australian sugar industry which are conducted across its various laboratories located within Australia. In some instances, testing may be requested through submission of laboratory assay request forms which are available on the SRA website.

Several facilities provide diagnostic services to the Australian Sugarcane industry, some of which are listed in **Table 2**.

***Table 2**. Several diagnostic facilities exist in Australia that service the Australian Sugarcane industry and are equipped to process sugarcane samples and analyse them for pests and diseases.*

Innovative Research and Industry Services (IRIS) Laboratories (Acacia Ridge)

Location	17 Iris Place, Acacia Ridge, Queensland, Australia
Operator	Sugar Research Australia
Contact	RSDLab@sugarresearch.com.au
Services	Multiple laboratories form part of this centre. Services include testing for diseases such as Ratoon Stunting Disease (RSD), sugarcane DNA testing, sugarcane nutrient analysis as well as soil and water testing.
More information	https://sugarresearch.com.au/location/acacia-ridge/ https://sugarresearch.com.au/iris-laboratories-ready-to-flower-for-the-sugarcane-industry/

Tully Soil Laboratory

Location	216 Dallachy Road, Silky Oak, QLD, 4854
Operator	Sugar Research Australia
Contact	Phone: (07) 4056 4500 https://sugarresearch.com.au/contact/
Services	This facility performs testing for *Pachymetra*.
More information	https://sugarresearch.com.au/location/tully/

Woodford Research and Quarantine Station

Location	90 Old Cover Road, Woodford, Queensland, 4514, Australia
Operator	Sugar Research Australia
Contact	Phone: (07) 5434 5900 Online form: https://sugarresearch.com.au/location/woodford/
Services	This facility handles nematode samples.
More information	https://sugarresearch.com.au/location/woodford/

Figure 57. Spotted something unusual?

Case Study: *Pachymetra* root rot

What is it?

Pachymetra root rot caused by the oomycete (water mould) *Pachymetra chaunorhiza,* occurs in all Australian sugarcane growing regions. This pathogen attacks the sugarcane plants primary roots leading to crop damage including stunted cane and poorly anchored plants that can fall to the ground during strong winds or be pulled from the soil during harvest (SRA, 2025c). These symptoms can lead to crop losses of up to 40% in some varieties. As parts of its lifecycle, the pathogen produces oospores that can last in the soil for more than five years (Bhuiyan et. al, 2016). Due to its prevalence in Australian sugarcane, SRA provides diagnostic testing for this pathogen.

Figure 58. *Pachymetra root rot. Image by Sugar Research Australia.*

Figure 60. *Pachymetra infested sugarcane stool (i.e. underground stubble). Image by Sugar Research Australia.*

Figure 59*. Pachymetra oospore. Image by Sugar Research Australia.*

How is it managed?

Management of this disease is based on planting resistant varieties and good crop hygiene.

How is it detected?

Pachymetra root rot can be detected by counting of spores from soil samples. This assay can also determine the likely severity of the disease in the field. When sampling from standing crops, soil samples are collected within the cane row from between 0-25 cm depth in the soil profile (SRA, 2025d). SRA recommends that soil samples be taken through the planting line (in the row) using a soil auger or corer (SRA, n.d.).

Where can I find more information?

SRA has developed a sampling protocol for *Pachymetra* root rot which provides specific instructions on how to best collect and prepare samples for diagnosis.

Growers Encouraged to Get in Early with *Pachymetra* Sampling
Sugar Research Australia
https://elibrary.sugarresearch.com.au/server/api/core/bitstreams/d69b1c28-df40-4048-b115-09e7b11d0a70/content

Pachymetra root rot
Sugar Research Australia
https://sugarresearch.com.au/wp-content/uploads/2017/02/Pachymetra-root-rot-IS13005.pdf

Case Study: Ratoon Stunting Disease (RSD)

What is it?

Ratoon Stunting Disease (RSD) is a bacterial disease of sugarcane that damages the host plant's vascular system and its ability transport water which leads to stunting and yield losses in the crop.

***Figure 61**. Healthy sugarcane plants (left) versus stunted plants infected with RSD (right). Image by Sugar Research Australia.*

How is it managed?

Growers are encouraged to use disease-free planting material (clean seed cane) and to adhere to good hygiene practices, especially cleaning of machinery and equipment such as cane knives and harvesters, between uses to reduce the risk of disease spread (SRA, 2025f).

How is it detected?

Sampling for RSD testing involves collection of xylem extract or leaf sheath biopsies from multiple sugarcane stalks growing in the field. Samples are then subject to a highly sensitive laboratory test to detect the presence of DNA belonging to the bacterium, *Leifsonia xyli* subsp. *xyli* (*Lxx*) which lives in the xylem of the host plant and is responsible for causing RSD (SRA, 2021; SRA, 2024).

When sampling in the field, SRA recommends sampling 16 to 20 stalks per sample and targeting as much of the block as possible: including corners, sides and internal rows and infected areas, to maximise the probability of detecting RSD (SRA, 2024; SRA, 2025f).

***Figure 62**. A sample collection tube. Image by SRA.*

Did you know? SRA's RSD laboratory tests between 8-10,000 samples per year for the Australian sugarcane industry.

Where can I find more information?

For more information, contact your local Productivity Services or SRA at RSDLab@sugarresearch.com.au.

SRA has also developed a sampling protocol for RSD which provides specific instructions on how to best collect and prepare samples for diagnosis.

Ratoon Stunting Disease (RSD)
Sugar Research Australia
https://sugarresearch.com.au/diseases/ratoon-stunting-disease/

Case Study: Nematodes

What are they?

Nematodes are small, unsegmented, round worms that occupy a range of habitats such as water, soil and plant roots (Briar, Wichman & Reddy, 2016; Gaugler, 1997; SRA, 2022). Nematodes may follow one of two lifestyles: free-living or parasitic and are classified accordingly as Free-Living Nematodes (FLN) or Plant Parasitic Nematodes (PPN)(Gaugler, 1997; SRA, 2022). Whilst FLNs can play a beneficial role and are recognised for contributing to soil nutrient cycling, PPNs may feed directly on plant roots causing harm to the host plant in the form of galls or lesions on roots, stunting, yellowing and/or wilting and indirectly through introduction of secondary pathogens such as viruses (Briar, Wichman & Reddy, 2016; Rowe & Powelson, 2002; Yadav, Patil & Kanwar, 2018). Examples of PPNs that damage sugarcane include root lesion nematodes (e.g. *Pratylenchus zeae*), root knot nematodes (*Meloidogyne* spp.), dagger nematodes and spiral nematodes (SRA, 2014). Roots of sugarcane plants infested by root knot nematodes may swell and develop galls, particularly at their tips (SRA, 2014).

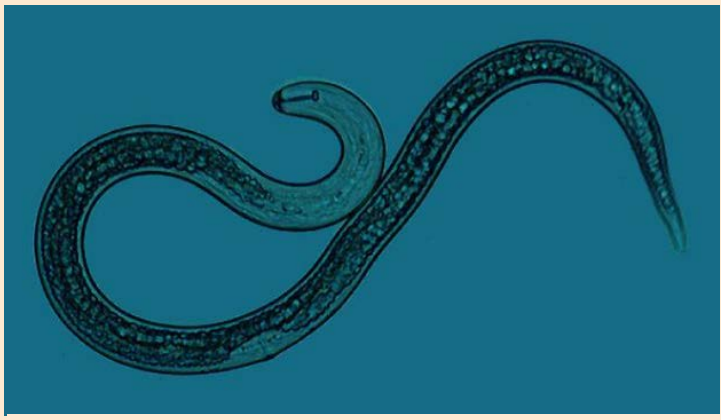


***Figure 64**. Pratylenchus spp. Image by Jonathan D. Eisenback, Virginia Polytechnic Institute and State University, Bugwood.org.*

***Figure 63**. Left: Root-knot nematode damage, Right: Lesion nematode damage. Images by SRA.*

How are they managed?

Management strategies for root knot nematodes (RKNs) can include crop rotation (particularly with legumes such as soybean and peanut), minimum tillage and application of nematicides (Briar, Wichman & Reddy, 2016; SRA, 2014).

Resistant cane varieties are currently not available in Australia, however, ongoing research conducted by SRA is investigating genes conferring resistance to lesion nematodes (SRA, 2022).

As a preventative measure, it is also important to adhere to good farm biosecurity practices to prevent the risk of spreading nematodes elsewhere on contaminated machinery and plant material (Briar, Wichman & Reddy, 2016).

Effective management is also enhanced by knowledge of what nematode species are present on your property. As a grower, this can be achieved by contacting your local Productivity Services who can direct samples to Sugar Research Australia for laboratory analysis and diagnostics.

Did you know? According to SRA, planting soybean and peanut crops as part of your crop rotation can decrease populations of PPNs by as much as 80-90%! (SRA, 2014).

Case Study: Nematodes (continued)

How are they detected?

