



mushroom

INDUSTRY REPORT 08 • 09

A healthy outlook for the industry

The 2008/09 year will be remembered as the year of the global financial crisis and a time of great uncertainty for many people. Fortunately, the mushroom industry was well placed to weather the storm and although there have been definite and lasting impacts on the industry, such as reduced credit availability, most industry participants will have entered the new year with a degree of confidence and enthusiasm.

The strength and resilience of the industry can partly be attributed to the leadership shown by AMGA in ensuring that mushrooms continue to be strongly promoted and marketed to consumers as being critical for their health and wellbeing. This clear strategy was developed in consultation with all levy payers and has ensured that consumers increasingly see mushrooms as being a 'necessary' rather than discretionary purchase.

Importantly, the industry has resisted the urge to simply promote mushrooms and has instead taken the more strategic approach of building a groundswell of demand through informing and educating consumers.

The existing mushroom industry strategic plan is due to be renewed in 2010/11 and moves are already afoot to ensure that industry participants have an opportunity to provide input into the plan. Stay tuned and look out for notification of these opportunities from AMGA. Your feedback on the industry strategy is extremely important as the strategy will be used to guide the investment program over the next five years.

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Climate Change is increasingly becoming a significant topic for the horticulture industry. In 2007/08 the industry began contributing to the horticulture component of Phase One of the national Climate Change Research Strategy for Primary Industries (CCRSPi).

The aim of CCRSPi Phase One was to develop a comprehensive research strategy that will allow industries to be informed by good research and be prepared to respond to the opportunities and risks presented by climate change. The scope of the strategy will be broad, covering any issue that needs consideration over the short (3 years), medium (5+ years) and long term (10+ years). The research strategy and Phase One final report is available from the CCRSPi website <http://lwa.gov.au/ccrspi/>.

HAL is now contributing to Phase Two of the project in 2008/09 in collaboration with other Rural RDCs, CSIRO and Federal, State and Territory Governments. This phase aims to develop an implementation plan for the research strategy for 2009/10 onwards.





Health portfolio research

This co-ordinated portfolio of research includes studies at the University of Western Sydney (UWS) into the nutritional and therapeutic values of *Agaricus bisporus* and the various components of the *Mushrooms for Life* programme.

Vitamin B12 is essential in the human diet and deficiency can lead to impaired immunity as well as other clinical manifestations, such as metabolic, haematological, cardiovascular and neuropsychiatric disorders. Segments of the population especially at risk include the elderly, vegans and their infants.

Meat and dairy products are the major dietary sources of Vitamin B12, while the UWS study has demonstrated that mushrooms can also provide a valuable source.

Analysis of cultivated mushrooms from five farms in three Australian states showed Vitamin B12 to be present in all samples, with higher amounts concentrated in the peel than in the cap or stalk. Vitamin B12 was present in samples obtained from all flushes of button, cup and flat mushrooms. There were variations in vitamin B12 content of mushrooms from different farms.

Mushroom samples were also obtained from three major supermarket stores and the Vitamin B12 concentrations were comparable with the levels found in mushrooms direct from the farms.

Another UWS study using diabetic rats showed that feeding powdered *A. bisporus* mushrooms lowered blood glucose and triglycerides concentrations. Diabetic rats receiving the mushroom powder also had lower liver weights than the controls, which is associated with a normal liver function. This suggests that the inclusion of powdered mushrooms in the diet may protect diabetic rats from chemically induced liver injury.

A parallel study with rats also demonstrated that those receiving mushroom powder in their diet had significantly lower concentrations of total blood cholesterol and LDL, whereas HDL concentration (the good cholesterol) was increased.

Mushrooms for Life

The *Mushrooms for Life* component of the Health Portfolio research continues to research, review and access scientific publications relating to the health,

nutritional and therapeutic benefits of *Agaricus bisporus*. The information has been consolidated into specific topic areas and made available through a range of communication options.

The *Mushrooms for Life* website (www.mushroomsforlife.net) is regularly updated, especially regarding the latest science on mushrooms, health and nutrition. Website enquiries have included questions on selenium, uric acid, heavy metals, glutamate and Vitamin B12 in mushrooms. AMGA members have also requested information on food labelling, nutrient claims, mushroom packaging, and the risk of mushroom allergy.

The website attracts 14,000 hits per month with the most viewed sections being the importance of mushrooms in the science of health and nutrition, fact sheets and Frequently Asked Questions.

Continuous reviewing of research publications from around the world enables the project team to advise the Australian industry of developments that can be prepared into formats for media release. Recent information indicating that mushrooms in the diet of Chinese women reduced the risk of breast cancer by more than 60 per cent gained widespread coverage in the Australian media, reaching well over 2 million people. There was similar coverage with media releases reporting US research on the ability of mushrooms to protect against influenza.



Mushrooms for Life website
www.mushroomsforlife.net

Observable benefits to the mushroom industry of *Mushrooms for Life* activities have been:

- greater efficiency in disseminating information
- a better informed supply chain, from compost maker to retailer
- better information for the media, providing health and nutrition data about mushrooms
- better informed scientists and health professionals working in the field of human health and nutrition
- an effective link to international scientists conducting mushroom research.

