


Submission No: 25
Date Received: 25-5-07
Secretary: 

Queensland Government Submission to the

**Standing Committee on Agriculture, Fisheries
and Forestry**

**Inquiry into the Future Development of the
Australian Honey Bee Industry**

State of Queensland submission prepared by
Department of Primary Industries and Fisheries
Department of Natural Resources and Water
Environmental Protection Agency
May 2007

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GLOSSARY

AFB	American foulbrood
DAFF	Department of Agriculture Forestry and Fisheries
DPI&F	Department of Primary Industries and Fisheries
FPQ	Forestry Plantations Queensland
MR	Department of Main Roads
NRM (FP)	Department of Natural Resources and Water (Forest Products)
NRW(SLAM)	Department of Natural Resources and Water (State Land Asset Management)
QBA	Queensland Beekeepers' Association
QPWS	Queensland Parks and Wildlife Service
RIRDC	Rural Industries Research and Development Corporation
SEQFA	South East Queensland Forest Agreement
SHB	Small hive beetle

1 Its current and future prospects

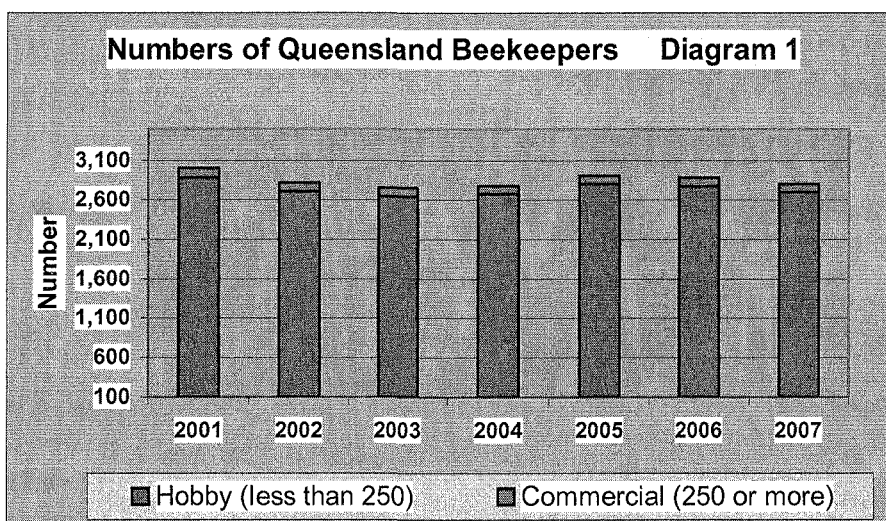
1.1 Current prospects

1.1.1 Industry profile

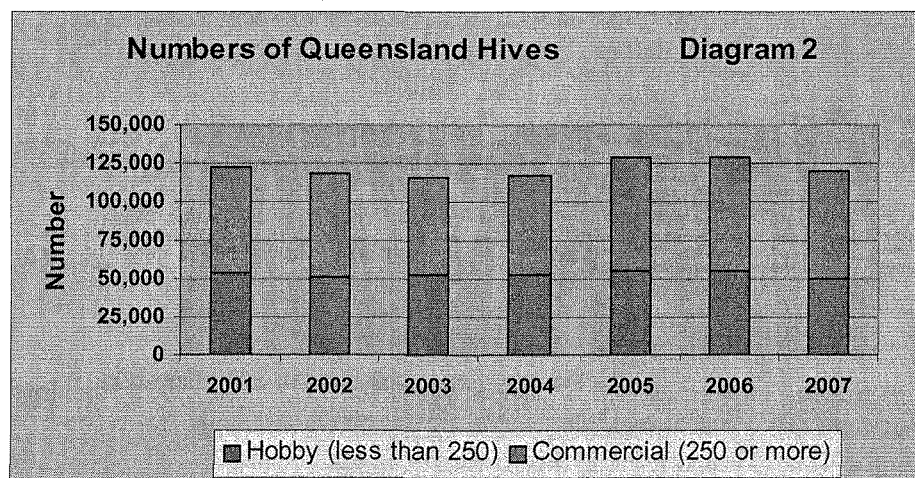
Records indicate that beekeeping had been established in Queensland by a number of landowners by 1851. Some reports indicate earlier introduction of hives dating back to 1824, following the settlement of Moreton Bay (Weatherhead, 1986).

The industry in Queensland is a small but consistent producer of high quality honey targeting mainly the export and domestic retail market and queen bees for the interstate and export markets.

There are 3078 registered beekeepers in Queensland with 119 250 hives as of April 2007. Details of the different categories of registered beekeepers are provided in Appendix 1. The numbers of beekeepers and beehives have remained relatively constant over the last seven years (refer Diagrams 1 and 2).



