

A NEW DIAGNOSTIC TOOL GIVES GROWERS THE UPPER HAND IN CONTROLLING DISEASE

By Dr Gordon Rogers

A mushroom industry-funded project has delivered a commercially available early disease detection service which has revolutionised the way growers manage disease.

Growers can now identify disease early, whether in compost, grow room, or the crop itself, facilitating timely action to manage diseases and minimise losses.

For example, the system can identify *Trichoderma aggressivum*, a species of green mould that is highly damaging to yield but nearly impossible to distinguish visually from other less serious green moulds.

Interestingly, the PCR test used to detect *Trichoderma* uses the same technology as the gold standard PCR test for detecting COVID-19.

The PCR test can also identify Dry Bubble (*Lecanicillium fungicola*), Cobweb (*Cladobotryum* sp.) and Bacterial Blotch. All four diseases are included in the same testing 'panel', meaning that a single test can detect any of the diseases above in any one sample provided.

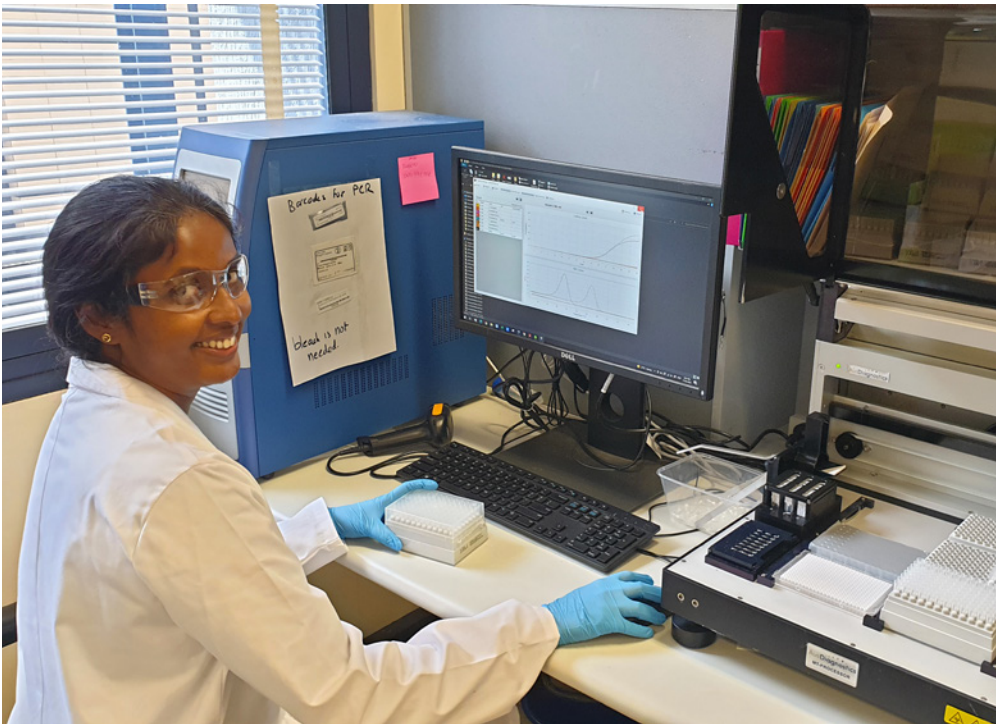
The results from a single sample give a positive or negative for a range of species (see Table 1), as well as an indication of how much disease is present.

Quick turnaround of test results, early detection before symptoms are evident, and cost-effectiveness are all major benefits of the new testing service.

The PCR-based testing service was developed by a Hort Innovation project (MU12007) and is now fully operational.



Trichoderma (left) and dry bubble (right) are just two of the diseases that can be tested for using the PCR testing service



AHR employee Samali Perera runs mushroom samples through the PCR machine

The development team was led by Associate Professor Michael Kertesz from the University of Sydney. Partners included AusDiagnostics, who provided the PCR delivery platform, and disease experts Judy Allan and Dr Warwick Gill. Trials were carried out by the Marsh Lawson Mushroom Research Unit (MLMRU).

The project was managed by Applied Horticultural Research (AHR) who are now also providing the testing service commercially from their Sydney laboratory.

The table below shows the diseases which can be detected using the PCR testing service developed by Hort Innovation project MU12007.

Testing and control measures on farm are effective at controlling disease

The mushroom disease testing service has already proved popular, with over 5,000 samples processed since August 2020.

As well as identifying disease, testing after cookout can provide vital information on whether control measures taken at the farm have been effective.

AHR has seen some encouraging trends in the testing results, showing that PCR testing for disease, coupled with corrective action, is effective at controlling disease.

COMMON NAME OF DISEASE	SCIENTIFIC NAMES
Cobweb	<i>Cladobotryum mycophilum</i> (<i>Hypomyces odoratus</i>)
	<i>Lecanicillium</i> spp.
Dry bubble	<i>Lecanicillium fungicola</i> (<i>Verticillium fungicola</i>)
	<i>Trichoderma</i> spp.
Green mould	<i>Trichoderma aggressivum</i>
Bacterial blotch	<i>Pseudomonas tolaasii</i>
	<i>Pseudomonas gingeri</i>

Table 1. The diseases which can be detected using the PCR testing service developed by Hort Innovation project MU12007

AHR principal, Dr Gordon Rogers says “Farms using this service see a steady decline in positives for diseases they are targeting.”

“This means the control measures on farms are working, and testing is confirming their effectiveness.”

How to get your samples tested

PCR testing, developed during the Hort Innovation project, is now being offered as a commercial service by AHR, using a methodology commercialised by AusDiagnostics.

The PCR technique is highly sensitive at detecting diseases. A sample containing even the smallest amount of the disease can usually be detected before any symptoms are evident in the crop.

Very importantly, the way the sample is collected is critical.

A video produced by Judy Allan and Warwick Gill demonstrates how to collect samples for disease testing

from growing rooms, equipment, work areas, mushroom caps and compost. [Click here](#) to view the video or visit the AGORA website for both the video and appropriate control measures.

To test for the presence of Trichoderma, Cobweb, Dry Bubble or Blotch disease, send your samples by express post to the AHR diagnostic laboratory in Sydney to:

Applied Horticultural Research PO Box 917 Alexandria NSW 1435

For more information on how to collect and send samples to the laboratory, visit the AHR website <https://ahr.com.au/mushroom-disease-diagnosis-service>

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Samples being prepared for PCR testing

Hort Innovation | MUSHROOM FUND
Strategic levy investment

This project has been funded by Hort Innovation using the mushroom research and development levy and funds from the Australian Government. For more information on the fund and strategic levy investment visit horticulture.com.au