Project MU06023

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Breast and prostate cancer research with mushrooms continues

Dr Shiuan Chen and his team at the Beckman Research Institute of the City of Hope Hospital in California are making slow progress with trials using mushrooms as a deterrent to human breast and prostate cancer.

The present research, funded by the Australian and United States mushroom industries, builds on previous work at the Institute in which significant anti-cancer benefits were recorded when *Agaricus* mushrooms were fed to nude mice.

Clinical trials are underway with the breast cancer trial although recruitment has been very slow. Patient surveys have determined that mushroom powder tablets are the preferred method of administration of the medication. Unfortunately one of the patients on the high dose treatment had an allergic reaction to the mushroom tablets and further recruitment was suspended until the Internal Review Board (IRB) was satisfied that further problems were unlikely to be encountered with this treatment.

Recruitment has recommenced and there have been no further allergic responses.

Allergies to mushrooms do occur from time to time but they are rare. The allergy suspension and previous delays and the slow recruitment process means this project is now running about a year behind schedule.

The prostate cancer trial is now underway after some delays in gaining IRB approval. Recruitment has also been slower than anticipated. Meanwhile, the repeated nude mouse experiments with the new mushroom powder preparation proved to be very rewarding with confirmation of the previous published findings in a very positive manner.

A videoconference was held between the Mushroom Industry Advisory Committee located in Melbourne and the research teams located at the City of Hope Hospital in California to strengthen the relationship between the investors and the implementers.

Project MU06019

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Information is power

Establishing a strong foundation of statistics and data may not seem like the most important task in the world and yet without a good information base it is possible to make ill-informed decisions that can cost your business thousands.

Fortunately, the mushroom industry is regarded as having some of the best data in horticulture.

AMGA has had a great commitment to the collection of statistics from and for the industry over a long period of time. This information enables the industry to make decisions confidently and then to measure the benefits of the industry's investments. Through this project, AMGA is able to monitor production volume and cost, import and export figures, pricing and sales volumes, population growth, per capita consumption and a range of other variables.

The project also allows the industry to monitor the media for any items of 'risk' that may impact the industry, such as environmental or food safety issues, and is therefore an important input into the industry's risk management program, AMSafe.

Recently the industry has been able to use cost of production data to inform the discussion around the new Horticulture Award. Without this information it is very difficult to adequately represent the industry's position to its stakeholders. If an outcome of the discussions is that the new award does not increase the cost of production to mushroom businesses, then this in itself would represent a handsome return on investment.

Project MU08011

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Industry journal

The AMGA Journal, produced on a quarterly basis, has long been an integral component of the industry's communications and is likely to remain so.

It allows industry participants to stay in touch with domestic and international developments in the mushroom industry as well as providing regular detailed reports on the outcomes of the industry's investments in R&D and Marketing programs.

This year the Journal was printed in colour allowing photographs to be used to greater effect in telling the mushroom story.

In 2008/09 the journal covered a plethora of topics ranging from:

production and management issues; OH&S; columns from the Pest and Disease Management Service; developments in the international mushroom industry and outcomes from the industry's investments in R&D and marketing programs; and regular columns from the AMGA Chair and General Manager.

The Journal is edited by Judy Allan in consultation with Greg Seymour and a small Journal committee.

Project MU07003

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Industry testing of mushroom disease monitoring system

The state-of-the-art, genetically-based mushroom disease monitoring system has now reached the pilot study phase with industry.

Using the expertise of scientists in Australia, New Zealand and South Africa, along with inputs from those in the United States, The Netherlands and Ireland, the project has developed genetic profiles that will be used to identify major mushroom diseases. The targeted diseases are *Verticillium*, (dry bubble), *Trichoderma*, (green mould), *Mycogone* (dry bubble), *Cladobotryum* (cobweb), La France virus and mushroom bacilliform virus.

Previous methods for detection and identification of the disease-causing pathogens have involved initial isolation of the pathogen into culture prior to subsequent morphological identification. This traditional system is slow and can be unreliable.

The genetically-based identification methods developed in this multi-agency project are rapid, accurate and have the potential to detect pathogenic material on the farm before disease symptoms appear on the crop.

During this phase of the project, pilot studies are being run in Australia, New Zealand and South Africa with samples taken regularly from farms and tested for diseases at research laboratories in Melbourne, Christchurch and Pretoria respectively.

Samples are being collected from many locations on the farms including growing beds, run-off water, tools and equipment, air filters, growing room walls/doors, outside surfaces and air.

Detailed records of each sample and the subsequent analyses will be built into a comprehensive database for use in monitoring disease development and providing management advice back to individual farmers.

In addition, the project continues the development of genetically-based tools for use in determining the quantity of each pathogen detected in the samples. Pathogen quantification, related to subsequent disease development on the farm, will provide even more accurate indications of the most useful management options for disease control.