Testing for nematodes present in the soil can be achieved through the collection of soil samples. SRA recommends collection of soil samples with the use of a soil auger or corer from areas likely to have active roots, such as along the edge of the crop row (SRA, n.d.). SRA also recommends sampling moist soil two to three days after a rainfall event (SRA, n.d.). As per SRA's nematode sampling protocol, to ensure sufficient representation of your target property area, multiple soil cores of the same soil type are collected and combined with gentle mixing to produce a composite from which a smaller subsample is collected and dispatched to SRA's Tully laboratory for testing; the latter which may include counting of plant parasitic nematodes under a microscope (SRA, n.d.; SRA, 2014; Walker, n.d.).

Where can I find more information?

For more information, contact your local Productivity Services or SRA

SRA has also developed a sampling protocol for nematodes which provides specific instructions on how to best collect and prepare samples for diagnosis.

Nematodes in Sugarcane
Sugar Research Australia
https://sugarresearch.com.au/wp-content/uploads/2025/04/Nematodes-in-sugarcane.pdf

Managing nematodes in sugarcane production: Burdekin
Sugar Research Australia
https://sugarresearch.com.au/wp-content/uploads/2017/02/Managing-Nematodes-in-Sugarcane-Production-Burdekin-IS14027.pdf

Reporting a Suspect Pest

Pests and diseases can have a serious impact on your business, industry and community. By playing your part and reporting anything unusual, you can help reduce the chance any new pest or disease is here to stay. Additionally, it is also important to do so as part of your general obligation to act to prevent the introduction and spread of pests, diseases and contaminants.

As a grower, if you notice unusual pests or diseases on your property, contact your local Productivity Services agronomist or Sugar Research Australia. They can provide you with initial diagnostic advice about what you have seen and can work with you to report anything unusual through appropriate channels.

Whether it is an insect, mite, snail or disease, it is important that unusual pests or diseases are reported in a timely manner. The earlier a report is made, the more likely it is that a pest may be controlled or eradicated.

If you are unsure what something is, contact your local Productivity Services, Sugar Research Australia or the **Exotic Plant Pest Hotline on 1800 084 881**.

How do I make a report?

In Australia, any unusual plant pest should be reported as soon as possible to the relevant State or Territory government agency through the **Exotic Plant Pest Hotline on 1800 084 881**.

Calls to the Exotic Plant Pest Hotline will be forwarded to an experienced person in the relevant State or Territory government agency, who will ask some questions about what you have seen and may arrange to collect a sample.

what was seen (describe the pest or send a photo) and when was it was first noticed

where it was found and what it was on

how many pests are present/**how infected is the crop**

how widely distributed it is

Do not send samples without first speaking to someone from the relevant State or Territory government agency, who can discuss the correct type of sample, its packaging, handling and appropriate laboratory for diagnosis. They may say it is nothing new and refer you back to your Production Service to work out the best management option.

Why should I report an unusual pest?

You will have access to support, knowledge and advice from your relevant State or Territory government agency and your industry organisations. This is the best way to:

- get the facts about the pest,
- take the right action to limit spread on your property and neighbouring properties,
- either eradicate or approximately manage the pest, and
- help to keep local businesses and the community profitable.

If you have found a suspected exotic plant pest, the following general precautions should be taken immediately to contain the pest and protect other parts of your farm:

- mark the location of the pest detection and limit access to the area for both people and equipment,
- wash hands, clothes and boots that have been in contact with affected plant material or growing media, and restrict operations in the area while waiting for the identification of the suspected exotic pest.

General Biosecurity Obligation

In Queensland, under the *Biosecurity Act 2014*, everyone has a general biosecurity obligation (GBO) to ensure they do not spread a pest, disease or a contaminant.

Likewise, in New South Wales, under the *Biosecurity Act 2015*, everyone has a general obligation to act to prevent the introduction and spread of pests, diseases, weeds and contaminants. The *Biosecurity Act 2015* relates to the prevention, elimination, minimisation and management of biosecurity risks.

As part of fulfilling your general obligation to prevent or minimise biosecurity risks, the Queensland government recommends to:

- 'Come clean, go clean' meaning you should ensure your shoes, clothing, vehicles and equipment are clean before you enter and leave agricultural properties, park or forests
- Check for and follow biosecurity zones and other movement restrictions and local requirements before moving certain plant material, soil and related equipment
- Additionally, you should also be aware of any biosecurity management activities or plans in place before entering a property
- Be informed about pests and diseases, including specific risks to your area

More information

Queensland *Biosecurity Act 2014*
Queensland Government
https://www.legislation.qld.gov.au/view/html/inforce/current/act-2014-007

New South Wales *Biosecurity Act 2015*
New South Wales Government
https://www.dpi.nsw.gov.au/dpi/biosecurity/managing-biosecurity/legislation/biosecurity-act-2015

General biosecurity obligation (Queensland)
Queensland Government
https://www.dpi.qld.gov.au/business-priorities/biosecurity/policy-legislation-regulation/biosecurity-act-2014/general-biosecurity-obligation

General obligation (New South Wales)
New South Wales Government
https://www.dpi.nsw.gov.au/dpi/biosecurity/managing-biosecurity/general-biosecurity-duty

What happens if you spot something new?

If a cane pest or disease you reported is of concern, several activities will be carried out by the State or Territory biosecurity agency both on and off your property to better understand the situation.

The State or Territory biosecurity agency will:

- in consultation with the property owner, conduct trace forward and trace back to determine where the pest came from and where it may have travelled to. Having accurate records of your farm inputs, machinery movements and produce movements help speed this process up.
- engage with their jurisdiction counterparts and peak plant industry bodies, to keep them updated and seek their advice.

It may take time to correctly diagnose the pest or disease and determine whether control actions are needed, and this may cause some uncertainty, but the biosecurity agency will work with you to minimise disruption. Throughout these investigations (and the duration of a response) and at all times, your personal information, including your address, will remain confidential.

What happens on your property if an Emergency Plant Pest is detected?

As more information is known and diagnostics confirm if the pest is an **Emergency Plant Pest**, (refer to **What is an Emergency Plant Pest?** for a definition of an Emergency Plant Pest) measures may be put in place to reduce the risk of the pest or disease spreading. These could include:

- restriction of operations in the immediately impacted area
- restricted movement of people, vehicles and machinery on and off the property
- restricted movement of all host material on and off the property
- farm hygiene measures including footbaths and handwash etc and decontaminating vehicles and machinery entering or leaving the property
- treatment and control measures to eradicate the pest/disease
- guidance on the activities that are still permitted on your property until the pest is eradicated.

What happens beyond your property gate?

Pests or diseases can vary greatly, including how far and quickly they can spread. Depending on the Emergency Plant Pest, areas surrounding your property may also be subject to quarantine restrictions. Surveillance may be conducted across neighbouring properties and businesses that you have sent goods to or received goods from to help work out how far the pest or disease has spread.

Throughout the process, the State or Territory biosecurity agency will keep you informed of what actions you need to take and what may be happening on your property. As a signatory to the Emergency Plant Pest Response Deed (EPPRD)(defined in **Preparing for Emergency Responses**), CANEGROWERS will also support you by providing answers to questions and addressing any concerns you have about how emergency response actions are being conducted.

The State or Territory biosecurity agency together with the Australian, State and Territory governments, Affected Industry Parties (if signatories to the EPPRD) and Plant Health Australia, will meet regularly to progress the response. If you are an affected sugar cane grower, you will be represented in this process by CANEGROWERS. If you have experienced losses due to a direct action ordered by the government agency managing the response (Lead Agency), CANEGROWERS may also work with you and the Lead Agency to determine any Owner Reimbursement Costs you may be eligible for.

Through every stage of a response, it is important to keep up to date with the latest information as the situation can change quickly. Up to date information is disseminated by the Lead Agency and CANEGROWERS based on nationally agreed talking points and can also be found on the outbreak.gov.au website.

What happens next?

Once the size and nature of the incursion is determined, it is determined whether a national eradication program might be undertaken.

For more information on what happens during an incursion, refer to **Preparing for Emergency Responses**.

The aim of an eradication is always to get you and your industry back to business as quickly as possible and if relevant, return proof of freedom status to restore any markets that have been closed due to the incursion.

Want to learn more?

Queensland Biosecurity Manual *Version 21.0 (October 2023)*
Queensland Government
https://www.daf.qld.gov.au/__data/assets/pdf_file/0004/379138/qld-biosecurity-manual.pdf

Sugarcane Biosecurity in Australia

What is Biosecurity?

Biosecurity is the management of risks to the economy, the environment and the community, from new pests entering, establishing and spreading in your area. Biosecurity is a shared responsibility and a national priority. Biosecurity involves government actions at the border, pre-border work in other countries, regional and interstate restrictions, emergency responses for new pests as well as measures on-farm.