Source: Biosecurity Queensland Bee Industry Register Database, Warwick



Source: Biosecurity Queensland Bee Industry Register Database, Warwick

Registered beekeepers can be categorised in three broad groups:

- Hobbyists and part-time operators/ multi enterprise farms 0-249 hives 96.5% of beekeepers 42.4% of hives
- Commercial 250+ hives 3.5% of beekeepers 57.6% of hives

Commercial beekeepers are regarded as those who each own more than 250 hives. Honey production by tonnage and value is dominated by a small number of large commercial producers. There are 107 beekeepers that fall into this category and this group has almost 60% of the hives which roughly equates to the volume of production. Hive management practices vary with the size of the operation, with commercial apiarists being migratory, shifting their hives sometimes up to six times a year to optimise access to floral resources. Successful beekeepers maintain a high degree of knowledge of the location and flowering characteristics of honey flora in order to ensure their bees are well-placed for access at peak nectar flow times (Lamb, 2005)

Access to Queensland honey flora resources is also critical to a number of New South Wales beekeepers and is an important part of their hive management practices. While these beekeepers have to obtain a health certificate to transport hives into Queensland, details of the number of hives is not recorded. There are also a large number of Queensland beekeepers that access New South Wales honey flora resources.

1.1.2 Location

The beekeeping industry is located predominantly in the south-eastern corner of Queensland, however there are hives located throughout the State.

Native forests and woodlands, particularly eucalypts, make up more than 90% of the floral resources for the Queensland industry. An estimated 40% of resources currently utilised are on State Forests and National Parks, with the remaining 60% on other land tenures, including leasehold and freehold lands, stock routes, roads and reserves (DPI&F, 2004). Details of some of the major beekeeping areas in Queensland are outlined in Table 1.

Some of the major beekeeping areas in Queensland (other than South East Qld)

Table 1

Location	Uses	Season	Resource utilised
The far west Paroo	honey and pollen	winter/spring	yapunyah, wildflowers
Coastal ranges Burnett	honey	summer	spotted gum, grey ironbark, brush box
Darling Downs	honey and pollen	winter/summer	mountain coolabah, sunflower, ironbark, agricultural weeds, yellow box
Burdekin horticultural area	pollination	autumn/winter/spring	horticultural crops, melons, pumpkins, cucumber, zucchini

Source: (DPI&F, 2004)

1.1.3 Value

Queensland's honey production is now valued at \$14 million annually, while other products, including queen bees, beeswax and pollen, bring the total Queensland value to \$16 million (DPI&F, 2004).

Queensland agriculture also relies on managed honey bees for the pollination of an array of fruits and vegetables such as apples, avocados, stone fruit, melons, citrus, macadamias, cucurbits and vegetable seed production. Pollination provides an estimated benefit to crop production of about \$450 million annually to these Queensland industries. This estimate is based on a methodology used by Gibbs and Muirhead (1998) and uses the 2005 crop production values.

1.1.4 Industry structure

The beekeeping industry has an active State peak body: the Queensland Beekeepers' Association (QBA). QBA represents most of the commercial beekeepers and has a number of branches in southern Queensland. QBA is affiliated with the Australian Honey Bee Industry Council, the peak national industry body.

There are also numerous recreational groups, mainly representing hobbyists, some of which are affiliated with QBA

- Capricornia Beekeepers' Club Inc.
- Mackay Region Beekeepers' Association
- Southern Beekeepers' Association (Qld) Inc. (Toowoomba)
- Sunshine Coast Beekeepers' Group
- Townsville and District Beekeepers' Association
- Whitsunday Beekeepers' Association
- Bayside Beekeepers' Association Inc.
- Brisbane Amateur Beekeepers' Society
- Gold Coast Amateur Beekeepers' Society Inc.
- Ipswich and West Moreton Beekeepers' Association Inc.
- Northside Beekeepers' Association Inc.

1.1.5 Key issues impacting on the industry

Drought

Drought is currently having a major impact on honey production in Queensland with little or no honey production for beekeepers since the end of 2006. There are increasing enquiries from hobbyists for information on alternative bee feed to keep their hives alive. A number of Queensland beekeepers have moved their hives to south western Queensland hoping for a crop of Yapunyah honey.

Profitability

Due to the current honey wholesale price and cost of production many beekeepers are not profitable. The cost of production is currently estimated to be between \$2.20 and \$2.90 per kilogram, while the wholesale price is varying between \$1.80 and \$2.80 per kilogram. The current retail honey price is similar to that when beekeepers were receiving a wholesale price of \$5 per kilogram. (pers. comm. Warhurst, 2007)

Industry skills

With the average age of beekeepers in Australia being 58 years there is concern with the future skill level of the industry. There has also been difficulty in keeping labour due to the nomadic way of life (Zinn, 2006). Industry has raised concerns that there

is lack of educational courses on beekeeping in Queensland. This has been exacerbated until recently, by the absence of an approved training scheme and experienced industry trainers to hold the courses. The QBA has recently endorsed a beekeeping certificate course that covers issues from hive management and disease recognition and control to extraction of honey (Morley, 2007).

Disease management

There are a number of diseases that are impacting on the industry. These are addressed in the section on biosecurity issues.

