HOUSE OF REPRESENTATIVES STANDING COMMITTEE ON

AGRICULTURE, FISHERIES AND FORESTRY

Discussion Paper

Future Development of the Australian Honey Bee Industry

The discussion paper does not present the views or conclusions of the Committee

House of Representatives Standing Committee on Agriculture, Fisheries and Forestry

Inquiry into the future development of the Australian honey bee industry

The House of Representatives Standing Committee on Agriculture, Fisheries and Forestry is currently undertaking an inquiry into the future development of the Australian honey bee industry.

The honey bee industry is a small but highly significant industry. Its direct contribution to the Australian economy is around $60 million per annum. In addition, honey bees provide free pollination services to a wide range of agricultural and horticultural industries, estimated to benefit the economy by some $2 billion per annum.

The inquiry seeks to identify current and future prospects of the honey bee industry. It will review the industry's role in agriculture and forestry; biosecurity issues, including pest and disease threats such as Varroa, and quarantine; trade issues, including export potential, import competition and the potential risks of labelling imported products as 'Australian made'; the impact of land management and bushfires, including changes in agricultural practices, land clearing and exclusion from public lands, upon the honey bee industry; research and development needs, including potential models for a centre encompassing the research, training and extension needs of the industry; and existing industry and government initiatives in support of the honey bee industry.

The purpose of the inquiry is to establish both a broad policy framework for the development of the honey bee industry and to identify specific issues that need to be addressed.

This discussion paper is not intended as a definitive document. The aim of this paper is to assist and challenge those who may make a submission or otherwise assist the Committee in the inquiry. The matters raised and questions identified are not intended to be exhaustive.

Its purpose is to raise a number of issues relating to the future development of the Australian honey bee industry and the response of industry and government to those issues. It addresses those issues at the forefront of public debate in broad terms with the intention of provoking more detailed responses from individuals and organisations interested in making a contribution to the future development of the industry and the industries it supports. It seeks to canvas the views of a wide range of stakeholders from government, industry, the scientific community and individual members of the community.

The discussion paper does not present the views or conclusions of the Committee.

Submissions to the inquiry may respond to the discussion paper or to all or some of the terms of reference. Details of the terms of reference and making a submission to the inquiry are provided overleaf.

Terms of Reference

Inquiry into the future development of the Australian honey bee industry

The inquiry will examine the honey bee industry in terms of:

1. Its current and future prospects.
2. Its role in agriculture and forestry.
3. Biosecurity issues.
4. Trade issues.
5. The impact of land management and bushfires.
6. The research and development needs of the industry.
7. Existing industry and Government work that has been undertaken for the honey bee industry.

Submissions can be e-mailed to Aff.reps@aph.gov.au

Or sent to the following address:

The Secretary - Agriculture, Fisheries and Forestry Committee
R1.121
House of Representatives
PO Box 6021
Parliament House
Canberra ACT 2600

The closing date for submissions is **Friday 25 May 2007** although the committee will accept late submissions.

The discussion paper is available at www.aph.gov.au/house/committee/primind

Discussion Paper

Inquiry into the future development of the Australian honey bee industry

The honey bee industry is a small but highly significant industry. Its direct contribution to the Australian economy is around $60 million per annum of honey and related products, such as packaged bees, queen bees, beeswax, propolis and honeycomb, and paid pollination services. In addition, however, honey bees (*Apis mellifera*) provide free pollination services to a wide range of agricultural and horticultural industries, estimated to provide direct benefit to the economy of some $2 billion per annum.

The honey bee industry faces a number of significant and interrelated challenges. The most important is the potential threat of pests and disease. The Varroa mite (*Varroa destructor*) has the capacity to annihilate feral bee populations and place severe pressure upon managed bee populations. Scientists who have studied the progress of the pest believe that it is only a matter of time before it arrives in Australia and devastates the honey bee population. This has significant implications for industries relying on honey bees for crop pollination. Bees are the principal pollinator for a range of fruit, vegetable and nut crops. They also play a significant role in pasture production, with implications for meat and dairy producers.

To meet the threat of Varroa will require the development of a honey bee industry capable of providing managed pollination services to a range of industries. This, in turn, will require professional development within the industry, a higher level of coordination between industries, a sustained research effort to minimise the impacts of pests and diseases and maximise the impact of paid pollination services, and better access to floral resources to maintain hive strength and health before and after the provision of pollination services.

Addressing these challenges will make the industry stronger and more efficient, ensuring its long term viability.