In Australia, biosecurity involves three layers of protection:

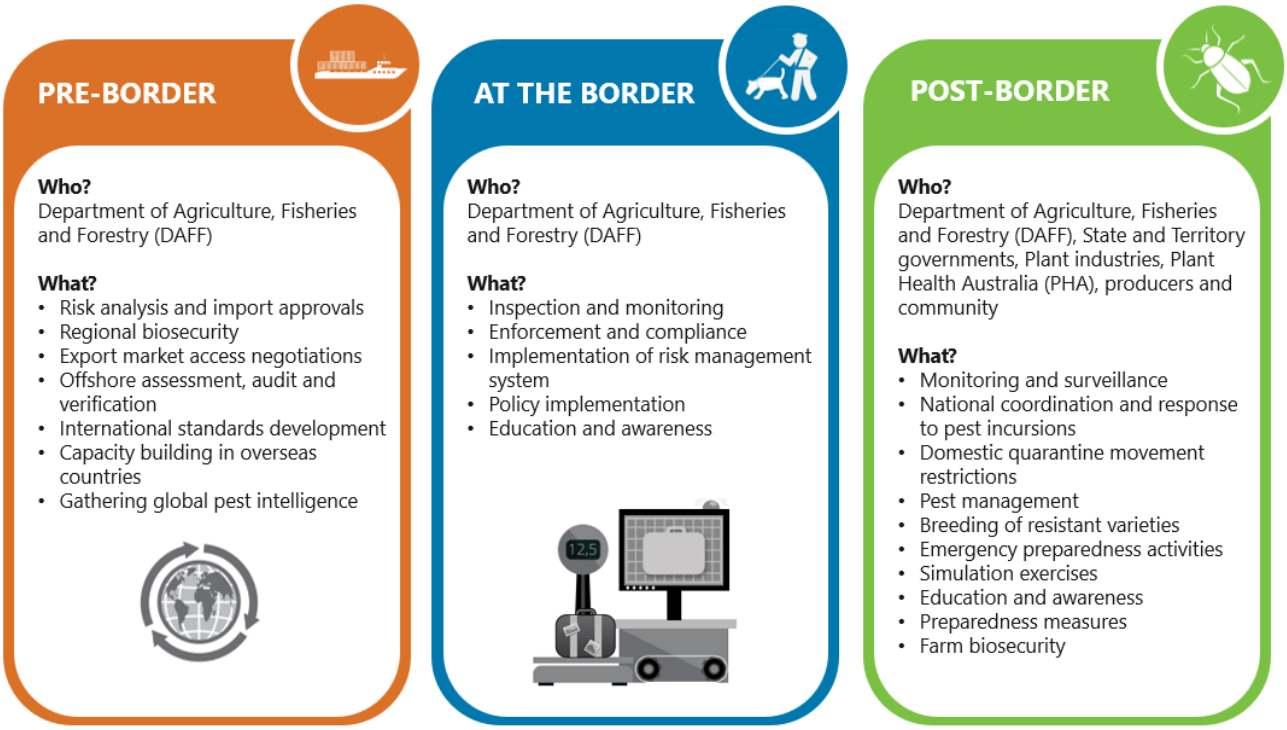


Figure 65. The biosecurity continuum.

Pests and diseases do not respect farm boundaries or state borders

Due to its geographic isolation Australia has been protected from many pests that growers have to contend with overseas.

Biosecurity is crucial to maintain this favourable pest status, safeguarding the future profitability and sustainability of Australia's plant industries.

General Biosecurity Obligation

In Queensland, under the *Biosecurity Act 2014*, everyone has a general biosecurity obligation (GBO) to ensure they do not spread a pest, disease or a contaminant.

Likewise, in New South Wales, under the *Biosecurity Act 2015*, everyone has a general obligation to act to prevent the introduction and spread of pests, diseases, weeds and contaminants. The *Biosecurity Act 2015* relates to the prevention, elimination, minimisation and management of biosecurity risks.

As part of fulfilling your general obligation to prevent or minimise biosecurity risks, the Queensland government recommends to:

- 'Come clean, go clean' meaning you should ensure your shoes, clothing, vehicles and equipment are clean before you enter and leave agricultural properties, park or forests
- Check for and follow biosecurity zones and other movement restrictions and local requirements before moving certain plant material, soil and related equipment
- Additionally, you should also be aware of any biosecurity management activities or plans in place before entering a property
- Be informed about pests and diseases, including specific risks to your area

More information

Queensland *Biosecurity Act 2014*
Queensland Government
https://www.legislation.qld.gov.au/view/html/inforce/current/act-2014-007

New South Wales *Biosecurity Act 2015*
New South Wales Government
https://www.dpi.nsw.gov.au/dpi/biosecurity/managing-biosecurity/legislation/biosecurity-act-2015

General biosecurity obligation (Queensland)
Queensland Government
https://www.dpi.qld.gov.au/business-priorities/biosecurity/policy-legislation-regulation/biosecurity-act-2014/general-biosecurity-obligation

General obligation (New South Wales)
New South Wales Government
https://www.dpi.nsw.gov.au/dpi/biosecurity/managing-biosecurity/general-biosecurity-duty

Sugarcane Biosecurity Zones (SBZs)

Sugarcane Biosecurity Zones (SBZs) are in place throughout Queensland to control the movement of machinery and sugarcane plant material. There are currently six SBZs (Figure 66, Table 3).

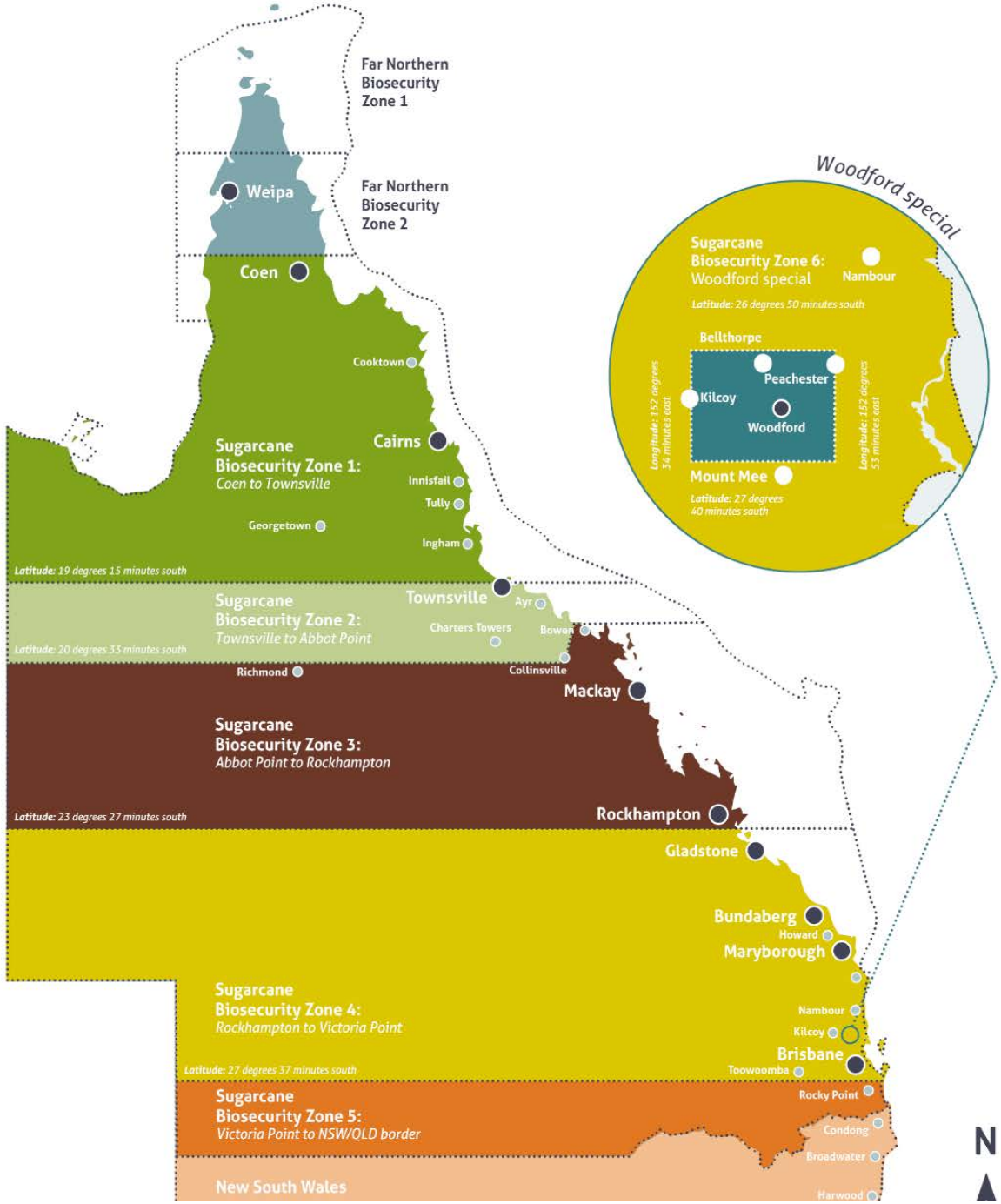


Figure 66. *Sugarcane Biosecurity Zones in Australia.*

Sugarcane Biosecurity Zones
Sugar Research Australia
https://sugarresearch.com.au/wp-content/uploads/2024/10/SRA-Sugarcane-biosecurity-and-pests-diseases-and-weeds.pdf

Table 3. Sugarcane Biosecurity Zones.

Number	Description
1	Coen to Townsville
2	Townsville to Abbot Point
3	Abbot Point to Rockhampton
4	Rockhampton to Victoria Point
5	Victoria Point to NSW/QLD border
6	Woodford Special

***Figure 67**. Image by CANEGROWERS.*

Why do we need biosecurity zones?

