



RIRDC Honeybee R&D News is the official newsletter of the Rural Industries Research and Development Corporation Honeybee Program

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Chairman's Foreword

Des Cannon, Chairman

The new RIRDC Honeybee R&D Committee will take a more pro-active role in two areas where beekeeping in Australia is, or might be affected.

- In the event that *Varroa destructor* ever gains a foothold in Australia, we need to be able to quickly breed Varroa-resistant honeybee stock that can cope with the parasite. To this end we are looking at the feasibility of having some of our stock evaluated overseas for resistance to Varroa.
- We have in the past funded a number of projects looking at ways to promote the marketing of honey, either as a functional food or to emphasise the health benefits of honey. Projects in this area have

included assessing the glycaemic index (GI) of honey, the pre-biotic value of honey, the antioxidant components and levels in some Australian honeys, and the therapeutic qualities of Australian honeys.

The Research Committee held a 'Value-adding to Honey' workshop with some of our researchers. It was recognised that value-adding has not been effective recently in the marketing of Australian honey and that we need:

- standardised, repeatable, easy and inexpensive tests for each functional aspect of honey, and
- a standardised and recognisable scale for each function with which each

honey can be labelled at retail level, to assist the public in their choice of which honey to buy.

The R&D Committee will now look to further these initiatives over the course of the next few meetings.

For further information about the RIRDC Honeybee R&D Program, feel free to browse the RIRDC website (www.rirdc.gov.au) or contact the Program Co-ordinator, Lea Edwards, on 02 6271 4132, or email lea.edwards@rirdc.gov.au.

Current R&D Committee

| | |
|----------------------------|------------------|
| Des Cannon (Chair) | 02 6236 3294 |
| Dr Denis Anderson | 02 6246 4148 (w) |
| Prof Ben Oldroyd | 02 9351 7501 (w) |
| Bruce White | 02 9634 6792 |
| Research Manager | |
| David Dall | 02 6271 4128 |
| Program Coordinator | |
| Lea Edwards | 02 6271 4132 |

Marcus Oldham Rural Leadership Course 2009

The Marcus Oldham Rural Leadership Program Course is held at Marcus Oldham College (near Geelong, Victoria) and the RIRDC Honeybee R&D Committee has in the past sponsored one Australian beekeeper to attend this course each year. This year Stephen Davies, from Western Australia, was sponsored, and his report on the Course appears below.

"I begin by stating that the principal purpose for me in attending this course is that many in our industry in WA look to me to be a leader simply because I have been successful as a honey producer. But being successful in business has not necessarily prepared me to be an industry leader, and attending a leadership program such as the Marcus Oldham Leadership course has definitely placed me in a better position to be that industry leader.

Some of the major achievements for me personally through my attendance at the MORLP are the knowledge and experience I have gained in public speaking and also responding to the media. The setting of personal goals and understanding people management issues are two invaluable skills that I also learnt a great deal about in the week-long

residential course. I am sure that this knowledge and experience will in time be of particular benefit to me and I would sincerely hope also to the broader industry.

I have to also point out that the residential format of the course provided a great deal of opportunity to learn a considerable amount from the course participants' experiences, opinions and points of view, which helped to put a balance on the material being presented. Even more important than simply networking with the other course participants were the guest speakers; these presented a different topic every evening during dinner, which I felt was one of the keys to the success of the entire course.

I would strongly recommend more people within all agricultural industries attend this course with a particular focus on those people elected to higher profile positions such as AHBIC for example within the beekeeping industry. I fully support RIRDC providing scholarships for industry-minded individuals to attend this course, however these scholarships need to be more widely publicised to continue to attract high-quality candidates. Until I was asked by WA associates to apply for this course, I was not aware that it existed, let alone the immense value that I would get out of it."

Stephen Davies

Sponsorship applications for the Marcus Oldham Rural Leadership Course 2009

The RIRDC R&D Honeybee Committee has decided that, in future, the sponsored applicant will be chosen by a selection process. Applications for the RIRDC Sponsorship are now invited, and the application form can be obtained from Lea Edwards, the Honeybee Program Co-ordinator, by phoning 02 7271 4132, or by emailing Lea at lea.edwards@rirdc.gov.au. Applications close on 28 February, 2010.

The Committee will choose the successful candidate at its March 2010 meeting, and all applicants will be notified of the Committee's decision. The successful applicant's application will be forwarded to Marcus Oldham by RIRDC.