1.2 Future Prospects

1.2.1 Future Production

In the short term the ongoing drought is having a significant impact on production. Longer term it is not expected that the industry will significantly expand and may even contract as prices decrease in real terms and input costs continue to grow. The number of hobbyists should remain stable. However there could be a decline in the number of part time producers due to cost pressures.

Pollination services will continue to expand slowly but will not be a significant part of the Queensland industry in the short to medium term.

1.2.2 South East Queensland

In 1999, the signing of the South-East Queensland Forests Agreement (SEQFA) provided for protection of important forest ecosystems in south east Queensland through the immediate transfer to forest reserve and termination of any further timber harvesting on 425 000 ha of former State Forests, and the future transfer of a further 375 000 ha of State Forest once timber harvesting was phased out. As of January 2007, 188 594 ha has been converted to protected area, with much of this area being dedicated as National Park.

Beekeeping is inconsistent with the management principles of National Park tenure. However the *Nature Conservation Act 1992* was amended in 2004 to allow beekeeping to continue until 2024 on SEQFA and Wet Tropics lands being transferred from Forest Reserve to National Park or National Park (recovery) tenure. This amendment provided for the continuation of existing apiary sites for beekeepers while alternative resources were found for the industry by 2024.

The discontinuation of timber harvesting in forest areas means that harvesting roads used by beekeepers to access sites may not continue to be maintained where they are not required for management of the protected area. Remaining management roads, including fire management trails, may not be maintained to a standard suitable for beekeepers' use. In these cases, it may be possible to relocate sites to suitably maintained access roads, in keeping with a commitment to preserving the total number of apiary sites on the areas of previous forest reserves through to 2024.

Investigation of freehold land for honey production in south east Queensland indicates that there is almost 19 000 hectares of high honey yielding forest areas located on freehold land, which may be available as an alternative resource when access to SEQFA lands ceases in 2024. Further investigation of the current use, remnant size, accessibility (including type and standard of access roads) and a range of factors relating to suitability of these forest lands is required to determine their

usefulness as new sites. Access arrangements with landholders will also need to be pursued.

The benefits of bees and the potential for financial returns from beekeeping are not fully appreciated by many landowners when compared to some countries such as New Zealand. An education program will need to be implemented during negotiations with landowners on access of commercial beekeeping to their land.

1.2.3 Rest of Queensland

Assessment of alternative resources has been focused in south-east Queensland. There is a possibility that significant alternative honey flora resources may exist in other areas of Queensland.

2 Role in agriculture and forestry

2.1 Role in pollination of crops

Managed pollination services are increasingly important part of the beekeeping industry in Queensland. However no data is directly collected to value this section of the industry. Crops pollinated on a paid basis include apples and stone fruit, melons and other cucurbits, macadamia, avocado and sunflowers. For example, about 2,000 hives in the Granite Belt are being used specifically for pollination.

Beekeepers are paid \$40 to \$60 per hive for pollination for a 2-3 week period on apples and \$10 to \$25 per week for cucurbits. Payment to beekeepers for pollination services also occurs in the production of hybrid sunflowers production in the Burdekin, Darling Downs and Central Highlands (pers. comm. Warhurst, 2007)

There is no large-scale pollination service used in plantation horticulture in Queensland. Discussions with Managed Investment Scheme operators have indicated that they are unlikely to invest in this service in Queensland in the short to medium term (pers. comm. Learoyd, 2007).

There has been no recent study of the value of indirect benefits of pollination to cropping; consequently it is difficult to place an accurate value or size to this aspect of the beekeeping industry. The amount of \$450 m previously quoted was based on an estimate of the effect of withdrawal of bee pollination services from horticulture and other crops.

Currently a significant amount of pollination is carried out free of charge by feral bees (introduced honey bee species escaped to the wild) . However, in the event of an incursion of an exotic bee mite such as *Varroa destructor*, feral bee colonies are likely to be destroyed and this resource for horticulture and agriculture would disappear. These industries would then be reliant on managed bee hives.

2.2 Forestry plantation

Forestry plantations are primarily designed for commercial timber production. There is, therefore, some incompatibility with honey production for a range of reasons including:

- The length of time taken to maximise the value yield in wood products is significantly less than the time taken for honey production volumes to maximise; and
- Desirable honey flora species in Queensland are different to the desirable timber production species.

Despite these difficulties there may be some complementary opportunities for limited honey production from some plantation sites.

Plantation establishment primarily for honey production seems a very expensive method of establishing alternative resources when compared to the management of native forests with honey production as one of its uses.

3 Biosecurity issues

3.1 Legislative requirements

DPI&F is responsible for administration of the *Apiaries Act 1982*. The Act provides for the regulation and control of the keeping of bees; and the control, prevention and restriction of diseases and pests affecting bees. The Act authorises the appointment of inspectors and honorary inspectors and provides powers to do such things as enter premises, investigate, enquire, question, stop, detain and direct compliance.