Biosecurity zones exist to prevent the spread of pests and diseases between areas, for example, SBZs focus on minimising the spread of pests and diseases of sugarcane. Other types of biosecurity zones also exist, such as the Far northern biosecurity zones in northern Queensland.

As per the Queensland *Biosecurity Act 2014*, biosecurity zones include the "whole or part of the State" and are designed for the purposes of "managing, reducing or eradicating regulated biosecurity matter over an extended period of time or indefinitely" (State of Queensland, 2024).

Case Study: The importance of Sugarcane Biosecurity Zones in the defence against Sugarcane Mosaic Virus (Strain A)

Sugarcane mosaic, a devastating disease of Australian sugarcane, is caused by strain A of the sugarcane mosaic virus.[34] Symptoms of this disease include leaves that appear mottled with light green to yellow and dark green patches. The virus, which is considered established in Australia, is transmitted by aphids.[42]

This virus is currently restricted to the Southern region of Queensland, particularly the Bundaberg/Childers district (represented as part of SBZ4) and in Rocky Point (SBZ5) (**Figure 66**).[34] Conversely, this means the virus is absent from other SBZs. Enforcement of SBZs and quarantine measures is therefore essential in preventing the spread of this virus to other sugarcane producing areas in Australia.

This disease is currently managed by using disease-free seed and planting resistant sugarcane varieties.[34]

***Figure 68.** Image by Sugar Research Australia.*

Far Northern Biosecurity Zones

In addition to Sugarcane Biosecurity Zones, two additional Biosecurity Zones exist in Queensland represented by the Far Northern biosecurity zone 1 (FNBZ 1) and Far Northern biosecurity zone 2 (FNBZ 2) (Figure 69).

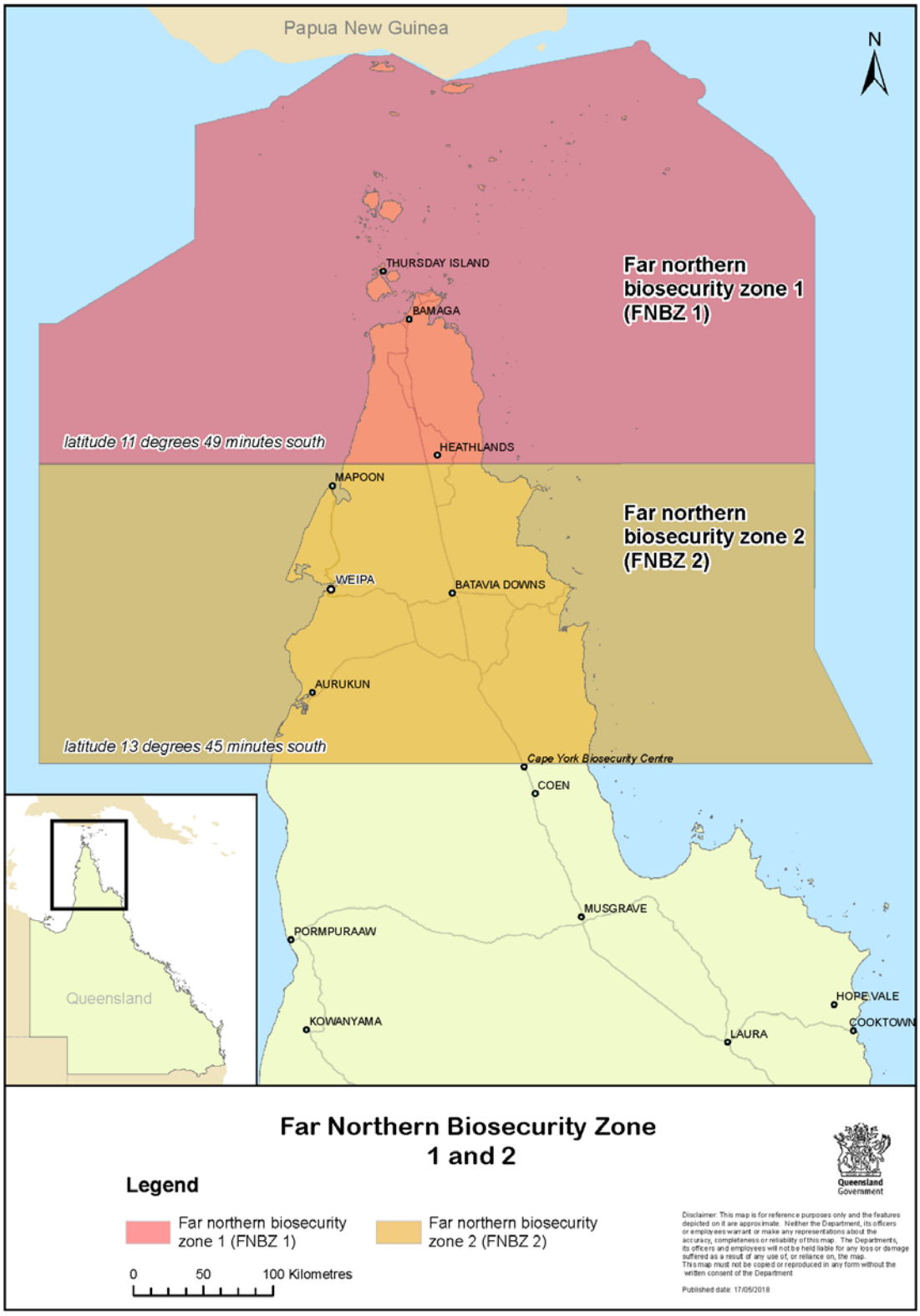


***Figure 69**. Queensland Far Northern Biosecurity Zones. Image by the Queensland Government.*

How are biosecurity zones defined and enforced?

Queensland's *Biosecurity Act 2014* and *Biosecurity Regulation 2016* control the movement of sugarcane and sugarcane related machinery between Queensland's sugarcane biosecurity zones, and controls pests and diseases within these zones.

As per the Queensland *Biosecurity Act 2014*, biosecurity zones may be defined using references including but not limited to coordinates determined using global positioning systems, geographical features such as roads and rivers, as well as local government and electoral boundaries. In the case of SBZs, zones are demarcated by defined coordinates (latitude and longitude) (**Figure 66**).

It is illegal to move Sugarcane Plant Material and Machinery between Biosecurity Zones without Government approval

Plant material or machinery that has been in contact with a sugarcane plant, or soil which has recently grown sugarcane **must have a Plant Health Assurance Certificate (PHAC) to move between sugarcane biosecurity zones**.

It is a legal requirement that individuals comply with biosecurity restrictions when moving plant material, soil and equipment to prevent the spread of pests and diseases[1].

Restrictions also apply to the movement of sugarcane out of the Far Northern biosecurity zones.

It is also important to comply with movement restrictions regarding pests and diseases such as Red Imported Fire Ant (RIFA) and Electric Ant. As per the Queensland *Biosecurity Act 2014*, individuals have a General Biosecurity Obligation (GBO) to take all reasonable steps to prevent the spread of fire ants. Fire ant biosecurity zones are also in place, more information on which is available on the National Fire Ant Eradication Program website (https://www.fireants.org.au/stop).

More information

National Fire Ant Eradication Program
https://www.fireants.org.au/stop

Fire ants
Queensland Government
https://www.dpi.qld.gov.au/business-priorities/biosecurity/invasive-plants-animals/ants/fire-ants

Fire ants
New South Wales Government
https://www.dpi.nsw.gov.au/dpi/bfs/insect-pests/rifa

[1] https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/biosecurity/plants/moving/restrictions

Movement of Plant Material

To move sugarcane plants between sugarcane biosecurity zones, contact **Biosecurity Queensland** (13 25 23).

Sugarcane plant material includes:

- Stalks
- Billets
- Leaves
- Tissue culture plantlets
- Potted plants

Note: Sugarcane mulch is currently exempt from movement restrictions applied to sugarcane plant material.

Movement of Machinery

To move a machine between sugarcane biosecurity zones, contact your nearest Productivity Service.

In most areas, some Productivity Service staff have been appointed authorised inspection persons by the Queensland Department of Primary Industries for machinery inspections.

More information

Queensland Biosecurity Manual *Version 21.0 (October 2023)*
Queensland Government
https://www.daf.qld.gov.au/__data/assets/pdf_file/0004/379138/qld-biosecurity-manual.pdf

Queensland *Biosecurity Act 2014*
Queensland Government
https://www.legislation.qld.gov.au/view/pdf/inforce/current/act-2014-007

Moving sugar cane material

As outlined in the Queensland *Biosecurity Regulation 2016*, movement restrictions apply to *sugar cane pest carrier* material which is defined as:

- a vegetative part of a sugar cane plant or
- soil or other growing mediums in which a sugar cane plant has been grown or
- an appliance that has come into contact with a vegetative part of a sugarcane plant or soil

Under the Queensland *Biosecurity Regulation 2016*, a person must not move *sugar cane pest carrier* material:

- from a place within the State into sugar cane biosecurity zone 1 or 5 or
- from any of sugar cane biosecurity zones 1 to 6 to a place outside the biosecurity zone or
- from a place outside of the State into any of sugar cane biosecurity zones 1 to 6

A person may, however, move *sugar cane pest carrier* material in the following circumstances:

- under a biosecurity authorisation
- for material that is a sugar cane plantlet (i.e. a young or small sugar cane plant) grown under a scheme for the clean planting of sugar cane that is stated in the biosecurity manual or
- the person gets an acceptable biosecurity certificate that states the material meets the risk minimization requirements for the material, before moving the material and
- ensures under section 46, that, until the move is completed, the material is dealt with in accordance with risk minimisation requirements

Moving sample material

As outlined in the Queensland *Biosecurity Regulation 2016*, a sample may be moved into the State, or into or from a biosecurity zone if it will be directed to an approved facility for testing and is quarantine secured. Where required, a sample may also be directed from a biosecurity zone out of the state provided that the sample is being directed for testing and is quarantine secured.