Another part of the project continues the screening of pathogen isolates for fungicide resistance. Again, using genetically-based systems, it will be possible to readily screen samples from farms to determine if they are resistant to specific fungicides.

Another important outcome from this internationally supported project is the move to establish two global collections of all known mushroom pathogens. These will be located at the University of Pretoria in South Africa and at the Wageningen University and Research Centre in The Netherlands. National collections will also be maintained, but the two global collections will allow international researchers to readily access samples of pathogens from any part of the world.

Project MU07000

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Accurate identification is essential with fungal disease vectors

Verticillium (dry bubble) disease of mushrooms can be vectored in and around mushroom farms by mushroom sciarids (*Lycoriella ingenua* and *Bradysia ocellaris*) and phorids (*Megaselia hatherata*). The vectors are able to transport fungal spores to growing shed locations with optimal conditions for germination and to areas with minimal fungicide protection.

Initial assessment of vector trials using sciarids and phorids to transfer *Verticillium* spores to mushroom growing crates resulted in comparable levels of disease development to when fungal spores were transferred directly.

Verticillium spore loads carried by the two vector sciarids were determined by exposing the sciarids to infected mushrooms and then transferring them

individually onto nutrient agar plates for periods of up to one hour. The sciarids were then removed, the agar plates incubated and fungal colonies identified and counted.

Under controlled conditions one sciarid vector, (*B. ocellaris*) transported more *Verticillium* spores from infected to sterile culture plates than the other sciarid vector (*L. ingenua*). Similar results were obtained when these vectors were collected from a growing room infected with *Verticillium* and transferred to sterile plates.

This difference in efficiency of vectoring *Verticillium* spores makes it imperative that growers are able to accurately distinguish between different sciarids.

A comparison of the time at which *Verticillium*-carrying sciarids were introduced into caged mushroom growing

crates showed that introduction at casing resulted in significantly higher disease incidence than when infected sciarids were introduced to fresh air.

The application of manganese prochloraz (Octave) as a watered-on treatment to the casing resulted in significantly reduced disease incidence in growing crates infested by *L. ingenua* sciarids. This treatment was more effective than applications of manganese prochloraz onto the casing layer at fresh air and after the first flush.

Project MU06021

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Evaluation of chemicals at Marsh Lawson Mushroom Research Unit (MLMRU)

This on-going project is designed to support continued access by mushroom growers to pesticide products that will assist in the sustainable management of pest and disease problems.

Abamectin (Wizard®) has been evaluated for effectiveness against mushroom mites and saprophytic nematodes. It was selected as a low toxicity alternative for the organophosphate insecticide diazinon, as well as an alternative to the nematicide fenamiphos (Nemacur®). Results from residue trial analyses are very promising and efficacy work has shown that abamectin is very active against mushroom mites.

Research has continued with the fungicide imazalil (Magnate®) as a treatment against green mould, *Trichoderma* species. Three application methods are being evaluated: as a spawn treatment; incorporated into the casing layer; and watering onto the casing layer between flushes. Again, analyses have revealed very acceptable residue levels and, while efficacy data will be required prior to registration being approved, interim discussions are taking place with the Australian Pesticides and Veterinary Medicines Authority (APVMA) to seek the issuing of permits prior to full registration.



Watering on imazalil fungicide as an aqueous solution at fresh air. A crate with the bottom removed is used to provide a barrier minimising contamination.

Different application schedules with Manganese (Mn) prochloraz (Octave®) are being evaluated for use of the chemical against *Verticillium* and cobweb. The schedules are: incorporation into the casing at full rate; incorporation into the casing at half rate followed by watering on at half rate at the first flush (split application); and a watered on split application

(first application at fresh air and the second after the first flush).

Project MU06013

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Mushroom Industry Annual Conference

The Australian Mushroom Industry Conference was held in October 2008 in Melbourne, Victoria. It is the highlight of the information transfer calendar for the industry. International and domestic keynote speakers were invited to present the latest information on key issues to a large audience of industry members. A presentation of current levy-funded projects was also provided as part of the program during the annual levy payers meeting.

The aim of this project was to inform growers of the latest advances in mushroom production and marketing in Australia and from around the world. The issues that were addressed included: pest and disease management; dry versus irrigated straw for use in compost making; industrial relations;

retaining staff; and a major presentation on *Trichoderma*, one of the major disease issues for the industry. Growers benefited from the ongoing networking opportunities with their peers, presenters and suppliers. The industry benefited through increased knowledge of the latest advances in mushroom production and disease control, which will lead to more efficient production and effective marketing. Reports were also provided on the ISMS Congress in Cape Town and the Study Tour to South Africa.

The 2008 Conference was the 35th consecutive industry forum and forms an important part of the industry's technology transfer program. The latest in technology from around the world to the industry was on show for delegates. International collaboration still plays a critical role in the

technical support of our industry as the Australian industry lacks the size and critical mass to sustain an independent professional technical support service. Therefore attendance at international conferences/congresses, meetings and study tours of the mushroom industry in other countries are important activities for functional and beneficial networks.