Key policy objectives for the future development of the honey bee industry include:

1. Addressing the threat posed by pest and disease incursions.
2. Enhancing resource security.
3. Creating a ‘pollination industry’.
4. Meeting the research and development needs of the industry.
5. Improving professional training and development within the industry.
6. Communicating the important role and requirements of the honey bee industry to governments, industry and the general public.

1. Addressing the threat posed by pest and disease incursions.

The threat of pest and disease incursions is the most significant issue facing the honey bee industry and honey bee pollination dependent industries. The Varroa mite is the most immediate pest threat. It is present in every population of honey bees (*Apis mellifera*) outside Australia, and it is only a matter of time before it arrives here. When an incursion occurs, Varroa will spread rapidly, annihilating feral bee colonies and decimating managed bee colonies. Moreover, the available chemical control agents will only provide protection to managed bee colonies for so long before the mites develop resistance and further devastation occurs. Indeed, Australia faces the prospect of an incursion by mites having already evolved a high degree of chemical tolerance.

The implications for the honey bee industry and those agricultural and horticultural industries reliant on honey bee pollination are clear. There must be a higher level of coordination within and between industries to ensure that managed bee colonies are sufficient in number and strength to meet the pollination requirements of agriculture and horticulture. This will require:

- Better organisation within the honey bee industry to provide pollination services in the appropriate quantities to the appropriate standards.
- Better understanding within honey bee pollination dependent industries of the role of honey bees and the requirements of beekeepers.
- Research and development to minimise the impact of a Varroa incursion and maximise the effects of managed pollination.
- Access to floral resources to maintain hive numbers and strength before and after pollination of crops/pasture.

In this vein, the Committee is aware of the recent Honeybee Industry Linkages Workshop (23–24 April 2007), which brought together a range of stakeholders from industry, science and government to examine the issues facing the honey bee industry and other pollination dependent industries. The workshop identified the need to form an industries network to coordinate development within and between industries, and laid the foundation for putting such a network in place.

Varroa is not the only pest and disease threat facing the honey bee industry in Australia. Another mite, Tropilaelaps (*Tropilaelaps clareae*) , represents a threat as great in magnitude as Varroa, although an incursion is less likely. Tracheal mite (*Acarapis woodi*) is another potential pest threat. The principal carriers of these pests are other exotic bee species such as the Asian Honey Bee (*Apis cerana*) and the Giant Honeybee (*Apis dorsata*). Incursions by African honey bees (*Apis mellifera scutellata*) or aggressive Africanised hybrids also represent a threat. Incursions of all three species have been detected in Australia (all were destroyed and there is no evidence of established colonies). Another significant and growing threat is from the still ill-defined Colony Collapse Disorder, which has become widespread in Europe and North America, resulting in the collapse of the managed bee population in affected areas.

Given the magnitude of the threat faced by the honey bee industry and related industries, effective quarantine and other biosecurity measures are essential. Quarantine facilities allow the importation of breeding stock from overseas without the risk of pest and disease incursion. They also have the potential to allow for the detection and destruction of hybridised bees in imported breeding stock if the available diagnostic technology is applied. Imported breeding stock is vital to maintaining the quality and vigour of the Australian honey bee population.

Sentinel hives allow for the early detection of exotic bee and parasite incursions around major ports. Special traps are also used to detect Asian honey bees (*Apis cerana*) in some locations. The need to expand this program to improve border security was raised in a review published in 2005. On the other hand, New Zealand experience indicates that sentinel hives may only alert us once a pest has become established and is beginning to spread. One possible solution is to educate and resource all beekeepers as sentinels, increasing the odds of early detection. The cost of maintaining a system of surveillance and reporting is small given what is at stake.

2. Enhancing resource security.

Access to floral resources underpins the viability of the honey bee industry. The principal sources of nectar and pollen for the production of honey and the maintenance of hive health are native forest species—especially eucalypts and leatherwood (Tasmania)—and certain weed species such as Paterson's Curse (Salvation Jane). Some commercial crops are useful sources of nectar and pollen when in season, but not all crops are good for bee nutrition and pollination has potential nutritional costs, leading to hive depletion. The level of access to floral resources limits the size of the industry and therefore its capacity to provide pollination services. *Access to native flora is essential to crop pollination in Australia.*

Despite this, beekeeper access to native flora is under increasing pressure from land use change, declining access to public land, land clearing and the impact of bushfires. From the point of view of the industry, the exclusion of beekeepers from national parks is a critical issue. A high proportion of melliferous (honey producing) forest is on public land. As more national parks and conservation reserves are gazetted, the beekeepers traditional range is being restricted. Land clearing on private land also impacts on beekeepers by further reducing access to native flora. While current rates of clearing are much reduced on past levels, there has been little rehabilitation of cleared land and much of the remaining flora consists of isolated pockets of ageing trees. Plantation forestry rarely offers anything to beekeepers as long term floral resources are exchanged for pines or eucalypt hardwoods that are harvested before reaching full maturity. More intensive pasture rotation reduces clover as a beekeeping resource. Bushfires can have a devastating impact on beekeepers, rendering hive sites useless for years while forests recover and trees begin to flower again.