To be deemed *quarantine secured* under the Queensland *Biosecurity Regulation 2016*, a sample must be sealed within three layers of packaging (**Figure 70**) to mitigate the risk of escape of the sample or any biosecurity matter.

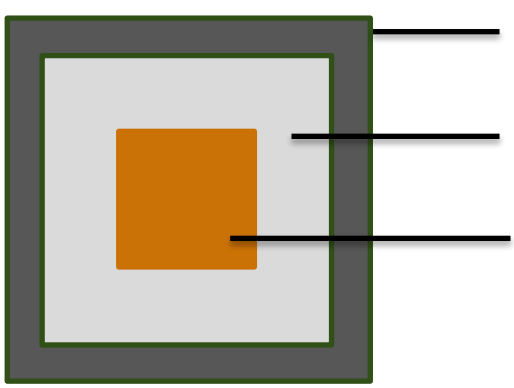


Figure 70. *Packaging layers required to be considered quarantine secured under the Queensland Biosecurity Regulation 2016.*

More information

Queensland *Biosecurity Regulation 2016*
Queensland Government
https://www.legislation.qld.gov.au/view/pdf/asmade/sl-2016-0075

How could a new pest enter Australia?

There are several potential entry pathways by which exotic sugarcane pests could enter Australia. The risks posed by these pathways are sought to be mitigated by international quarantine measures, which are managed by the Australian Commonwealth Department of Agriculture, Fisheries and Forestry (DAFF), and involve comprehensive border controls to screen imported goods, plant material and travellers entering Australia.

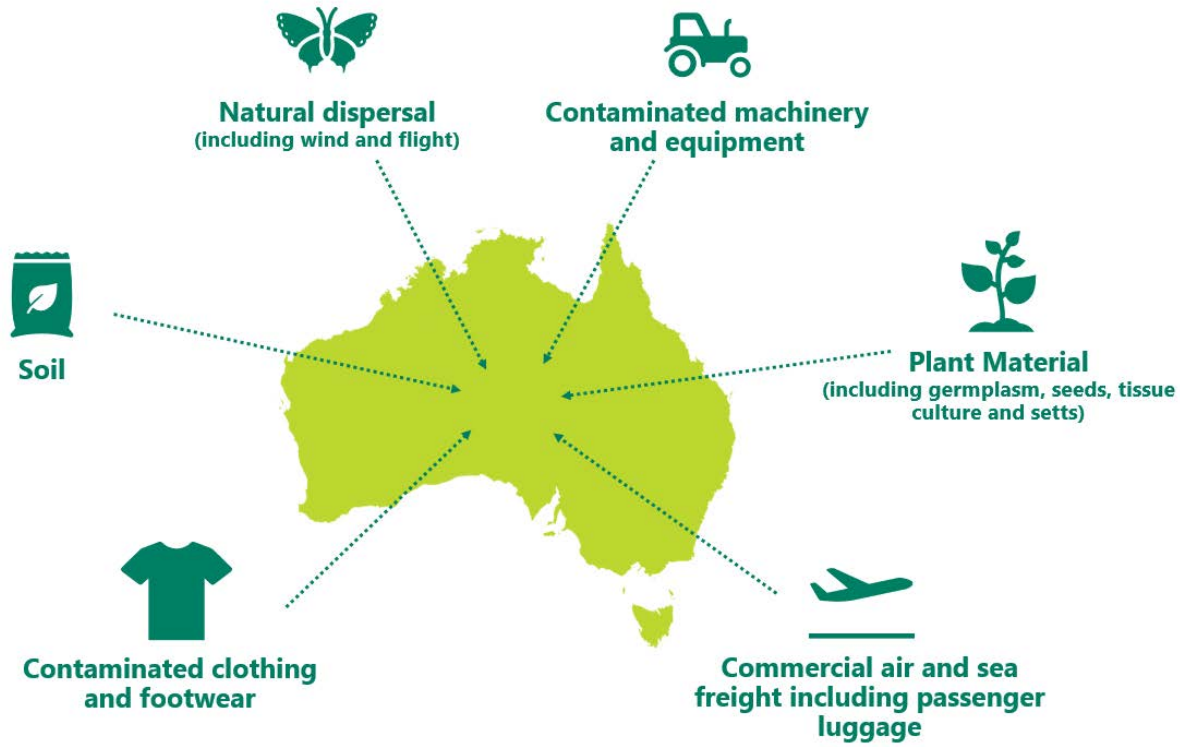


Figure 71. *Potential entry pathways for pests and diseases of sugarcane into Australia.*

	Natural dispersal may include spread via feral animals, winged flight of insects, wind (such as wind-assisted flight or spore dispersal in the case of fungi) as well as dispersal through water including rain and natural waterways.
	Contaminated machinery and equipment may harbour soil and organic matter which could enable entry of pests and diseases and weed seeds.
	Plant Material such as contaminated germplasm, nursery stock, seeds, tissue culture or setts could allow the entry of pests and diseases. As part of Australian quarantine practices, all imported germplasm undergoes 2 years in quarantine at the at the DAFF Post-Entry Quarantine (PEQ) facility in Mickleham (Victoria) to ensure that it is free from exotic pests and diseases before being sent to Meringa for use in the SRA breeding program. Learn more: https://sugarresearch.com.au/growers/biosecurity/.
	Commercial air and sea freight including passenger luggage, imported mail, shipping containers and packaging material such as wooden pallets could provide a means by which pests and diseases could enter Australia.
	Contaminated clothing and footwear - Contaminated clothing and footwear also pose a risk of introducing pests and diseases as well as weeds and plants in the form of seeds.
	Soil - Soil also poses a risk of introducing pests and diseases, for example as insect larvae, fungal spores and weed seeds.

Case Study: Stopping exotic Yellow top sugarcane borer *Chilo infuscatellus*

Status Exotic to Australia

Host range Hosts include *Avena sativa* (oats), *Cymbopogon winterianus* (java citronellagrass), *Cynodon dactylon* (Bermuda grass), *Cyperus rotundus* (purple nutsedge), *Echinochloa colona* (junglerice), *Hordeum vulgare* (barley), *Oryza sativa* (rice), *Panicum* (millets), *Pennisetum glaucum* (pearl millet), *Saccharum officinarum* (sugarcane), *Sorghum bicolor* (sorghum), *Zea mays* (maize).

Symptoms Young larvae eat small holes in leaves, especially in the leaf-sheaths, and at a later stage the growing points are killed. Holes are also present on or near buds.

Figure 72. *Image by Sugar Research Australia.*

Figure 73. *a - Adult yellow top borer moth. Image: Natural History Museum, London. b - Damage caused by the yellow top borer. Image: S Eyres, Department of Agriculture and Food, Western Australia. c - "Dead heart". Image: N Sallam, BSES Ltd.*.*

**BSES = Bureau of Sugar Experiment Stations Limited.*

How is it spread? Flying (adults) allows for local dispersal. Introduction (regulated or unregulated pathways) of infested plants or plant products are the most likely pathways for long distance spread.

How might it enter Australia? Introduction (regulated or unregulated pathways) of infested plants and plant products are the most likely pathways for entry into Australia.

How are these entry pathways regulated? With respect to sugarcane propagative material as a potential import pathway, Australia permits import of sugarcane (*Saccharum* spp.) as nursery stock in the form of tissue culture or setts (cuttings) – not seed. Both forms require a valid import permit, must arrive via air freight only and be subsequently directed to the Department of Agriculture, Fisheries and Forestry Post Entry Quarantine facility in Victoria for disease screening and testing, of which diagnostic testing may be carried out by Sugar Research Australia (SRA) or the Queensland Department of Primary Industries.

Heading Overseas?

Just as moving dirty machinery between and around farms can cause pest and disease problems moving soil from farms overseas can introduce new pests and diseases into Australia's cane growing areas.