The Act also regulates and controls the keeping of bees, by allowing for such activities as; registration of beekeepers; permitting the bringing of bees into Queensland; registration and classification of apiaries; and removing bee hives. The Act contains specific disease notification, prevention, and control measures to prevent, control or restrict diseases affecting bees. The Act creates a number of offences.

The *Apiaries Regulation 1998* provides for;

- The classification of apiaries;
- Branding of hives;
- Obligations on persons aimed at disease prevention;
- Exclusion of parts of the State from the application of specified sections of the Act;
- A schedule of notifiable diseases;
- A schedule of fees; and
- Various other administrative matters such as appeal rights for certain decisions of decision makers.

3.2 Disease recognition and diagnosis

The majority of registered beekeepers in Queensland are hobbyists. In general, they don't have the training or exposure to the possible diseases of bees and hives to become competent in recognition of disease.

This could allow a new or exotic disease to become established and spread before a problem was recognised and reported.

However it is noted that Varroa mite infestation in New Zealand was initially reported by a hobby beekeeper, but by that time the pest was estimated to have been in the country for about three years.

Recommendation 1

A coordinated national awareness program directed at hobbyists as well as mainstream apiarists would help bridge this disease recognition gap.

DPI&F has three animal health laboratories that provide services largely to the livestock industries. There is limited capacity for specialised diagnostic resources for bee pests/diseases and bee identification. DPI&F utilise AQIS and CSIRO entomologists and facilities for routine identification of suspect exotic bees. However there are concerns that laboratory resources would be severely stretched in the event of an actual incursion of an exotic bee pest or disease such as Varroa mite (*Varroa destructor*) or Tracheal mite. Such specialised testing is difficult to outsource to the private sector.

Recommendation 2

Australian Government support for maintenance of laboratory capability for diagnosis of bee pests should be planned so it is available in the event of an emergency pest or disease incursion.

3.3 Exotic/emergency pests and diseases

3.3.1 Varroa

Australia is the only remaining continent free of Varroa mite. This bee pest has decimated bee populations overseas and would seriously affect the viability of the Australian honeybee industry. A recent workshop in Canberra identified that there are many horticulture, agriculture and pasture industry crops that would be seriously affected by lack of pollination by honeybees. It is estimated that hive numbers could be halved and feral bee hives which are currently pollinating many crops would be destroyed completely. There is an increased need for vigilance since this pest is now endemic in New Zealand. Mite surveillance is being increased with the use of beekeeper collaborators.

3.3.2 Other exotic mites

In addition to Varroa mites there are *Tropilaelaps* mites and Tracheal mites which are exotic to Australia and pose threats to the Australian honeybee industry. Their effects on Australian hives could be more damaging than in overseas hives because Australian hives tend to have brood in the hives all year round.

3.3.3 Colony Collapse Disorder

Colony Collapse Disorder is a problem that has affected apiaries in the United States for several years. The cause is unknown at this point in time, but the effect is devastating with death and abandonment of hives.

3.3.4 Disease control strategies

DPI&F provides input into and emergency response support for the Australian Veterinary Emergency Plan (AUSVETPLAN disease strategy for bee diseases and pests.

The size of the industry and the free movement of bees across State borders indicate that a national approach to bee disease prevention and control needs to be continued.

Recommendation 3

National approach to disease prevention and control is warranted.

Contingency planning to deal with an outbreak of Varroa should begin now to improve Australia's capability to respond to an outbreak and give a better chance of effectively eradicating the pest.

3.4 Border controls to prevent introduction of disease/pests

The presence overseas of highly virulent, rapidly spreading diseases and pests such as Varroa and Colony Collapse Disorder emphasises the importance of strict border quarantine restrictions and a well resourced quarantine facility to handle imported bees which are important to maintain the genetic quality of Australian honeybees.

3.5 Areas of concern for Queensland beekeepers that are industry biosecurity issues rather than jurisdictional responsibilities

3.5.1 Small hive beetle

Small hive beetle (SHB) is an insect pest of bee hives that invaded Australia in 2002 and has spread extensively due to normal hive movements. Currently they do not appear to be severely affecting hives unless the hives are already weakened by disease and poor nutrition. Management of the beetle is necessary to maintain hive productivity.

Recommendation 4

Ongoing research is essential to establish new and non-chemical approaches to in-hive controls that do not jeopardise the 'clean, green Australian honey' image. Research to date has focussed mostly on chemical controls of the beetle stages outside the hive.

3.5.2 American foulbrood

Endemic disease, notably American foulbrood (AFB), is an ongoing production issue and needs to be managed. Honey testing is available at a DPI&F laboratory but the service is not extensively used by industry. This could be associated with the added cost of the testing in an industry that suffers major cost – price pressures or to lack of foresight and knowledge of some beekeepers.

Recommendation 5

Industry could promote AFB control through companies offering a premium price for honey with a low AFB spore count.

3.5.3 Black ants

Endemic pests such as black ants are also capable of causing severe problems in bee hives.