The development of personal links with R&D and marketing and promotions organisations and, more importantly, the staff who are directly involved with mushrooms, are important investments for the future of the industry here in Australia.

Project MU07022

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Mushroom marketing

Consumer marketing program

Mushroom celebration functions occurred throughout September 2008. These functions provided the platform for the launch of the BBQ mushrooms campaign to the media and industry supporters. A radio advertising campaign in all capital cities informed consumers about the health benefits and usage ideas for mushrooms on the BBQ.

A promotion and competition also commenced in September via a new recipe leaflet and radio advertising. The new recipe leaflet was distributed to wholesalers, retailers, greengrocers and statutory levy payers, providing consumers with quick, easy and innovative ideas for using mushrooms.

Throughout the year a wide range of below-the-line and PR activities to promote fresh mushrooms were undertaken in each state by AMGA State Promotions Coordinators. A good coverage of the activities to provide consumers with information and ideas for the use of mushrooms can be found on the levy payers website www.mushroomlevy.com.au

The cookbook, *Mushrooms – the great all-rounder*, continues to be a huge hit with consumers and the media. Consumer research reports 46 per cent of Australians use mushrooms according to a recipe. The book provides over 100 everyday mushroom meals that support the industry's strategy of putting quick, easy, and innovative usage ideas in the hands of the consumers.

The Mushroom Lovers Club is also part of our usage support strategy and now boasts over 20,000 members. Recipes are sent on a regular basis to consumers who have requested the service. This group also provide important feedback from time to time.

Food service marketing program

The Mushroom Mania food service promotion (MM) during June 2009 was a great success with over 1,800 restaurants participating nationally – a new record. MM aims to increase the amount of mushrooms (primarily Agaricus) consumed at a range of food service establishments in the dining sector around Australia throughout June and beyond the campaign period.

Chefs in local areas throughout Australia were encouraged to feature mushrooms on their menus via a telemarketing and internet campaign. Consumers were encouraged to eat out at participating restaurants via a national radio campaign that drove potential diners to the MM website www.mushroommania.com.au and then on to participating dining establishments listed on the website and those that were offering special MM deals.

While the number of participating establishments was at record highs, the hits recorded on the MM website during the campaign from diners were down from the previous year. Feedback from participants about the success of the promotion was positive particularly in a year where the global financial crisis had quite a negative impact on the dining sector.

A new food service initiative for 2009 was the farm tour program for chefs and apprentices. These ran in all states and were booked out very quickly and received wide acclaim from participants. Feedback indicates demand will be strong again in 2010 with chefs already reserving places.

A special farm tour was organised to Bulla Mushrooms in Victoria for finalists



Electrolux Appetite for Excellence

in the Electrolux Appetite for Excellence program. The visit had a lasting impression on many of the young people who were able to clearly recall the key points about mushrooms in food service during discussion at the Awards Presentation night held in Sydney.

Retail marketing program

Mushroom Madness is highlight of the industry's retail promotional program. A major radio advertising campaign during March informed consumers about mushrooms and told them about a consumer competition at the Mushroom Madness website www.mushroommadness.com.au

Part of the campaign advertised the winners of the Mushroom Retailer of the Year competition and encouraged consumers to visit those stores to check out the offer. The presentation of the winners Awards occurred in each winner's store to publicly recognise the staff, who actually do the work, in front of their customers and media.

A new initiative this year was the introduction of the retailer development program where trained industry staff visited the top 50 independent retailers in each state. The program provides technical and collateral support to encourage the very best point of sale performance and promote customer education about the benefits of including mushrooms regularly in their diet.

A retail promotion at Coles Supermarkets ran in the lead up to Christmas with an advertisement in the Coles Christmas catalogue. The ad highlighted some Christmas usage ideas for mushrooms and encouraged consumers to visit a dedicated website for more innovative and traditional ideas www.mushroomsatxmas.com.au





The mushroom industry supported an exhibit manned by grower/suppliers at the IGA Expo on the Gold Coast in July to encourage a wider range of mushrooms to be stocked in IGA supermarkets.



One of the winners of the Mushroom Retailer of the Year Awards, Forestway Fresh in Terry Hills, NSW

The highly successful recipe leaflet program continued with green grocers. Two new leaflets were produced in 2008/09. Over one million leaflets were distributed in March and September. In support of the leaflets, two media releases were circulated to all media outlets nationally with strong uptake particularly in the regional press.

The www.cookingwithmushrooms.com website continues to be popular with consumers with over 4 million hits for the year.

Project MU08500

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AMSafe

The long-term success of the industry in securing, safeguarding and growing valuable local and international markets relies on the industry's commitment to product integrity and quality.

This commitment is reflected in the industry's capacity to rapidly identify and effectively respond to potential or actual problems that may result in crisis situations. In turn, this response capability ensures that the industry will maintain its sound 'through-chain' reputation of producing quality mushroom products.

The Australian Mushroom Industry's crisis Management Plan, AMSafe, provides the management system and guidelines for preparing for, responding to, and recovering from crisis situations that could possibly affect the industry, both domestically and internationally.