Sugar Research Australia has developed the following protocol for people in the Australian sugarcane industry who are visiting overseas sugarcane growing countries:

- *Be aware of the risks of carrying insects and fungal spores on **clothes, notebooks, cameras and other equipment.** Exotic pests and diseases that pose a biosecurity risk to Australia are common in nearly all sugarcane producing countries and **fungal spores can easily be carried on clothing**.*
- *It is mandatory that all travelers who walk through cane fields while overseas **launder their clothing in hot water** before returning to Australia or immediately on return.*
- ***Shoes should be thoroughly cleaned** by scrubbing with a mixture of hot water and detergent or by swabbing with a 70% methylated spirits water solution.*
- *Staff who regularly travel to overseas production areas should **consider leaving personal protective equipment in the country of visitation** for use on subsequent trips to further minimise risk.*
- ***Other equipment should be cleaned and disinfected** with a 70% methylated spirits water solution ensuring all sugarcane residues are removed. These treatments are required to meet the General Biosecurity Obligation as outlined in Queensland State Law*

For more information, visit
https://sugarresearch.com.au/growers/biosecurity/

Measures to prevent the spread of pests and diseases within Australia

Farm biosecurity is a set of management practices and activities used to protect a property from the entry and spread of pests. Farm biosecurity practices will help to protect your farm from weeds, established pests and diseases and from exotic pests in the event of an incursion. It applies to both crop and livestock farming.

For activities that you can implement to prevent the spread of pests and diseases, refer to **Plant Protection Series Volume 1 Plan and Protect: Steps to safeguard your farm against pests, diseases and weeds**.

Measures to prevent the spread of pests and diseases into Australia

International quarantine is managed by the Australian Commonwealth Department of Agriculture, Fisheries and Forestry (DAFF), and involves comprehensive border controls to screen imported goods, plant material and travelers entering Australia.

As part of Australian quarantine practices, all imported germplasm undergoes 2 years in quarantine at the at the DAFF Post-Entry Quarantine (PEQ) facility in Mickleham (Victoria) to ensure that it is free from exotic pests and diseases before being sent to Meringa for use in the SRA breeding program. Learn more: https://sugarresearch.com.au/growers/biosecurity/.

The Sugarcane Industry Biosecurity Committee

The Sugarcane Industry Biosecurity Committee (SIBC) is responsible for oversight of biosecurity issues affecting the Australian sugarcane industry. The Committee contains representatives with expertise in the sugarcane industry, plant health and biosecurity (SRA, 2025b).

Biosecurity Planning for the Australian Sugarcane Industry

Biosecurity plans (BP) set out an agreed range of activities to mitigate risks from exotic plant pests to industries or the environment. A Biosecurity Plan for the Australian sugarcane industry was developed using a collaborative approach to identify the greatest biosecurity threats to Australia's sugarcane industry.

As part of the BP development process, industry and scientific experts were engaged to review and identify High Priority Pests of the Australian sugarcane industry considered exotic to Australia.

Figure 74. *The Biosecurity Plan for the Australian sugarcane industry identifies the greatest biosecurity threats to Australia's sugarcane industry.*

Preparing for Emergency Responses

The Emergency Plant Pest Response Deed

The Emergency Plant Pest Response Deed (EPPRD) is a formal, legally binding document between Plant Health Australia (PHA), the Australian Government, each State and Territory Government and Plant Industry signatories that defines how responses to Emergency Plant Pests (EPPs) are managed and funded. It came into effect on 26 October 2005 after several years of negotiation between government and industries. CANEGROWERS is the peak industry body that is signatory to the EPPRD on behalf of the Australian sugarcane industry, representing sugar cane and sugar cane cut for plants.

The current version of the EPPRD can be downloaded from the PHA website.

What is an Emergency Plant Pest?

An Emergency Plant Pest, or EPP, is an exotic pest or disease (or disease vector) that would be economically and/or environmentally harmful and is considered to be in the national interest for Australia to be free of.

The full definition of an EPP can be found on the PHA website.

Categorising EPPs

EPPs are also categorised to guide Cost Sharing of response costs between Government and Industry signatories. There are four different categories which reflect the relative benefit to industry or the public being free of the EPP into the future. For example, Category 1 pests have a high public benefit of eradication with 100% of response costs funded by Government EPPRD signatories. Category 4 pests have a high industry benefit of eradication with the costs shared by Government (20%) and Industry (80%) EPPRD signatories.

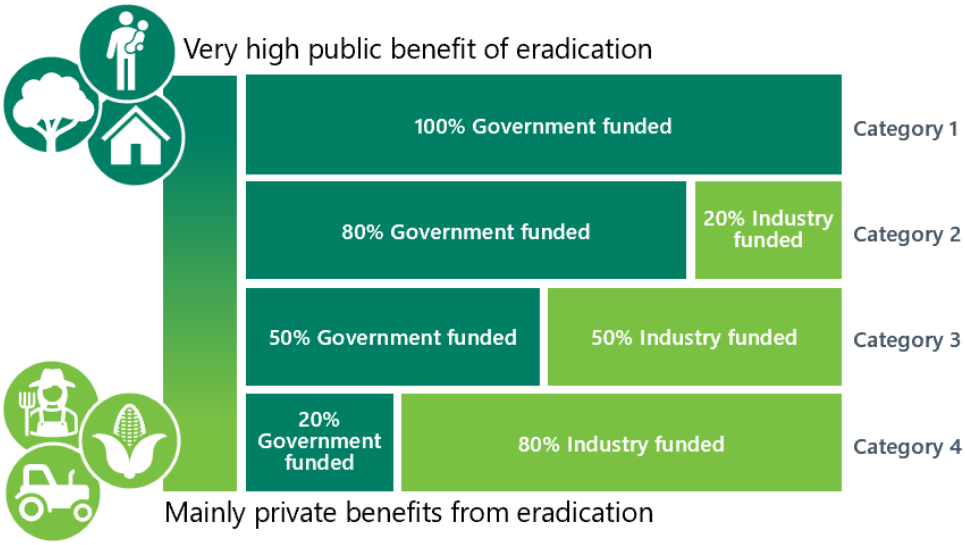


***Figure 75**. Emergency Plant Pest (EPP) categorisation related to Cost Sharing arrangements within a Response Plan.*

How is industry involved in an EPP response?

Industries that are signatories of the EPPRD are represented and consulted in each step of a response. As a signatory to the EPPRD, CANEGROWERS provides representation for the Australian sugarcane industry in key decision-making activities in response to an EPP.

In response to an EPP affecting the sugarcane industry, CANEGROWERS is termed an Affected Industry Party and will be asked to be a member of two committees:

- the **Consultative Committee on Emergency Plant Pests (CCEPP)**
- the **National Management Group (NMG)**

During a response, **Industry Liaison Officers (ILOs)** are also mobilised. ILOs are industry representatives that are invited to work in a control centre during a response and are a critical link between the Incident Management Team and affected industry/s. They provide an industry perspective on response activities and provide updates to industry regarding the response.

Committees involved in an EPP Response

The CCEPP

The CCEPP is comprised of authorised representatives from Governments, Affected Industry Parties (i.e., CANEGROWERS), and Plant Health Australia. The CCEPP is responsible for providing technical guidance on the response and making recommendations to the NMG.

The NMG

This group is also comprised of authorised representatives from Government Parties, Affected Industry Parties and Plant Health Australia.

The NMG is responsible for making key decisions on national policy and resourcing needs throughout a response. Decisions made by the NMG including approving the Response Plan are made based on the advice from the CCEPP.

What is a Response Plan?

A Response Plan covers all activities required to eradicate the EPP, as well as activities to be undertaken if the EPP is found to either be no longer technically feasible or too costly to eradicate. The Plan also includes a response budget that outlines what response costs will be shared between government agencies and the affected parties (industries). The Response Plan is prepared by the **Lead Agency** in collaboration with the **CCEPP**. The Lead Agency is the government department responsible for biosecurity in the state or territory where the pest was detected. If the pest incursion has spread across state borders each state shares the role of Lead Agency.

Overview of an EPP incident

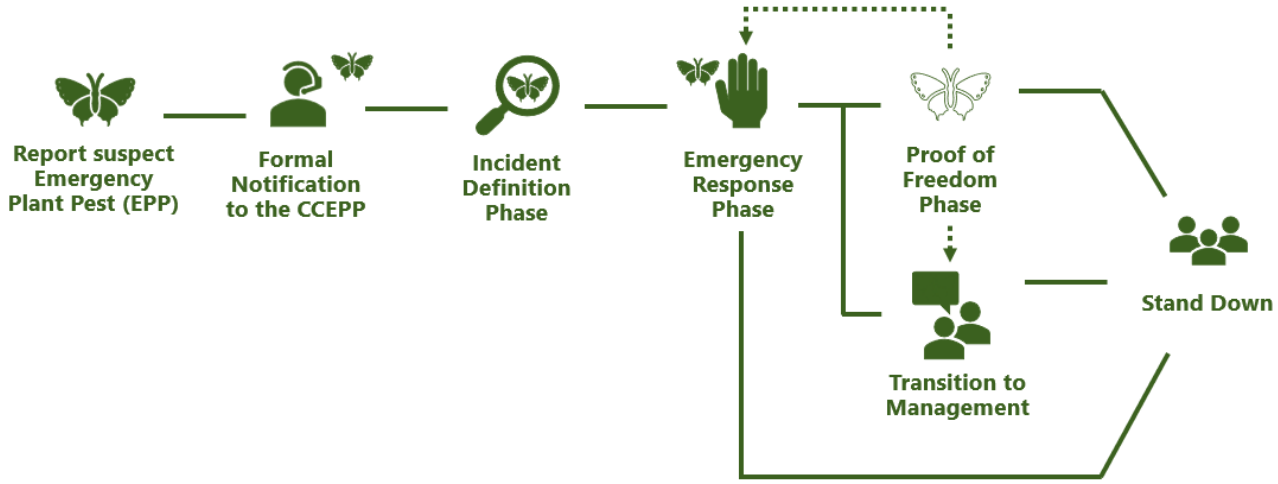


***Figure 76**. Overview of an EPP incident. Note: The dotted lines between the Proof of Freedom Phase and the Emergency Response Phase and Transition to Management Phase represent the possibility for further pest populations detected during the Proof of Freedom Phase to trigger either a return to an Emergency Response Phase; or if eradication is considered no longer feasible, the emergency response may be stood down or enter a Transition to Management Phase.*

Report suspect EPP

The suspect EPP is detected and reported to the State or Territory government.