Any applicants who are unsuccessful in gaining sponsorship from the Honeybee R&D Committee are then free to apply to Marcus Oldham to participate in the course at their own cost. If you want to read more about the course, go to http://www.marcusoldham.vic.edu.au/htmls02_article/default.asp?nav_top_id=85&nav_cat_id=249



Feral hives?

Sydney University has provided major funding to examine the density of feral hives in the environment.



Feral bees in a bird box, South Australia

The Institute for Sustainable Solutions (University of Sydney) is funding the project. The project aims to develop a system for estimating the density of pollinators (particularly honeybees), without physically searching for nests, in disturbed and undisturbed Australian and south-east Asian landscapes. It will also allow the first quantitative estimates of the role of wild honeybees in pollination. The Behaviour and Genetics of Social Insects Laboratory (in the School of Biological Sciences), and the Ecosystem Modelling Group (in the Faculty of Agriculture and Natural Resources) are collaborating on the project.

Directly counting the number of bee colonies in the environment is not feasible because colonies are often difficult to



Feral bees

locate, and frequently they are too high above the ground to sample. Using genetic technology, the Social Insects Laboratory can examine the DNA from small, random samples of the drone bees in an area, and estimate the number of queens (colonies) contributing males to a population. If the sampling is done during the breeding season (in Australia, September to March), then virtually all colonies will be producing males.

Drones (or their daughters) will be sampled by:

- use of a drone trap held aloft by a helium balloon or long pole to directly sample males by attracting them with a sex pheromone lure;
- within a site, locating as many feral colonies as possible, and
- setting up 30 virgin queens in disposable mating nuclei and allowing them to mate. Three weeks later, the first worker brood will be sampled, and their DNA will be assayed for drone-derived genetic variation.

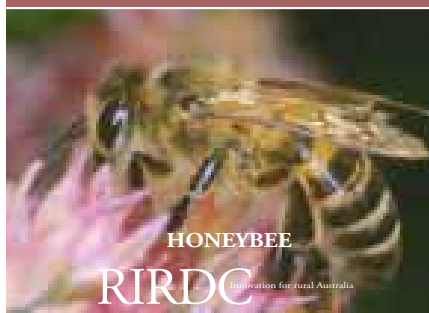
New RIRDC Honeybee Publications

All RIRDC publications can be purchased in hard copy online from www.rirdc.gov.au, or may be downloaded for free from the same site. Books can also be purchased by phoning 1300 634 313



RIRDC Completed Projects in 2008 - 2009
and Research in Progress as at June 2009

RIRDC Publication No. 09/103



Research in Progress - Honeybee Program 2008-09

RIRDC Pub. No: 09-103. Free from the web (www.rirdc.gov.au)

The goal of the Honeybee Program is to improve the productivity, sustainability and profitability of the Australian beekeeping industry through the organisation, funding and management of a research, development and extension program that is both stakeholder- and market-focused.

This Report contains an outline of research projects completed in 2008-2009, and also an outline of Research projects in progress in 2009-10, covering all the areas of the Honeybee Program. Broad Program objectives (and indicative investment weightings) are:

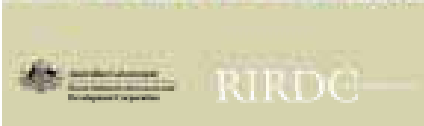
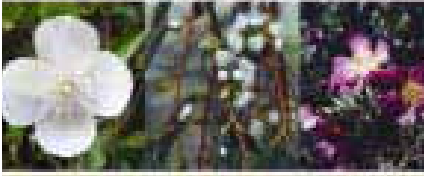
- **Pest and disease protection** – to be prepared for exotic pest and disease incursion before it occurs, to prevent the establishment of exotic pests and diseases of economic significance, and to control endemic pests and diseases that impact on beekeeper profitability. (45%)
- **Productivity and profitability enhancement to lift beekeeper income** – to encourage a culture of constant improvement in bee husbandry and management, to provide an across-the-board lift to industry productivity and profitability, and to focus productivity improvement on bee genetics, best management practices, beekeeper efficiencies and industry benchmarking. (15%)
- **Resource access security and knowledge** – to ensure ongoing access to native forests on public lands, to win back a share of native forest access lost in previous resource allocation decisions; to better understand the native floral resource on which the industry depends, and to address the implications of climate change on the Australian apiary industry. (10%)
- **Pollination research** – to better understand the cost and value of pollination services provided by beekeepers, and to generate industry value through shared learning with crop producers, especially the Australian almond industry. (10%)
- **Income diversification including new product development** – to provide a major boost to packaged bee sales, and to develop new Australian apiary products which represent secondary niche opportunities. (10%)
- **Extension, communication and capacity building** – to improve industry performance through the adoption of relevant R&D project outcomes and beekeeper participation in vocational training to educate the public and policy makers on the economic contribution made by the honeybee industry and to build capacity in the Australian honeybee industry by encouraging the next generation of industry leaders and researchers. (10%)

Program budget allocations are flexible and are guided by the Honeybee R&D Advisory Committee.