The plan complements existing emergency response plans held by individual organisations, HAL and Commonwealth, State and Territory Governments.

AMSafe is managed by an authorised committee that makes decisions about crisis management on behalf of the industry. There are designated alternatives for Committee members. AMGA is the secretariat of AMSafe and the custodian of the plan.

In 2007/08 consulting group Edelman P/L provided an independent review of the AMSafe plan and the preparedness of AMGA to support the AMSafe Committee. A positive report was received. The project manual and procedures were updated and redistributed as part of the normal process during 2008/09.

Project MU08012

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International mushroom industry collaboration

The future strategic underpinning and technical support of the Australian mushroom industry is highly dependent on international collaboration. The Australian industry lacks the size, critical mass, and financial resources to sustain the professional technical support services required for a successful industry.

The Mushroom Industry Strategic Plan 2006–2011 highlights the need to establish and maintain international networks for R&D and marketing, and to ensure the industry is equipped with the necessary skills, resources and structures to facilitate international co-operative R&D and marketing projects.

This voluntary levy project enabled travel to review the management of the industry's Mushrooms and Health portfolio in the USA and maintain global support for the Mushrooms & Health Global Initiative (M&HGI) from UK and European industries. A meeting of key mushroom marketers from Europe and North America was also attended in Dublin, and meetings with industry leaders in relation to the 2009 Australian Mushroom Conference were held at the Mushroom Days Exhibition in Den Bosch, Holland.

The Australian industry will benefit through collaboration with other countries on a number of new international R&D projects that are essential for our strategic future. These

projects include: the breast and prostate cancer clinical trials with agaricus mushrooms at City of Hope Hospital in California; the ergothionine antioxidant work at Penn State University; the mushrooms and weight management research at Johns Hopkins Hospital in Baltimore; and the agaricus mushrooms and human immune system work at Tufts University in Boston.

In addition to the new projects above, this project has enabled the Mushroom Disease Diagnostic project (MU07000) to be expanded into a global project with additional collaborators in the Netherlands, South Africa, Ireland, and USA. The Mushrooms & Health Global Initiative that was originally funded by USA and Australia now has additional financial support from Canada, the Netherlands, France, Spain, Belgium, Italy, Poland, Germany, Denmark, UK and Ireland.

In addition to the benefits to the R&D program, collaboration with many industry and private mushroom marketers and PR people from around the globe has enabled many good ideas to be incorporated into our Australian marketing and promotions programs.

Project MU07004

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Pest and Disease Service

The industry's Pest and Disease Management Service (PDMS) consists of several interrelated strategic activities that underpin the production security for the industry. Mushroom farms need effective pest and disease management to prevent negative effects on their yields, quality and costs of production. PDMS activities have included: delivering training courses; publishing pest and disease articles in each quarterly issues of the AMGA Journal; responding to farm enquiries; and reviewing and updating the knowledge base on Agora, the web-based pest and disease service.

A series of training courses titled *Disease & pest recognition and spot treatment techniques* was delivered to approximately 70 people representing 30 farms in Victoria, NSW, Queensland and South Australia.

Reference specimens of sciarid and phorid flies were distributed to help growers better differentiate the most common mushroom fly species present in their farms so they can select the most effective control measures for the species present. This initiative was in direct response to the finding in previous PDMS surveys that generally farms have not been able to differentiate the fly species and therefore

were not always using the most effective treatment.

Sets of photos were made available to farmers on request to use in on-farm training for recognising diseases. Suggestions were also made about how to upgrade training and spot treatment procedures. Some of the photographs were selected specifically because they showed the diseases in situ as they appear on the growing bed and at the size they should be observed.

The following articles were published in the PDMS column of the AMGA Journal:

- Pesticide update
- List of Australian papers presented on the subject of pest and disease at the ISMS congress in South Africa May 2008
- What to do if you have orange cecids
- Internal stalk necrosis
- Additives used in irrigation water
- Results of mini survey for virus status
- Virus testing service
- Organic pesticides suitable for use in the Australian mushroom industry

- Permit/registration process for chemicals used by the mushroom industry
- Cinnamon mould
- High water temperature can lead to mushroom disorders.

Additional information has been written and uploaded into the Agora knowledge base. Last year there were 154 separate logins into Agora and this year there were 216. The number of users remained similar at 31. When pest and disease telephone enquiries were received, growers were often referred back to written information on the specific problem that resides in the Agora knowledge base.

Approximately 40 pest and disease enquiries were received during the year and expert advice and recommendations given. The topics ranged from disinfectant and pesticide selection and rates, water additives against bacterial disease, Cobweb control, Verticillium control, Trichoderma control, fly identification and control, orange cecids, mites and weed moulds.

Project MU08013

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Quantifying environmental credentials of the Australian mushroom industry

Domestically and overseas, agriculture is increasingly affected by community concerns regarding the environment. The effects are both direct and indirect, and take the form of regulation, market requirements and 'expectations' on the part of the general public.

With the support of HAL, AMGA commissioned Tasmanian Quality Assured Inc (TQA) to prepare a preliminary document outlining how these factors may impact on the Australian mushroom growing industry, and identifying any gaps in knowledge or practice with regard to environmental management.