Formal Notification to the CCEPP

Within 24 hours of a suspected EPP being detected a formal notification to the CCEPP takes place. This involves the Chief Plant Health Manager of the state or territory in which the pest or disease was detected notifying the Chair of the CCEPP (the Australian Chief Plant Protection Officer).

Incident Definition Phase

The Incident Definition phase involves collecting information to help identify appropriate actions to be taken and starting any initial response activities. The aim is to determine whether a Cost Shared eradication program should be undertaken based on current knowledge of the EPP and its distribution. During this phase, emergency containment measures may be implemented and a Response Plan developed.

Emergency Response Phase

If the NMG agrees to a Response Plan, an Emergency Response may commence. This phase involves implementing the Response Plan to eradicate the EPP which may involve activities such as surveillance and tracing, destruction and/or decontamination, movement restrictions and providing updates to industry on the response's progress to industry and the public.

Proof of Freedom Phase

A Proof of Freedom Phase may follow an Emergency Response if the CCEPP determines that the eradication appears to have been successful. The aim of this phase is to confirm if the pest has been eradicated. The key requirements to achieve Proof of Freedom are defined in the Response Plan. This is usually in the form of a surveillance plan that includes the host plants to survey, where to look, how often surveillance needs to occur, and the length of time required to prove pest freedom. This phase continues until the NMG determines that the EPP has been eradicated. In some cases, further pest populations are detected which can trigger either a return to an Emergency Response Phase; or if eradication is considered no longer feasible, the emergency response may be stood down or enter a Transition to Management Phase.

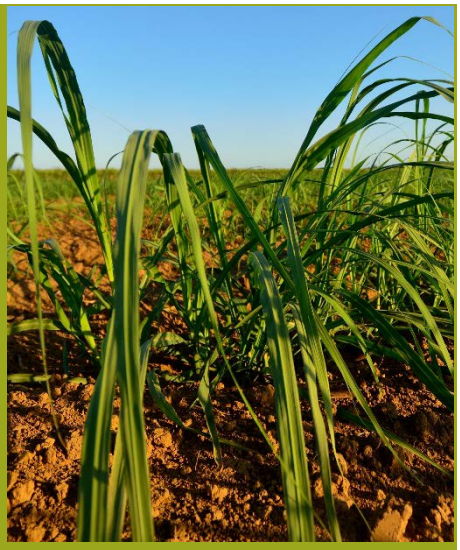
Transition to Management Phase

In some cases, it may not be feasible to eradicate an EPP. If this occurs, Transition to Management may commence to help industry learn how to manage the pest as it becomes established in Australia. This phase generally lasts for a maximum period of 12 months unless agreed by the NMG. The activities during this phase are determined in consultation with the affected industries and may include the development of control options through new research, gaining new chemical registration or grower education and training programs.

Stand Down

Stand Down takes place following the NMG declaring the EPP has been successfully eradicated or is deemed either no longer technically feasible or too costly to eradicate. The Stand Down aims to return industry to normal business and determine the total shared costs of implementing the Response Plan.

What are Owner Reimbursement Costs?



To contain the spread and eradicate an EPP, a property may need to be quarantined, crops may need to be destroyed, or a grower may be required to undertake actions that are not part of their normal production practices (such as additional chemical controls or a period of forced fallow). Implementing these requirements often results in additional costs or potential losses to growers.

Owner Reimbursement Costs, or ORCs, are payments made to eligible individuals to cover specific costs or losses incurred during a response. They are an agreed Cost Sharable component of the EPPRD.

Where to find more information on Owner Reimbursement Costs

The Guidelines for owner reimbursement costs under the plant pest deed provide an overview of the framework for calculating ORC payments for the plant industry sectors, with the provision of the EPPRD defining:

- what comprises an ORC payment,
- who may receive a payment,
- how Cost Sharing is applied, and
- the general valuation and payment processes undertaken.

For more information on ORCs, refer to the PHA website.

The most recent ORC framework for the Sugarcane industry was developed in 2007 and is available on the PHA website.

Want to learn more?

Free training is available on Biosecurity Online Training platform (BOLT). Register your free account to get started.

- Growers - Pest Reporting and Responses course
- Researchers – Pest Reporting and Responding course
- Plant Surveillance
- Plant Biosecurity in Australia course
- Hitchhiker Pests

The Outbreak website is also a great resource to stay informed on the latest response information.

Learn more about the guidelines for responding to EPPs in PLANTPLAN. The latest version of PLANTPLAN is available on the PHA website.

Production Value Summary Record

As noted in the above section, ORCs are payments made to individuals to cover costs or losses incurred during a response and are an agreed component of the EPPRD.

Completing a production value summary each year and keeping supporting documentation will increase the accuracy of Owner Reimbursement Cost calculations if required during an eradication under an approved Response Plan.

Typically, the normal crop cycle for sugarcane involves a plant crop followed by four ratoon crops.

Year/Season:

<table>
<tr><th colspan="5">Crop value</th></tr>
<tr><td rowspan="3">Area cropped</td><td colspan="4">Total:</td></tr>
<tr><td colspan="4">Breakdown by variety</td></tr>
<tr><td>Variety</td><td colspan="2">Location</td><td>Area cropped</td></tr>
<tr><td>Yield
(Tick which applies)
Sugar Cane ☐
Sugar Cane (cut for plants) ☐</td><td>Variety</td><td>Crop Type
(Tick which applies)
Plant crop ☐
Ratoon crop ☐
Year of the ratoon crop (N/A for Plant crop):</td><td>Yield</td><td>Comments</td></tr>
<tr><td>Yield
(Tick which applies)
Sugar Cane ☐
Sugar Cane (cut for plants) ☐</td><td>Variety</td><td>Crop Type
(Tick which applies)
Plant crop ☐
Ratoon crop ☐
Year of the ratoon crop (N/A for Plant crop):</td><td>Yield</td><td>Comments</td></tr>
<tr><td>Yield
(Tick which applies)
Sugar Cane ☐
Sugar Cane (cut for plants) ☐</td><td>Variety</td><td>Crop Type
(Tick which applies)
Plant crop ☐
Ratoon crop ☐
Year of the ratoon crop (N/A for Plant crop):</td><td>Yield</td><td>Comments</td></tr>
</table>

<table>
<tr><th colspan="5">Crop value (continued)</th></tr>
<tr><td>Yield
(Tick which applies)<table><tr><td>Sugar Cane</td><td></td></tr><tr><td>Sugar Cane (cut for plants)</td><td></td></tr></table></td><td>Variety</td><td>Crop Type
(Tick which applies)<table><tr><td>Plant crop</td><td></td></tr><tr><td>Ratoon crop</td><td></td></tr></table>Year of the ratoon crop (N/A for Plant crop):</td><td>Yield</td><td>Comments</td></tr>
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(Tick which applies)<table><tr><td>Sugar Cane</td><td></td></tr><tr><td>Sugar Cane (cut for plants)</td><td></td></tr></table></td><td>Variety</td><td>Crop Type
(Tick which applies)<table><tr><td>Plant crop</td><td></td></tr><tr><td>Ratoon crop</td><td></td></tr></table>Year of the ratoon crop (N/A for Plant crop):</td><td>Yield</td><td>Comments</td></tr>
<tr><td rowspan="2">Market price</td><td rowspan="2">Market location</td><td rowspan="2">Variety</td><td colspan="2">Price</td></tr>
<tr><td colspan="2">Evidence (e.g. receipts)</td></tr>
<tr><th colspan="5">Capital items</th></tr>
<tr><td>Items installed on site (e.g. harvest bins, protective covers etc.)</td><td colspan="2">Item details</td><td>Amount</td><td>Cost (depreciated)</td></tr>
<tr><th colspan="5">Crop management and harvesting costs</th></tr>
<tr><td>Labour costs</td><td colspan="2">Detail (e.g. Number of staff hours for harvest over set period)</td><td colspan="2">Amount</td></tr>
<tr><td>Machinery costs</td><td colspan="2">Detail (e.g. Cost to run/hire machinery for harvest or other activity)</td><td colspan="2">Amount</td></tr>
<tr><td>Fertiliser and Pest management costs</td><td colspan="2">Detail (e.g. amount of fertiliser or spray used and cost)</td><td colspan="2">Amount</td></tr>
<tr><td>Contractor costs</td><td colspan="2">Detail (e.g. cost of contractor and relevant activity)</td><td colspan="2">Amount</td></tr>
</table>