Recommendation 6

More research into control measures of black ants is required.

3.5.4 Chemical poisoning

Accidental chemical poisoning of bees from farmers treating insect pests of horticulture crops is another area of concern.

Recommendation 7

The effects of agricultural chemicals on bees requires research as well as education of farmers on using bees for pollination.

4 Trade issues

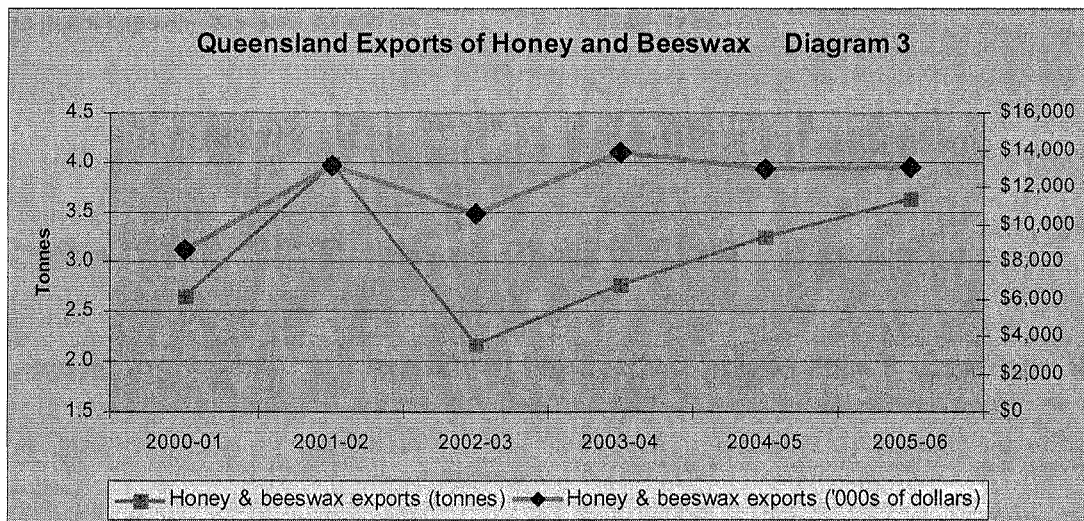
4.1 Honey and beeswax exports

In 2005-06, Queensland exported 3,600 tonnes of honey and honey products valued at \$13 million to the United Kingdom, Indonesia and other south east Asian countries, North America and Saudi Arabia.

There has been an increase in exports in recent years rebounding from a low in 2002-03 because of low honey production due to the severe drought. Prices have declined over the last four years from high prices in 2002-03 (refer Diagram 3).

Exports mainly consist of bulk honey in 4 kg containers and beeswax (115 tonnes valued at \$732,000). There is also a small amount of honey comb exported.

While many small industries suffer from lack of economies of scale and skills to engage world markets, Queensland is fortunate that Capilano Honey Limited is headquartered in Queensland. Capilano Honey has become one of the world's leading honey supply companies, enjoying a high reputation in product innovations, best practice procedures and honey quality. With global operations in Canada and Argentina, Capilano exports to more than 45 countries including Europe, North America, Middle East, the Indian sub-Continent, Asia and the Pacific Islands (Capalino Honey, 2006).



Source: Queensland Treasury – unpublished ABS trade data

4.2 Queen bee exports

Because of the production environment and relative disease free status of the bee industry in Queensland, queen bee exports have been increasing. Queen bee exports can vary from year to year, however recently there have been large orders for export to the United States, Canada, the Middle East and Asia. In 2005-06 one producer filled an order to export up to 10,000 queens per year to the United States. There are numerous small queen breeders operators, producing from 300 to 500 queens per week (DPI&F, 2006).

5 The impact of land management and bushfires

5.1 Land Tenure Legislative Requirements

The *Nature Conservation Act 1992* provides for authorised beekeeping activities on some protected areas including conservation parks and resource reserves.

Beekeeping is not normally allowed on National Parks. However, where a new National Park is declared on land used for beekeeping, this activity can be allowed to continue for the unexpired term of existing apiary permits up to a maximum of five years.

An exception to the above has been negotiated in relation to South East Queensland Forest Agreement and Wet Tropics Forest Reserve lands designated for apiaries, where beekeeping will be allowed to continue until 2024.

5.2 Land tenure for apiary sites

A wide range of locations are utilised by beekeepers, involving various tenures of land. Several authorities oversee land tenure- refer Table 2. These bodies have individual requirements and particular fee scales apply.