A SWOT analysis (strengths, weaknesses, opportunities, threats) of the industry with respect to the environment identified the industry's Environmental Management System; a Code of Practice

for composting; and limited exposure to the export market as strengths. The environmentally-friendly perception held by many stakeholders was due mainly to the industry's excellent recycling and waste management credentials.

The key concerns related to the cost and use of energy (carbon footprint) and the management of odour and waste water in the composting process. The industry has largely overcome these issues in the past decade with most compost operations now at world's best practice.

The biggest threats to the industry come from concerns about the availability, quality and cost of inputs such as straw, peat, transport and the potential environmental demands in the supply chain by retailers. In response the industry has proposed an international panel to discuss peat availability at the 2009 Annual Conference,

established a straw availability committee, and undertaken to scope a carbon footprint project for action in 2010.

A report and recommendation on the carbon footprint project will be presented by Peter Deuter, Senior Principal Horticulturist, Queensland Primary Industries and Fisheries. Peter has done similar work for the Australian vegetable industry and will be working with mushroom grower Neil Newman of Newman Venture at Stanthorpe in Queensland to establish a meaningful protocol for measuring the carbon footprint of a mushroom enterprise.

Project MU08007

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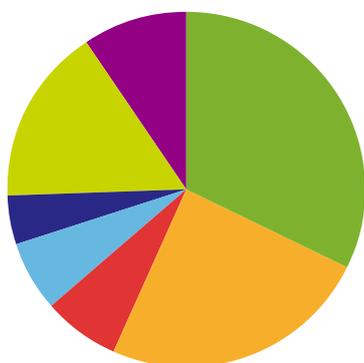
Investing in Australian horticulture

Australian Government priorities

As part of the Australian Government's commitment to rural research and development, horticulture industries can access matching Commonwealth funding through HAL for all research and development activities.

The Australian Government's Rural Research and Development Priorities aim to foster innovation and guide R&D effort in the face of continuing economic, environmental and social change. HAL's operations are closely aligned with these priorities.

This chart shows the proportion of projects in HAL's mushroom R&D program against each of the Australian Government priorities for rural research and development. Full details across all industries are available in HAL's annual report at www.horticulture.com.au



- Productivity and Adding Value (32.3%)
- Supply Chain and Markets (24.5%)
- Natural Resources Management (6.8%)
- Climate Variability and Climate Change (6.4%)
- Biosecurity (4.5%)
- Innovation Skills (16.1%)
- Technology (9.3%)

Productivity and Adding Value

Improve the productivity and profitability of existing industries and support the development of viable new industries.

Supply Chain and Markets

Better understand and respond to domestic and international market and consumer requirements and improve the flow of such information through the whole supply chain, including to consumers.

Natural Resource Management

Support effective management of Australia's natural resources to ensure primary industries are both economically and environmentally sustainable.

Climate Variability and Climate Change

Build resilience to climate variability and adapt to and mitigate the effects of climate change.

Biosecurity

Protect Australia's community, primary industries and environment from biosecurity threats.

Innovation Skills

Improve the skills to undertake research and apply its findings.

Technology

Promote the development of new and existing technologies.

Relationships and roles relating to HAL programs

Horticulture Australia Limited (HAL) is a not-for-profit industry owned company. Its role is to manage the expenditure of funds collected by the Australian Government on behalf of horticulture industries.

HAL invests \$85 million annually in projects to benefit horticulture industries.

An Industry Advisory Committee (IAC) is established for each industry with a statutory levy and annual income exceeding \$150,000. The IAC is a subcommittee of the HAL Board. It makes recommendations to HAL on the expenditure of funds.

The Australian Mushroom Growers Association recommends membership of the IAC to HAL and ensures the skills required on an IAC are met by the persons they recommend for appointment to the committee. The Australian Mushroom Growers Association is responsible for recommending to HAL the establishment of, and any changes to, statutory levies.

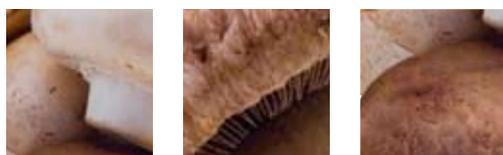
For more information please visit www.horticulture.com.au

In 2008/09 the Australian Mushroom Growers Association acted as the service provider on 23 projects.

Full details can be found on page 11 of this report.

Consultation funding

Consultation funding is paid by HAL to cover costs for IAC meetings, annual levy payers' meetings and costs within the partnership agreement between HAL and the member industry that are specified as consultation, for example R&D program consultation. In 2008/09 \$184,830 of consultation funding was budgeted to be provided to the Australian Mushroom Growers Association.





Across Industry Program

The mushroom industry contributes funding towards an across industry program that addresses issues affecting all of horticulture. Details of the current program are listed below. A full report of the program can be found at www.horticulture.com.au/industry/acrossindustry.asp.