Possible solutions to these problems are:

- Greater access to national parks. This will require research on the impact of honey bees on native flora and fauna, and the adoption of stringent environmental management practices by the honey bee industry.
- Using revegetation schemes and carbon credits to encourage replanting of melliferous flora on private land.
- Educating landowners on the important role of bees in agriculture and encouraging them to maintain stands of native flora as hive sites.
- Encouraging pollination dependent industries to set aside land for native vegetation for use by honeybees as part of an integrated land management strategy.
- A more holistic approach to the management of certain weed species in recognition of their importance to bee health and honey production (e.g. Paterson's Curse, Capeweed).
- Better fire management.

3. Creating a 'pollination industry'.

One of the critical needs identified by the recent Honeybee Industry Linkages Workshop was the need for the various industries dependent on honey bee pollination and the honey bee industry itself to take a more cooperative and integrated approach in their relationship with each other, in effect to regard themselves as a single 'pollination industry'. To be effective, managed crop pollination depends on apiarists providing a highly professional service to their clients, and agriculturalists and horticulturalists understanding the needs of beekeepers. This in turn requires education and training on both sides and effective communication.

An important consideration for beekeepers is providing the optimum number of hives at the optimum time to maximise crop output. This requires a scientific understanding of the needs of individual crop species and the bees servicing them. Crop growers need to understand something about the life cycle and nutritional needs of bees, and be aware of how crop management practices, particularly the use of pesticides, can impact on bees and the honey they produce.

A pollination industry cannot be created overnight. Pollination is a cooperative venture between apiarists and growers. It requires a high level of skill, specialised equipment, crop knowledge, and the ability to manage bees for pollination. A strong and viable honey industry is essential to the provision of pollination services—beekeepers cannot survive on pollination alone. A profitable, sustainable and resilient honey bee industry is vital for crop pollination.

There are benefits for everyone in the integrated management of pollination services—higher profits for beekeepers and greater productivity for farmers. Managed pollination increases crop yields, improves quality and reduces flowering time. Moreover, managed hives are far less susceptible than feral bees to devastation by pests such as Varroa, providing greater security to the agriculture and horticulture industries. The cost is greater professionalism on the part of all parties, including creating pollination service standards; the provision of training and education for

beekeepers and farmers alike; and investment in research to maximise the benefits of managed pollination.

4. Meeting the research and development needs of the industry.

There are several areas of research and development critical to the future of the honey bee industry and the 'pollination industry' in Australia. First and foremost is the need to address the threat of pests and diseases, particularly the Varroa mite. Research is required on:

- Incursion management;
- Pesticide resistance in mites;
- Developing mite tolerance within bee populations;
- Resistance to viruses transmitted by mites; and
- Alternatives to honey bee pollination (e.g. leafcutter bees in lucerne).

It should be noted that CSIRO modelling of the impacts of a Varroa incursion indicate that expenditure of $21–50 million per annum could be justified in order to keep Australia Varroa free, this figure representing the aggregate benefits to pollination dependent industries of keeping Varroa out or removing its lethal effects.

Research also needs to be undertaken on other potential incursion threats and the management of existing pest and disease problems, such as American Foulbrood, European Foulbrood, and Small Hive Beetle. Antibiotic contamination of honey is a potential threat in the treatment of foulbrood diseases.

Research on crop pollination is important. Each plant species has its own pollination characteristics, and these must be identified and addressed to maximise returns from paid pollination services. Moreover, the impact on hive health for each plant species must also be identified.

Study is required into the impact of honey bees (*Apis mellifera*) upon the natural environment in Australia. This is particularly important in addressing the vexed question of the presence of bees in national parks. It must be established through independent research (i.e. neither funded by industry nor conservation groups) what impacts honey bees are having on native species, and whether negative impacts can be managed or suppressed. The development of effective environmental management systems which apply across the industry should also be a priority.