Authorities overseeing land tenure used for apiary sites

Table 2

Land Tenure	Availability to Beekeepers (subject to certain conditions and permits)	Contact Authority
State Forest/ Timber Reserve	Yes	Forestry Plantations Queensland (FPQ) on plantation land within State Forest Department of Natural Resources and Water – Forest Products (NRW FP) on other parts of State Forest and Timber Reserve
Forest Reserve	Yes	NRW FP; in collaboration with Qld Parks and Wildlife Service (QPWS)
Resource Reserve	Yes	QPWS
Conservation Park	Yes	QPWS
National Park	No	QPWS
National Park (limited - designated for apiary purposes in Nature Conservation (Protected Area Management)	Yes – to 2024	QPWS
Reserves	Yes	Department of Natural Resources & Water (State Land Asset Management) NRW - SLAM
Roads and (stock routes)	Yes	NRW - SLAM
Unallocated State Land	Yes	NRW - SLAM
Leasehold	Yes	Landholder/Lessee
Roads (Main Roads)	Yes	Main Roads (MR)
Powerline easements (not state land)	Yes	Regional electricity authority and owner
Freehold (privately owned)	Yes	Owner

Source: (Lamb, 2005), Updated by EPA May 2007

5.3 Bushfires and Prescribed Burning

While fire plays an important role in natural and managed ecosystems, fires have the potential to impact on beekeeping through damage to the nectar resource, the impact of smoke on bee activity and the threat of damage to the hives. Smoke will cause the bees to retreat to the hive and limit their foraging activity until conditions clear.

The impact of bushfires on hives in forest areas depends on the maintenance and good "house keeping" of the site by the beekeeper. It is a condition of most apiary permits that beekeepers maintain a cleared area around the hives.

On State Forest lands, it is the responsibility of the beekeeper to inform the local park or forest officer when they are moving their hives onto a site, and to maintain contact with the local officer. Officers undertaking prescribed burning, or fighting a bushfire, can then take into consideration the location of the hives, and pass on relevant information to beekeepers.

Whether a prescribed fire is required for biodiversity conservation or fire mitigation purposes, the presence/location of the hives will be taken into consideration, along with other matters. As hives are usually located on sites along a road (fire trail), generally less than half the area being used by the bees would be impacted by any fire.

6 The research and development needs of the industry

6.1 Pollen Supplement Trial

In 2006, DPI&F conducted a pollen supplementation trial to identify possible protein sources that could be used as an alternative food source when access to natural pollen sources is unavailable. Successful identification of a viable alternative would not only provide substantial savings in transport costs but would also allow access to pollen deficient honey flows and provide a mechanism to build up or maintain hive strength in times of stress. No conclusive results were identified due to heavy rainfall during the trial period and further investigation is being considered. However the commercially available protein supplements appear to be effective as protein supplements when needed.

Recommendation 8

Opportunities for further research into alternative protein sources for bees should be investigated.

6.2 Disease related research

6.2.1 Exotic mite controls

Australia is currently one of the few remaining countries free of serious mites that infest bees. Varroa is probably the most serious ectoparasite of bees, but *Tropilaelaps* mite and Tracheal mites are also significant threats to bee and hive health.

Recommendation 9

Research areas that should be considered are:

- ***Breeding of mite resistant bees***
- ***Biocontrol methods***
- ***Effective chemical controls***
- ***Methods to counter chemical resistance development in mites***
- ***Improved surveillance/detection methodology (as these mites are hard to see and lab processing capacity for miticide strips and bee samples would quickly be outstripped if any of these mites entered Australia)***
- ***Locating and destroying feral bee hives***

6.2.2 Exotic disease

Several new problems have emerged in the USA in recent years. Colony Collapse Disorder (CCD) has seriously reduced the number of bee colonies in the US (destroying 25% of an estimated 2.4 million commercial bee colonies). The cause is unknown as yet and it may be a combination of several diseases and pests. A new species of spore forming protozoa *Nosema* (*Nosema ceranae*) has recently been causing hive losses in the US.

Recommendation 10

Research could include:

- *Development of diagnostic techniques*
- *Methods to enhance early reporting of unusual disease in hives*
- *Methods to destroy/sterilise hives exposed to disease.*

6.2.3 Endemic disease/pest control measures

SHB is the most recent pest of bees to be detected in Australia. It can cause a lot of damage to hives and the problems are likely to increase as the pest continues to spread e.g. it has only recently been found in north Queensland. American foulbrood (AFB) continues to be a serious apiary issue. Invasion of hives by black ants and predation of bees by toads are also issues.

Recommendation 11

Research could include:

- *Alternative methods to chemicals to control SHB*
- *Use of sniffer dogs to detect diseases while they are still at low levels in the hive and able to be more effectively managed*
- *Methods to control black ants*
- *Disease/pest epidemiology*

6.3 Industry viability related research

6.3.1 Alternative protein sources

Hives can be depleted especially when the bees are very active e.g. when providing pollination services. Historically many beekeepers have relied on access to native eucalypts in State forests and other public lands for suitable high quality nectar and pollen to build up their hives. Declining access to public land plus prevailing drought means that alternative sources of protein will need to be found to maintain the viability of hives and, in the long term, the stability of the industry.

Recommendation 12

Research could include:

- *Identification of synthetic protein sources*
- *Assessment of the value of alternative flower resources*

6.3.2 Chemical poisoning

Chemical poisoning of bees is an issue for farmers growing crops, vegetables, and fruits who may not recognise that bees can be killed as well as unwanted insect pests.