Project No	Project title	Levy or VC	Project start	Project completion	Organisation	Contact
Objective 1: Enhance the efficiency, transparency, responsiveness and integrity of the supply chain						
AH07021	Management of risks in the horticultural industry	Levy	1 Oct 07	30 May 08	Horticulture Australia Limited	Richard Bennett 02 8295 2300
AH07033	Incident Response Protocol – development and training for horticulture	Levy	21 Apr 08	30 Sep 09	Control Risks	Julian Heath 02 9279 0099
AH08011	A baseline survey of knowledge, attitudes, approaches and aspirations regarding contamination management	Levy	31 Jul 08	31 May 09	Instinct and Reason	David Donnelly 02 9283 2233
AH08012	Country of Origin labelling research project	Levy	1 Oct 08	31 Oct 08	Horticulture Australia Limited	David Chenu 02 8295 2300
Objective 2: Maximise the health benefits of horticulture products						
AH07006	Promoting the health advantage of fruit and vegetable to increase their consumption	Levy	1 Jul 07	30 Jun 10	Horticulture Australia Limited	Chris Rowley 02 8901 0329
AH07007	Horticulture Wellbeing Initiative	Levy	27 Jun 08	31 Jul 09	Horticulture Australia Limited	Chris Rowley 02 8901 0329
Objective 3: Position horticulture to compete in a globalised environment						
AH06012	Evaluation strategies for varieties derived from Australian breeding projects or imported varieties	Levy	30 May 07	31 May 08	Diversity Arrays Technology Pty Ltd	Dr Andrzej Kilian 02 6281 8514
AH07001	Establish the horticulture statistics database on-line analysis capability	Levy	25 Jun 08	31 Mar 09	Bureau of Rural Sciences	Dirk Platzen 02 6272 4282
AH07002	HAL market access coordination	Levy	1 Jul 07	1 Oct 09	Horticulture Australia Limited	Wayne Prowse 02 8295 2300
AH07003	Market access support program (follows project AH05034)	Levy	30 Jun 08	1 Oct 09	Horticulture Australia Limited	Wayne Prowse 02 8295 2300
AH07017	Codex committee on fresh fruit and vegetables participation	Levy	1 Jul 07	30 May 08	Horticulture Australia Limited	Richard Bennett 02 8295 2300
AH08010	Workshop on quantitative methods applied to horticultural improvement	Levy/ VC	16 Jul 08	30 Sep 08	Australian Crop Genetic Services Pty Ltd	Craig Hardner 07 3346 9465
HG08061	Market access R&D support service		1 Jul 08	1 Oct 09	Kalang Consultants	Rob Duthie 0422 905 787
Objective 4: Achieve long term viability and sustainability for Australian horticulture						
AH04007	Pesticide regulation coordinator	Levy	5 Jul 04	31 Jul 09	AKC Consulting Pty Ltd	Kevin Bodnaruk 02 9499 3833
AH06007	Industry involvement in the development of primary production and processing standards	Levy	5 Dec 06	29 May 09	Horticulture Australia Limited	Richard Bennett 02 8295 2300
AH06019	Australian horticulture's response to climate change and climate variability	Levy/ VC	1 Jul 06	31 Dec 08	Queensland Primary Industries and Fisheries	Peter Deuter 07 5466 2233
AH07026	The current and future human resource needs of Australian agriculture	Levy	5 May 08	31 May 09	Australian Farm Institute Ltd	Mick Keogh 02 9690 1388
AH07031	Peri-urban horticulture and land use planning: Literature review & 'tool-kit'	Levy	1 Apr 08	31 Oct 08	GHD	Luke Jewell 02 9241 5655
AH07032	Independent quarantine and biosecurity review	Levy	1 Apr 08	15 Jun 08	Horticulture Australia Limited	Kim James 08 6389 1407
AH08002	Horticulture Water Initiative 08/09	Levy	1 Jul 08	30 Jun 09	RM Consulting Group	Dr Anne-Marie Boland 03 9882 2670
AH08003	Analysis of Horticulture's carbon footprint	Levy	20 Feb 09	23 Oct 09	Horticulture Australia Limited	Alison Turnbull 02 8295 2300
AH08014	Horticulture industry consultation on Award modernisation	Levy	17 Nov 08	30 Nov 09	Horticulture Australia Limited	Warwick Scherf 02 8295 2300
AH08019	Access to the Invasive Species Compendium for the Australian horticultural industry	Levy	1 May 09	31 May 10	Horticulture Australia Limited	Kim James 08 6389 1407
MT07029	Managing pesticide access in horticulture	Levy	1 Jul 07	30 Jun 10	AgAware Consulting Pty Ltd	Peter Dal Santo 03 5439 5916

