

INSIDE THE MARSH LAWSON MUSHROOM RESEARCH CENTRE

By Paulette Baumgartl

Research and development underpin new technology. For the mushroom industry this is no different. A dedicated research centre is one driver of important developments, as industry seeks ways to adapt and respond to challenges.

Research is a systematic mechanism by which we can answer questions and understand processes. Data and discovery facilitate an evidence-based approach to solving problems. Research can optimise processes on farms, ultimately improving both their economic and environmental bottom lines.

The Australian mushroom industry has long enjoyed a fruitful relationship with researchers. Systems and processes directing current mushroom growing practice are based on efforts from past research, including studies into compost, pest and disease control, and harvest and post-harvest technology.

In this context, it is welcome news when universities and industry collaborate. This is exemplified by the Marsh Lawson Mushroom Research Centre (MLMRC), situated within The University of Sydney.

Dr Gordon Rogers, Director of Applied Horticultural Research, reminded the mushroom community of this unique facility at the AMGA conference, highlighting its capacity to support growers and the industry as a whole.

The aim of the centre is to contribute to a strong research capacity for the Australian mushroom industry and operate a world class research unit.

"The centre provides research leadership, engages with global leaders in mushroom research, and communicates its findings," Dr Rogers said.

As issues are similar around the world, Dr Rogers believes it makes sense to engage with global researchers and include international members on the steering committee.

"We plan to pursue international research collaborations, including students. This will help us become more involved in the International Society for Mushroom Science," he said.

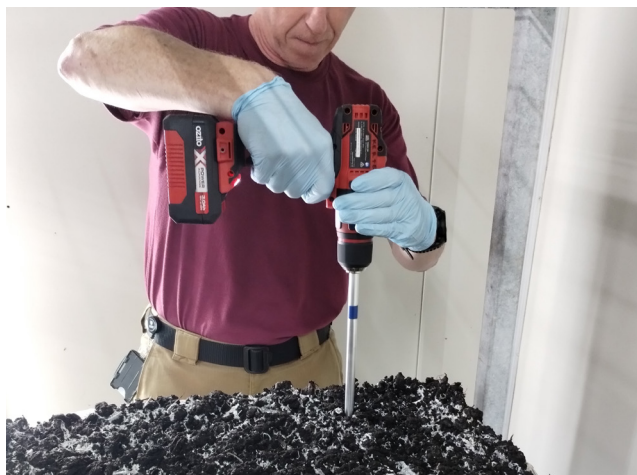
Activities at the MLMRC are guided by a steering committee, which includes researchers, growers, and composters. This group approves and prioritises activities, as well as identifying and directing research at the centre.

The unit itself

The unit has existed in one form or another for 30 years. It was originally a simple growing facility in a building basement. It has been in its current form for the last 10. Located within the grounds of the University of Sydney, it has two growing rooms, each with a 72- block capacity and full environmental controls including a boiler for cookout; it is an ideal testing facility for industry.



Drip irrigation trial before (left) and after (right) casing



Dr Phil Butterworth collecting a sample of compost + casing



Sandra Evangelista and Tyler Kristensen assess dry bubble

Adjacent to the growing rooms is a well-equipped laboratory, with sample storage freezers.

Two trained growers (AHR agricultural scientist Umberto Calvo and PhD student Sandra Evangelista), supervised by Tim Adlington (Steering Committee Chair), currently operate the facility.

The University of Sydney has provided ongoing support to the unit with maintenance, new equipment and running costs, including a new boiler, humidifiers, and an overhaul of the cooling system.

“The industry is well-supported by the university, and we are lucky to have this ongoing assistance,” Dr Rogers said.

The growing rooms are well maintained and highly climate controlled, with PCR testing between crops ensuring cleanliness and other commercial standards are upheld.

“While not a farm, the unit is similar enough to a growing room to conduct trials with a fair amount of confidence that on-farm conditions are being simulated,” Dr Rogers emphasised.

“It is there for the industry, and we want more people to know about it.”

Previous studies

Traditionally, the unit has been used for pesticide registration efficacy studies to support permit applications. In the last five years, 37 trials have been conducted in the unit, including the successful permit application of Vivando® based on efficacy and residue trials.

Other highlights include:

- PCR disease diagnostic project (MU12007)
- Casing replacement and improvement trials
- Alternative nitrogen sources research
- Investigations into cold plasma treated irrigation water

- Compost supplementation trials
- Impact of calcium on mushroom whiteness trials
- Impact of CO₂ concentration on flush timing, yield and quality

Current and planned trials

Collaborations are currently underway with researchers from around Australia. These include digitally monitoring compost moisture, evaluation of nitrogen forms under the casing layer, and the novel work of Dr Kertesz that is investigating nutrient seeding and its potential to fortify the nutritional value of mushrooms.

Dr Kertesz's team is also evaluating the impact of different substrates on microbial populations during the spawn run.

The *Pest and Disease project* team Judy Allen and Warwick Gill run regular spot sanitiser treatment trials in the unit, and a further project is working to establish threshold levels of potential compost contaminants (e.g., pesticide residues) that find their way into the edible part of the mushrooms.

The unit will also soon welcome Dr Aimee McKinnon from Agriculture Victoria as she commences evaluations into non-synthetic (biological) controls for the mushroom industry.

Transitioning to a new facility

The current unit is situated on prime university real estate in the middle of the university's inner city campus and, unsurprisingly, is under some pressure.

A move would provide an opportunity to grow and modernise the facility, with current plans including four growing rooms with a 5-tonne capacity, fitted out with Dutch shelves, a rack system, and an industry standard environmental control system.

A new site, potentially further out of the city towards the new Western Sydney Airport Precinct, could also host a compost research facility to research Phase I, II and III compost.

The world standard design would include Phase I bunkers and Phase II/III tunnels, with full pasteurisation spawn run facilities including heating elements in the walls of the Phase II/III tunnels to maintain temperature.



Dr Ralph Noble discussing trials with Meghann Thai and student Juno Bennet.



The unit currently sits on prime real estate in the middle of The University of Sydney's main Darlington campus

Get involved

The Marsh Lawson Mushroom Research Unit is available to the industry for research projects and small proof-of-concept trials.

The team of researchers and technicians can tailor support packages to your needs, including trial designs, growing and harvesting, treatment applications, data collection, analytical services, and reporting.

For more information contact Umberto Calvo (umberto.calvo@ahr.com.au) or Adam Goldwater (adam.goldwater@ahr.com.au)

Hort Innovation
Strategic levy investment

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