Recommendation 13

Research could include:

- ***Development of chemicals not toxic to bees***
- ***Determine how chemicals such as imidocloprid and other synthetic nicotinamides have a toxic effect on bees***

6.3.3 Medihoney

DPI&F has undertaken research into the anti-bacterial properties of honey and its potential treatment of wounds. Problem micro-organisms in the food industry and medical environment (eg *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli*, *Streptococcus*, *Bacillus circulans*, *Bacillus cereus*, *Yersinia enterocolitica*, *Listeria monocytogenes* and *Micrococcus*) were shown to be susceptible to honey. Honey had proved effective in the treatment of infantile gastroenteritis, and in effectively inhibiting *Helicobacter pylori*, the causative organism of acute gastritis and relapse of duodenal ulcer. There had also been many reports of the effectiveness of honey used as a topical treatment for a wide range of wounds, ulcers, burns and abscesses.

This research was assisted by financial support from the Rural Industries Research and Development Corporation (RIRDC) and discovered that a jelly-like honey from stands of *Leptospermum* trees in northern New South Wales has particularly potent anti-bacterial activity, important in the treatment of wounds.

This honey, under the commercial name of Medihoney, has been approved for limited use in hospitals in Queensland.

7 Existing industry and Government work that has been undertaken for the honey bee industry

7.1 Extension Services

7.1.1 Publications

The Queensland Government has been active in producing a number of publications to assist producers:

- Warhurst, P. and Goebel, R. (2005) *The bee book - beekeeping in Australia* 2nd ed Department of Primary Industries and Fisheries, Brisbane.
This is a general text on beekeeping with information on endemic and exotic diseases and chemical poisoning of bees as well as pests of bees. Peter Warhurst is a Senior Apiary Officer, DPI&F based at Warwick.
- *Honeybee Ute Guide* (in progress)
This a small reference book of pests and diseases (endemic and exotic) and problems affecting honeybee hives in Australia. It is intended to be a quick reference that can be carried in the field to assist to identify problems and improve the recognition and reporting of possible exotic diseases and pests.
- Blake, S. T. and Roff, C. (1988) *Honey Flora of Queensland* 3rd Edition Department of Primary Industries and Fisheries, Brisbane.
This book describes plants important to beekeepers in Queensland. It is a re-vamp of the long out-of-print Honey Flora of South-eastern Queensland. It includes additional information of interest to any naturalist, and no doubt vital to beekeepers, such as flowering times and the value of the flowers in honey production. Although originally written for south-eastern Queensland, new sections cover beekeeping areas in coastal central Queensland, north Queensland and the Paroo district, making the book useful for the whole of Queensland.
- Lamb, Hamish (2005) *Guidelines for Rural Beekeeping in Queensland* State of Queensland Department of Primary Industries and Fisheries at <http://www2.dpi.qld.gov.au/bees/16929.html>
These guidelines were prepared by the DPI&F Apiary Section in consultation with the beekeeping industry, Queensland Beekeeping Association (QBA), recreational beekeeping associations, Environment Protection Authority (EPA), Department of Natural Resources and Mines (NR&M), DPI&F, DPI Forestry, Queensland Health, Department of Equity and Fair Trading, and Department of Main Roads.
- Lamb, Hamish (1998) *Code of Practice for Urban Beekeeping in Queensland*, Information series: Q198044, Department of Primary Industries at <http://www.honeybee.com.au/cop/>
This code forms the basis for harmonious cooperation between beekeepers and other land occupiers in Queensland. The aim of the code is to ensure that the keeping of honey bees does not have a negative impact on people, property, domestic animals or native flora and fauna.
- Production and distribution of fact and information sheets on diseases and pests of honeybees.

7.1.2 Website

DPI&F has developed and continue to maintain an extensive web site with information for Queensland beekeepers covering the following topics:

- Beekeeping essentials: legislation, registration, resources, suburban beekeeping.
- Hive management: equipment, honey extraction; and
- Diseases and pests: threats to hive welfare and general environment.

7.1.3 Workshops/Field days

Monthly information sessions for beekeepers are conducted by DPI&F apiary staff. These sessions are held around south-east Queensland where the majority of beekeepers reside.

7.2 Research & development

The focus of recent DPI&F research into the honey bee industry has mainly been centred on biosecurity issues and includes:

- Small black ant control in apiaries using fipronil.
- Honeybee abatement using ivermectin.
- Feasibility study into in-hive fungal bio-control of small hive beetle (currently being considered for funding by RIRDC).
- Ability of Queen bees to transmit American foulbrood.
- Transmission of American foulbrood of honeybees through replacement of Queen bees.
- Investigation of disappearing disorder of honeybees.
- Natural Resource Database for the Queensland Apiary Industry.
- Investigations into Disappearing disorder, a problem of honeybees in south-east Queensland.

