



Nursery & Garden Industry
Australia

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Diagnosing unusual or rare plant pests

An estimated 40 per cent of global food crops are lost every year due to plant pests and disease, equating to around US\$220 billion annually and invasive insects US\$70 billion, according to the United Nations Food and Agriculture Organization.

For growers, correct pest diagnosis can play a pivotal role in whether a crop thrives or struggles in the nursery. An incorrect diagnosis can be a costly reminder that disease symptoms are not always, as they seem.

About Grow Help

The good news is there are services that can shed light on plant diseases and insect pests, especially those with unusual or rare symptoms, such as Grow Help Australia, which is offered through the Queensland Department of Agriculture and Fisheries (QDAF).

Grow Help is a valuable and cost-effective resource for Australian production nurseries, and aims to improve the quality and productivity of crops across a wide range of production systems.

Growers send in samples of plants or parts of plants, which enables Grow Help to use a range of techniques to identify and diagnose pests and pathogens, as well as provide recommendations to eliminate the plant pest.

GROWER SURVEY

A recent Grow Help Australia survey found that 90 per cent of respondents considered the plant diagnostic service to be highly effective and inexpensive in diagnosing plant problems.

Almost 92 per cent of respondents found that recommendations provided by Grow Help were either mostly relevant or very relevant to, identify, eradicate, trouble-shoot or manage the specific pest problem.

Source: 2018 Grow Help Australia Diagnostic Service Evaluation

Benefits for growers

QDAF Senior Entomologist Dr Andrew Manners said growers who are confident with their own diagnosis can still benefit from sending in samples for testing, as part of strengthening quality assurance processes.

Once completed, growers receive a written report with a list of tests carried out on each sample, the outcomes of the test, and recommendations tailored for a nursery, plants and any pests or disease detected.

Dr Manners believes that diagnostic services are particularly useful for production nurseries that have plants with unusual symptoms, are seeing poor growth with no obvious cause, or have tried management options that have failed.

“It will save both time and money to confirm the pest or disease causing issues, and sooner is better than later,” Dr Manners said.

“Understanding the biology of the organism in question can also allow for more specific treatment and prevention.”

Types of tests*

Grow Help Australia has an experienced team working to provide growers with an efficient and accurate diagnosis of plant problems.

There are three tests available through GrowHelp and are categorised as Basic, Complex or Specialist.

1. Basic Tests include those that can be completed immediately and in a short timeframe. These cover:

- Initial lab observations
- Dissection of plant material
- Bacterial ooze tests
- Other microscopic examinations completed without culturing or rearing the cause.

*Source: <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/agribusiness/grow-help-australia>



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2. Complex tests include those that can take an extended time frame, from a few days to several weeks. These cover:

- Isolating and growing fungal or bacterial pathogens on specific media
- Phytophthora soil or root tests
- Mounting and identifying insect specimens.

3. Specialist tests are usually more expensive as they require complex ingredients and take longer to run than Basic and Complex tests. These cover:

- Electron microscopic examination for virus particles
- Molecular techniques including PCR, DNA sequencing and ELISA tests to identify pathogen species
- Indexing of plant material to demonstrate mother stock plants are free from pathogens; to support a plant health certificate; and to meet interstate quarantine requirements (particularly for stock into WA).

Note: Grow Help does not provide plant health certificates, however relevant reports can be used to support market access.

Tests not available through Grow Help

- Plant ID of species, variety, or cultivar
- Detection of insecticides, fungicides or herbicides on the plant or growing media
- Analysis of nutrient levels in the plant or growing media; and detection of bacteria in seeds, soil or growing media.

DID YOU KNOW?

Under the levy-funded project, Building the resilience and on-farm biosecurity capacity of the Australian production nursery industry (NY15002), production nurseries that are signed up to the Nursery Industry Accreditation Scheme Australia (NIASA) will receive 10 free tests per year through Grow Help, while other levy-paying production nurseries can take advantage of cost-effective testing.

Selecting and packaging your plants for testing

An accurate diagnosis can only be reached if the sender has carefully selected and packaged the specimens for testing. These requirements differ for each plant type, such as:

Containerised Plants

- Try selecting plants that show initial and advanced symptoms.
- Sending multiple healthy and unhealthy plants can significantly help in diagnosing the problem.
- When posting small to medium containerised plants; cut the stem of the plant and bag the foliage, place the container including the growing media in a separate bag from the foliage, and tie the bag around the stem as best as possible.
- For very large plants, it may be best to send a portion of the above-ground parts with a separate bag of some roots and growing media.
- Contact GrowHelp for any queries.

Seedlings and Cuttings

- Firstly, wrap roots of the plants in cling wrap, followed by more cling wrap around the base of all seedlings.
- Secondly, wrap these items in paper towel and place in a zip-lock bag. Seedlings placed loosely in bags can degrade quickly.
- Grow Help recommends sending a minimum of three plants, and more if plants are very small or plants are dying back.
- For stem dieback problems on smaller plants, it is recommended a dozen plants are sent for testing.

In-ground and hydroponic crop plants

- Submit whole plants with growing media around roots to increase ability to diagnose problem accurately.
- Bag soil and root ball to avoid contaminating the entire sample as for many cases, above ground symptoms are

a result of root and stem vascular problems.

- For trees grown in-ground, email images of the problem to growhelp@daf.qld.gov.au. In many cases, the entire plant is required, especially if it is young.
- Stems can be cut into sections of 50 – 100cm for transition and, for older or larger trees, a sample of soil and roots in combination with stems and foliage may be sufficient. Images of the trees *in situ* are also very beneficial.

Completing your sample

Delivering specimens quickly and including detailed information about the problem on the online [sample submission form](#) is essential.

Sending your samples

Prior to sending your sample, ensure that you are meeting any quarantine requirements.

Sending plants on a Monday or Tuesday is best so they don't perish in transport; overnight couriers are recommended, but express post can also be effective. For local businesses, there is also an option for drop off at the QDAF loading dock.

Grow Help will contact the sender by phone or email to acknowledge the sample has been received. Diagnosing diseases can take a few weeks, while identifying insects may be faster.

Costs for plant samples

NIASA businesses receive 10 free samples per year. For Non-NIASA accredited businesses, costs can range from:

- Basic - \$49.40 - \$71.90
- Complex - \$85.50 - \$125.85
- Specialist: \$100 - \$250

Contact Grow Help Australia for a quote regarding molecular tests, which generally range between \$100 to \$250. For more information, visit the Grow Help Australia [website](#).