Crop management and harvesting costs (continued)		
Other costs relating to crop management and harvesting		
Replanting costs		
Costs from when the final ratoon crop has been harvested to when a new plant crop has been planted	Detail	Amount
Net profit from season		
Total sales	Value:	Evidence (e.g. receipt):
Total costs	Value:	Evidence (e.g. receipt):
Total net profit	Value:	Evidence (e.g. receipt):

Useful Contacts

General Contacts

ORGANISATION	
CANEGROWERS	**Phone:** 07 3864 6444 **Website:** http://www.canegrowers.com.au/
Australian Sugar Manufacturers (formerly the Australian Sugar Milling Council)	**Phone:** +61411933500 **Email:** info@sugarmanufacturers.org **Website:** https://sugarmanufacturers.org/
Sugar Research Australia	**Phone:** 07 3331 3333 **Email:** sra@sugarresearch.com.au **Website:** https://sugarresearch.com.au/
Plant Health Australia	**Phone:** 02 6215 7700 **Email:** biosecurity@phau.com.au **Website:** https://www.planthealthaustralia.com.au/
Farm Biosecurity	**Phone:** 02 6215 7700 **Email:** biosecurity@phau.com.au **Website:** https://www.farmbiosecurity.com.au/

Productivity Services

Productivity Services are regional organisations that provide clean seed, services to prevent pest and disease spread, as well as extension advice, to growers. Productivity Services offer support to sugarcane producers in various Production Districts.

DISTRICT	PRODUCTIVITY SERVICE COMPANIES
Far North	**MSF Sugar** Website: https://www.msfsugar.com.au/ Phone: +61 7 4043 3333 Address: 47 Gordon Street, Gordonvale, QLD, 4865
	Innisfail Babinda Cane Productivity Services (IBCPS) Website: https://www.ibcpsl.com/ Phone: 4064 3300/ 0428 774 922 Address: Innisfail Japoon Rd, South Johnstone QLD 4859
	Mossman Agricultural Services (MAS) Website: https://www.crt.com.au/store/mossman-agricultural-services/ Phone: (07) 4098 2286 Address: 107 Alchera Drive Mossman, QLD, Australia, Queensland 4873
South Johnstone	**Innisfail Babina Cane Productivity Services (IBCPS)** Website: https://www.ibcpsl.com/ Phone: 4064 3300/ 0428 774 922 Address: Innisfail Japoon Rd, South Johnstone QLD 4859

DISTRICT	PRODUCTIVITY SERVICE COMPANIES
Tully	**Tully Cane Productivity Services Limited (TCPSL)** Website: - Phone: (07) 4088 0706 Address: Dallachy Road, Tully QLD 4854
Herbert	**Herbert Cane Productivity Services Limited (HCPSL)** Website: https://hcpsl.com/ Phone: (07) 4776 1808 Address: 181 Fairford Road, Ingham Queensland 4850
Burdekin	**Burdekin Productivity Services** Website: https://bps.net.au/ Phone: (07) 4783 1101 Address: 210 Old Clare Road, Ayr QLD 4807
Central	**Sugar Services Prosperine (SSP)** Website: https://www.sugarpros.com.au/ Phone: Manager: (07) 4945 1844/0488 777 657 Address: 88 Main Street Proserpine, QLD
	Mackay Area Productivity Service (MAPS) Website: https://www.maps.org.au/ Phone: 0419 763 192 Address: 26135 Peak Downs Hwy Te Kowai, QLD, 4740
	Plane Creek Productivity Services Limited (PCPSL) Website: https://pcpsl-planecreekpsl.opendata.arcgis.com/ Phone: (07) 4956 1488 Address: Canegrowers Building 36 Broad St Sarina QLD 4737
Southern	**Bundaberg Sugar Services (BSSL)** Website: https://www.bdbcanegrowers.com.au/bundaberg-sugar-services/ Phone: (07) 4151 2555 Address: 32 Bourbong Street, Bundaberg Qld 4670
	Isis Productivity Services (IPL) – Associated with the Isis Central Mill Co. Ltd. Website: https://www.isissugar.com.au/ Phone: (07) 4126 4400 Address: Kevin Livingston Drive, Isis Central, QLD 4660
	Maryborough Cane Productivity Services (MCPS) Website: - Phone: - Address: Maryborough, Queensland, Australia
	Rock Point Productivity Services Website: - Phone: - Address: -
	Sunshine Sugar Agricultural Services (AgServices) – Sunshine Sugar's in-house Agricultural Services Team Website: https://www.sunshinesugar.com.au/agricultural-services-in-nsw-sugar-industry/ Phone: Corporate Office: (02) 6681 2700 Address: Corporate Office: Ballina, Suite 1, Level 1, Cnr River and Martin Streets, Ballina, NSW 2478

Sugar Research Australia

Sugar Research Australia (SRA) is the Research and Development organisation representing the Australian sugarcane industry. SRA operates numerous research farms, laboratories and offices in sugarcane growing areas.

STATION/FACILITY	
Acacia Ridge	**Address:** 17 Iris Place, Acacia Ridge, QLD, 4110 **Phone:** (07) 3331 3333 **More information:** https://sugarresearch.com.au/location/acacia-ridge/
Brisbane	**Address:** Level 10, 300 Queen Street, Brisbane, QLD, 4000 **Phone:** (07) 3331 3333 **More information:** https://sugarresearch.com.au/location/brisbane/
Broadwater	**Address:** Broadwater Mill, 117 Baraang Drive, Broadwater, NSW, 2472 **Phone:** (02) 6620 8200 **More information:** https://sugarresearch.com.au/location/broadwater/
Bundaberg	**Address:** 314 Pashleys Road, Welcome Creek, QLD, 4670 **Phone:** 0436 805 457 **More information:** https://sugarresearch.com.au/location/bundaberg/
Burdekin	**Address:** 30962 Bruce Highway, Brandon, QLD, 4808 **Phone:** (07) 4783 8600 **More information:** https://sugarresearch.com.au/location/burdekin/
Ingham	**Address:** 181 Fairford Road, Ingham, QLD, 4850 **Phone:** (07) 4776 8200 **More information:** https://sugarresearch.com.au/location/ingham/
Mackay	**Address:** 26135 Peak Downs Highway. Te Kowai, QLD. 4740 **Phone:** (07) 4963 6810 **More information:** https://sugarresearch.com.au/location/mackay/
Meringa	**Address:** 34 Hall Road, Gordonvale, QLD, 4865 **Phone:** 07 4056 4500 (District manager: 0476 807 355) **More information:** https://sugarresearch.com.au/location/meringa/
Tully	**Address:** 216 Dallachy Road, Silky Oak, QLD, 4854 **Phone:** (07) 4056 4500 **More information:** https://sugarresearch.com.au/location/tully/
Woodford	**Address:** 90 Old Cove Road, Woodford, QLD, 4514 **Phone:** (07) 5434 5900 **More information:** https://sugarresearch.com.au/location/woodford/

For more information on the above stations and facilities, visit https://sugarresearch.com.au/contact/.

***Figure 77**. Distribution of Sugar Research Australia's research stations and facilities throughout Australia. Image by Sugar Research Australia.*

Government

ORGANISATION	
Australian Department of Agriculture, Fisheries and Forestry	**Phone:** 02 6272 3933 **Website:** https://www.agriculture.gov.au/
New South Wales Government - Department of Primary Industries and Regional Development	**Phone:** 1800 680 244 (Biosecurity) or (02) 6391 3100 **Website:** https://www.dpi.nsw.gov.au/
Northern Territory Government – Department of Agriculture and Fisheries	**Phone:** 1800 084 881 (Biosecurity) or 08 8999 5511 (General Switchboard) **Website:** https://daf.nt.gov.au/
Queensland Government – Department of Primary Industries	**Phone:** 13 25 23 **Email:** info@daf.qld.gov.au **Website:** https://www.daf.qld.gov.au/
Western Australian Government – Department of Primary Industries and Regional Development	**Phone:** +61 1300 374 731 (General) or 1800 084 881 (Exotic Plant Pest Disease Hotline or Pest and Disease Information Service) **Email:** enquiries@dpird.wa.gov.au **Website:** https://www.agric.wa.gov.au/

Contact Information for Reporting Suspect Pests

Spotted anything unusual? Call the Exotic Plant Pest Hotline 1800 084 881

New South Wales

Answered 08:30 – 16:30 Monday to Friday. Please leave a message outside of these hours, which will be followed up the next business day.

biosecurity@dpi.nsw.gov.au

Online reporting form

Queensland

Answered 08:00 – 17:00 Monday to Friday (09:00 – 17:00 Thursday). Calls are answered outside these hours by a third party who will take your message and organise a response from a biosecurity officer as soon as possible, depending on the urgency of the report.

13 25 23

Note: In some states, the Exotic Plant Pest Hotline operates only during business hours. Outside these hours, leave your full contact information and a brief description of the issue and your call will be followed up as soon as possible. Every report will be taken seriously, checked out and treated confidentially.

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