There have been a number of industry development focused research projects including:

- Field evaluation of a new bee protein supplement.
- Medical attributes of honey.
- A Quality Survey of Australian Honeys.

7.3 Biosecurity services

7.3.1 Laboratory services

DPI&F maintains a laboratory capability to undertake diagnostic testing and support surveillance for pests and diseases:

- Bacteriology services e.g. honey testing for AFB diagnosis.
- Entomology services to identify exotic bee species.
- Parasitology services to monitor for exotic bee mites.

7.3.2 Pest and disease surveillance

DPI&F is involved in ongoing surveillance for bee pests and diseases. Some specific examples are indicated below:

- Surveillance to define the extent of SHB in Queensland when this bee pest was first identified in Australia. DPI&F apiary officers also provided advice on the possibility of eradication. Ongoing advice into the management of SHB by industry continues to be supplied.
- Surveillance for exotic bee mites including managing the National Port Sentinel Hive Program in Queensland.
- Surveillance for exotic bee species (particularly at the Port of Brisbane).
- General and targeted surveillance for disease and pests, national reporting (necessary to meet international reporting obligations and support overseas market access for Australian bees and bee products).

7.3.3 Pest and disease control, management and emergency responses

- Disease response capability to respond to outbreaks of new or emergency diseases or pests of bees.
- Health certification of bees and hives for movement interstate and for export.
- Monthly information sessions for beekeepers (spread around Queensland but mainly in south-east Queensland where most beekeepers reside).
- Bees are covered in the emergency response capability of Biosecurity Queensland. Bee pests and diseases are covered in the Emergency Animal Disease Response Agreement which enables an initial response to be undertaken and funded under an agreement between government and industry.
- Input into the AUSVETPLAN disease strategy for the bee diseases and pests and ongoing input as the strategy is reviewed in the future.
- Management of abandoned and diseased hives.

7.4 Industry consultation

The Bee Industry Consultative Committee was established to provide a formal link between State beekeeping organisations and relevant Queensland Government departments. This Committee meets twice a year and provides a forum for discussion on strategic issues and encourages cooperation and coordination between Government departments and the apiary industry on industry matters. The Committee is currently chaired by industry and includes representatives from:

- Environmental Protection Authority (EPA)
- Queensland Parks and Wildlife Service (QPWS)
- Department of Primary Industries and Fisheries (DPI&F)
- Department of Natural Resources and Water (NR&W)
- Department of Main Roads (MR)
- Queensland Beekeepers' Association (QBA)
- Recreational Beekeeping Associations
- Queensland Health, Environmental Health Section
- Department of Equity and Fair Trading, Trade Measurement Section

8 References

- Capilano Honey (2006) *Capilano* at <http://www.capilano.com.au/aboutus/index.aspx>
- DPI&F (2004) *Guidelines for rural beekeeping in Queensland* Department of Primary Industries and Fisheries at <http://www2.dpi.qld.gov.au/bees/16929.html>
- DPI&F (2006) *Industry Overview Apiculture – Honey Production FarmBis* Department of Primary Industries and Fisheries at <http://www.farmbis.qld.gov.au/files/pdf/Bees%20-%20March%2006.pdf>
- Department of State Development and Innovation (2004) *Feasibility Study Alternative Melliferous Resources for Southeast Queensland Apiculture Industry* prepared by Max Winders & Associates Pty Ltd Consulting Engineers and Environmental Scientists, Brisbane
- Gibbs, D.M.H. and Muirhead, I.F. (1998) *The Economic Value and Environmental Impact of the Australian Beekeeping Industry*. Australian Honey Bee Industry at <http://www.honeybee.com.au/Library/gibsmuir.html>
- Lamb, H (2005) *Guidelines for Rural Beekeeping in Queensland* State of Queensland Department of Primary Industries and Fisheries at <http://www2.dpi.qld.gov.au/bees/16929.html>
- Morley, P. (2007) *Alarm at bee killer* The Courier Mail May 5-6, 2007 p.38
- Weatherhead, Trevor (1986) *Boxes to Bar Hives Beekeeping History of Queensland* International Colour Productions, Stanthorpe
- Zinn, C. (2007) *Bee keepers appeal for industry help* TV Program Transcript Australian Broadcasting Corporation at <http://www.abc.net.au/7.30/content/2006/s1618598.htm>

Appendix 1

Registered beekeepers by groups as of April 2007

No. of Hives	Beekeepers per Group	% of Beekeepers	Total number .of Hives	% of Hives
0	45	1.46%	0	0.00%
1-24	2 424	78.75%	14 441	12.11%
25-49	228	7.41%	7 46	6.41%
50-249	274	8.91%	28 451	23.86%
250-499	52	1.69%	19 258	15.31%
500-749	30	0.97%	17 360	14.56%
750-999	12	0.39%	10 010	8.39%
1000+	13	0.42%	23 084	19.36%
Total	3 078		119 250	

Source: Biosecurity Queensland Bee Industry Register Database, Warwick