MERRY CHRISTMAS AND
A HAPPY NEW YEAR FROM
THE STAFF OF RIRDC AND
THE HONEYBEE R&D
ADVISORY COMMITTEE.

A Field Guide to Native Flora Used by Honeybees in Tasmania



A Field Guide to native Flora Used by Honeybees in Tasmania

M Leech. RIRDC Pub. No: 09-149

This pocket field guide is intended to provide a user-friendly tool for beekeepers to help identify Tasmanian native flora likely to be accessed by and beneficial to honeybees.

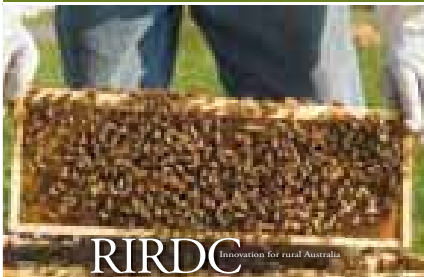
It is an essential element of a suite of products that describe Tasmania's honeybee industry and the floral resources accessed by honeybees.

The National Workshop on the Effects of Honey Bees on the Environment identified the need for each state to develop a beekeeping resource database to assist the beekeeping industry and relevant national and state government departments when determining beekeeper usage of government-controlled lands.



Biological Control of Chalkbrood by Anti-fungal Bacterial Symbionts of Bees

RIRDC Publication No. 09/120



Biological Control of Chalkbrood by Anti-fungal Symbionts of Bees

Murali Nayudu and Sheba Khan. RIRDC Pub. No: 09-120

Protecting apiaries from disease is an essential part of commercial beekeeping. The Australian apicultural industry is under significant threat from several pests and diseases such as Chalkbrood and American Foulbrood.

Chalkbrood is a disease of honeybee brood caused by the fungus *Ascosphaera apis* (Chalkbrood fungus). Gut microbiota probably play an extremely important role in honeybees. It is believed that they may contribute to food digestion, produce essential vitamins used by the host, and/or prevent potentially harmful pathogens from colonising the gut.

This is the first study of bacteria that inhabit the Australian honeybee gut. Healthy colonies had high numbers of gut bacteria. Honeybee colonies infected with Chalkbrood consistently had significantly lower gut bacterial flora than

healthy bee colonies. In colonies that recovered from Chalkbrood, the gut bacteria had increased to close to normal levels. Bee gut bacteria are a strong indicator of hive health. In the future it may be possible for apiarists to use this parameter to monitor hive health and as a predictor of bee colony disease onset.

For the first time ever, probiotic feeding experiments were done to determine whether artificially-fed bacteria could be established in the bee gut. It was found that high numbers of two different species of Chalkbrood-inhibiting bacteria (*Bacillus* and *Pseudomonas* species) could be maintained while regular feeding occurred. This observation opens the way for probiotic feeding of bacteria to be developed as a method to maintain hive health and a means of biocontrol of diseases such as Chalkbrood.

Overseas research

Research on insect pollinators is receiving a major boost in support in Canada. The Canadian Honey Council and the Canadian Association of Professional Apiarists have been heavily involved in planning a five-year, \$5 million research network that is already investigating the issue of pollinator decline.

The project involves over 45 researchers at universities and government agencies, and looks at Pollinators, Plants, Ecosystems, and Economics. The health and efficiency of managed bees (including honeybees, bumble bees and leaf cutter bees) will include a survey of honeybee pathogens and parasites in Canada, breeding AFB-resistant bees, increasing resistance to *Nosema*, biocontrol of pests, reducing the impact of pesticides, and use of pollen substitutes in disease control.

Alternative species for commercial pollination will also be looked at, as will wild pollinators.

In plants, the mechanism of pollination will be examined, and plants most at risk from declining pollinator populations will be identified. In the ecosystem area, such things as habitat loss, agricultural and forestry practices (and their effect on pollinators), and climate change will all be evaluated. In the economics area, predictions of future pollination needs will be made, particularly in relation to climate change and changes in land use.

The major approach of the scheme is that it will look at ALL aspects of pollination to address the full scope of pollination problems in Canada.

(from HiveLights, Nov. 2009)