Mushroom Program 2008/09

Project No	Project title	Levy or VC	Project start	Project completion	Organisation	Contact
MT08015	Data collection program	Levy/VC	15 Sep 08	31 May 10	Horticulture Australia Limited	Roger Bramble 02 8295 2300
MU06013	Facilitation of new/existing products for the mushroom industry	Levy	1 Aug 06	30 May 09	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU06019	Mushrooms and breast/prostate cancer research	VC	1 Jun 07	15 May 11	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU06021	Managing vector transmitted fungal diseases of cultivated mushrooms	VC	31 May 07	30 Sep 10	The University of Sydney	Afsheen Shamshad 02 9351 2938
MU06023	Mushrooms and health research portfolio	Levy/VC	29 Jun 07	30 Sep 11	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07000	Development of a disease monitoring system for the Australian mushroom industry	Levy/VC	1 Jul 07	30 Dec 09	Australian Mushroom Growers Association	Tony Biggs 02 4571 1321
MU07003	Facilitation of information transfer to the mushroom industry through AMGA Journal	VC	31 Jul 07	30 Sep 11	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07004	International mushroom industry collaboration	VC	1 Jul 07	23 Dec 08	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07014	Investigate effectiveness of mushroom substitution for high energy density foods on weight loss and health measures	VC	1 Apr 08	30 Nov 10	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07015	Beneficial effects of five commonly consumed whole mushrooms and key bioactive agent	VC	30 Apr 08	1 Feb 10	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07016	Effect of mushroom supplementation on resistance to influenza infection	VC	1 May 08	1 Aug 10	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07017	Human intake of ergothioneine in mushrooms and effects on bioavailability, antioxidant capacity and inflammation biomarkers	VC	30 Apr 08	31 Jan 10	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07018	Postharvest Vitamin D enrichment of fresh mushrooms	VC	20 Jun 08	16 Dec 09	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07019	ISMS Congress/Diagnostic Workshop, South Africa, May 2008	VC	24 Apr 08	30 Sep 08	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU07021	Investigation of protective health benefits of selected species of mushroom in relation to Alzheimer's disease	VC	1 May 08	31 Aug 09	CSIRO Food and Nutritional Sciences	Louise Bennett
MU07022	Mushroom Industry Annual Conference, 2008	VC	30 Jun 08	30 Jan 09	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08005	Mushroom program management	Levy	1 Aug 08	31 May 11	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08007	Quantifying the environmental credentials of the mushroom industry – Phase 1	Levy	8 Aug 08	1 Dec 08	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08009	Facilitation of new/existing products for the mushroom industry	Levy	1 Jun 09	31 May 11	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08010	Mushroom industry communication plan	Levy	1 May 09	31 May 13	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08011	Mushroom industry statistics	Levy	1 May 09	31 Mar 14	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08012	Mushroom industry crisis management plan (AMSafe)	Levy	1 Apr 09	1 Apr 14	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08013	Pest and Disease Management Service (PDMS)	Levy	11 Mar 09	31 May 13	Consultant	Judy Allan 0427 671 057
MU08014	Review of current knowledge on mushroom worker's lung	Levy	1 Jan 09	31 Dec 09	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08015	Investigation of protective health benefits of selected species of mushroom in relation to Alzheimers disease	VC	15 Apr 09	30 Jun 10	CSIRO Food and Nutritional Sciences	Louise Bennett
MU08017	Attendance of the "Mushroom growing" and "Composting and tunnel management" seminars in the Netherlands	VC	1 Mar 09	15 May 09	CostaExchange Ltd	Hilton Rich-Bolwes 0407 310 800
MU08500	Mushroom marketing	Levy	1 Aug 08	30 Jun 09	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877
MU08900 /10	Mushroom Industry Partnership Agreement	Levy	1 Jul 08	10 Aug 11	Australian Mushroom Growers Association	Greg Seymour 02 4577 6877

Financial Report

Mushroom Investment Summary

Year ended 30 June 2009

	Marketing 2008/2009	R&D 2008/09	Combined 2008/09
Funds available 1 July 2008	749,834	245,440	995,274
INCOME			
Levies Received	1,693,868	564,623	2,258,491
Commonwealth Contributions		619,676	619,676
Other Income	17,811	21,720	39,531
Total Income	1,711,679	1,206,019	2,917,698
Budget	1,602,600	1,100,331	2,702,931
Variance to Budget	109,079	105,688	214,767
PROGRAM INVESTMENT			
Levy Programs	1,669,196	859,964	2,529,160
Service Delivery Programs by AMGA	20,072	230,822	250,894
Service Delivery Programs by HAL	36,896	148,565	185,461
Across Industry Funding		12,653	12,653
Levy Collection Costs	14,406	5,238	19,644
Total Investment	1,740,570	1,257,242	2,997,812
Budget	1,478,967	1,139,511	2,618,478
Variance to Budget	(261,603)	(117,731)	(379,334)
Annual Surplus/Deficit	(28,891)	(51,223)	(80,114)
Funds available 30 June 2009	720,943	194,217	915,160

Mushroom Industry Advisory Committee (IAC)

Bob Granger (Independent Chair)
 Richard Bell
 Matthew Fensom
 Kel Kilner
 Dr Barry J. Macauley
 Ian Pakes
 Doug Schirripa
 Mick SurrIDGE
 Kevin Tolson
 Greg Seymour (ex-officio)
 Lucy Keatinge (ex-officio)



FOR MORE INFORMATION CONTACT:



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