Important positive priorities for research include improving the genetic stock of honey bees, investigation of the medicinal properties and uses of honey, and improved value adding and marketing of Australian honey products.

In its previous report, *Skills: Rural Australia's Need*, the committee recommended the establishment of a CRC-style entity for beekeeping and pollination, to act as the focal point for bee research. Such an entity would be established broadly upon the CRC model, but with higher levels of government funding in recognition of the public good

impacts of the honey bee industry and its relatively small size and financial base. Other industry stakeholders would also be expected to contribute. This CRC-style entity would conduct research into apiculture and pollination, but also provide a critical mass of expertise for the provision of extension services and industry training. It would provide professional development opportunities for extension officers and higher education opportunities at the undergraduate and postgraduate level.

A keynote of several speakers at the Honeybee Industry Linkages Workshop was that there was inadequate funding for strategic research on honey bees, that more money was required for basic research and for efforts to prevent or control pest and disease incursions.

5. Improving professional training and development within the industry.

The evidence presented to the Committee during its inquiry into rural skills training and research indicated that the number of education services available to beekeepers was quite low and that there had been a significant decline in the availability of finances for government advisory and support services. With a rapidly ageing workforce, and a range of new threats and opportunities imminent, the need to provide training opportunities to new and existing beekeepers, and other stakeholders in the 'pollination industry', is urgent.

One area of training vital to the industry is the recognition and treatment of pests and diseases. This is particularly important amongst the larger number of amateur and semi-professional beekeepers, who can act as vectors for pests and diseases if they are unaware of potential threats and the best means of dealing with them. Good education will lead to good husbandry, which in turn reduces the impact of pest and diseases.

There is a need for the development of training and certification in pollination services, to ensure that those providing the service can meet the needs of clients, and that those in pollination dependent industries understand what needs to be provided.

Specific training in environmental management systems will ensure that the industry limits the impact of its activities upon the natural environment and will give land managers and the public confidence in the ability of the honey bee industry to meet environmental standards.

Food quality standards are also an issue. Honey producers need to understand contamination risks and how to avoid them, as well as the implications for the industry of contaminated products reaching consumers. A 'clean, green' image is vital to the Australian honey bee industry in the face of low cost competition from China and South America. The B-Qual industry quality assurance program is an important part of this, but it requires whole of industry participation and training of beekeepers to meet the required standards.

Better business skills are essential to a more professional and productive industry, particularly for beekeepers involved in providing pollination services. There is some

concern amongst those engaged in pollination dependent industries that the price of paid pollination services does not always reflect the cost to the beekeeper or the benefit to their client.

Formal qualifications in various aspects of beekeeping will provide a mechanism for the recognition and transfer of skills. Competencies and qualifications in beekeeping have been developed under the auspices of the Rural Production Training Package RTE03, and have been available to training providers since March 2007.

The CRC-style entity recommended by the Committee in *Skills: Rural Australia's Need* could provide a training and extension hub, utilising concentrated expertise in a range of fields for the provision of extension services and industry training. This would help to negate the problem of providing high quality training and extension to a small and widely dispersed industry.

6. Communicating the important role and requirements of the honey bee industry to governments, industry and the general public.

Getting governments, industry and the community to understand the role and requirements of the honey bee industry is seen as an important outcome by those involved with the industry. Pollination is essential to food production and in a wide range of food producing industries, including fruit, vegetables, grains, meat and dairy, the honey bee is essential to pollination. Even in industries that can rely to some extent on alternative pollinators, the honey bee is often the difference between commercial viability and failure.

With this in mind, participating stakeholders at the Honeybee Industry Linkages Workshop identified the need to establish a pollination industries network, to coordinate activities between the honey bee industry and pollination dependent industries, and to present a united front in dealing with governments and the community. The network would include the honey bee industry, pollination dependent industries, governments, scientists and land managers. It would focus upon a range of issues including research, extension, training and communication. Its role would include creating a research strategy, an industry code of conduct, a land access agreement, a communications strategy, and pest/disease incursion plans.

Educating apiarists, agriculturalists and horticulturalists will be an important role for the network, creating an environment in which a 'pollination industry' can become a reality. Public education will also be a major responsibility for the network. Public confidence in the honey bee industry is essential to justifying industry access to public land and government expenditure on honey bee research. In this vein, a national code of conduct would be used to minimise the honey bee industry's ecological footprint. 'Bees in the landscape' would be the catchcry of property management planning. Linkages with environment groups could assist the industry by educating environmentalists on the role of bees in the landscape while allowing the industry to better address environmental concerns.