# Eradicating American foulbrood from NZ

By Dr Mark Goodwin, Team Leader Pollination and Agriculture, Plant and Food Research, Ruakura Research Centre. Email: mgoodwin@plantandfood.co.nz

New Zealand beekeepers are currently trying to eradicate American foulbrood disease (AFB)—a disease of honey bees.

Although this is something that no other significant beekeeping country has ever tried to do, New Zealand has a history of eradicating diseases; e.g., hydatids. Interestingly, the idea of eradicating AFB is not new to New Zealand beekeepers.

This from Volume 1 of the *New Zealand Beekeeper* 1939:

the disease can and should be eradicated completely. Under the present system which has had many years' trial elimination of disease from all apiaries in New Zealand seems to be as far away as ever and it certainly high time that something more definite was done about it.

## Why is the goal to eradicate AFB from New Zealand desirable?

- 1) Once eradication is achieved there is no need to invest in AFB control.
- By looking for AFB and burning infected colonies, New Zealand beekeepers have an eradication policy for their own hives. It therefore makes sense for the New Zealand beekeeping industry to have the same strategy.
- Feeding antibiotics to control AFB is not sustainable long term. Many countries are currently finding that AFB is becoming resistant to the antibiotics being used.

### Why is eradication possible?

 AFB is difficult to spread. Large numbers of bacteria (500 million spores/litre) need to be fed to a colony to cause an infection. It is therefore not necessary to eradicate the bacteria itself, which is probably impossible, but just to reduce the number of bacteria to a point that the infection of new colonies is unlikely to happen.

- Many beekeepers have eradicated AFB from their own outfits. If some beekeepers can do this, then it is possible for all beekeepers to do so.
- One problem for eradication is that the feral bee population cannot be inspected for AFB. However, every cloud has a silver lining. Thanks to varroa, the feral honey bee population is being eliminated.
- 4) Another benefit of varroa is that it is changing beekeeping practices. Those beekeepers not really interested in keeping bees have lost or sold their hives. Also, many beekeepers managing large numbers of hives per labour unit are reducing their hive numbers to better control varroa, which also means they have more time to control AFB.
- New Zealand is an island, therefore not subject to continual re-invasion once AFB has been eradicated.
- Most AFB is spread by beekeepers, so changes in the way beekeepers manage hives can have a dramatic effect on AFB levels.

## So how can eradication be achieved?

Eradication can be achieved through a combination of two approaches:

- the traditional approach of trying to find and burn AFB hives faster than beekeepers can infect new hives. The approach taken is to have every hive inspected each year by someone capable of recognising AFB. This is achieved by a combination of training beekeepers, approved beekeepers carrying out the inspections and compulsory inspections. Assuring that all hives are thoroughly inspected each year at an appropriate time of year could, by itself, result in eradication.
- educating beekeepers to reduce the rate with which new hives are infected.

As long as more AFB hives are found and burnt than are infected each year, eradication will happen: the only question is how quickly. The trick is to get the right balance between search-and-destroy and prevention of infection.

## What could stop eradication being achieved?

There are a number of threats to eradicating AFB:

- as far as we can determine, we do not have European foulbrood (EFB) in New Zealand. When we get EFB, we will need to feed antibiotics to control it. The use of antibiotics can, at times, make it more difficult to diagnose AFB
- 2) politics are also a threat. When everyone was part of the same beekeeping organisation, whether they wanted to be or not, there was little incentive for beekeepers to use the eradication programme for political gain. However, now that the beekeeping industry is splintered into a number of organisations competing for beekeeper members, there is a larger risk that the programme will be damaged by beekeepers seeking political advantage
- if the eradication programme is not well managed and objectives of the programme are not met, beekeepers will lose their enthusiasm for carrying it out
- if the participants in the eradication programme forget that reducing the spread of AFB is at least as important as trying to find infected colonies, eradication will not be achieved.

The final eradication may be difficult. It will certainly need a new approach. Once AFB has been isolated to some small areas, strategies like extensive inspections and investigations into hive movements can be used to track down the last infected colonies.

In the end, eradication can only be achieved by beekeepers, both commercial and hobbyist. Most AFB is found and destroyed by beekeepers and most AFB is spread by beekeepers. No outside agency can do it for beekeepers; it can only assist them. For this reason, AFB eradication is about changing beekeepers' beekeeping behaviour.

[Editor's note: This is the eleventh article of a series that has been written for the Management Agency for the American Foulbrood National Pest Management Plan. These articles were first published beginning in 2003, and have been reviewed and updated where necessary. The original title was 'Eradicating American foulbrood from New Zealand'.

We will run the last of the twelve articles in an upcoming issue. The articles cover a range

of aspects of American foulbrood control, including how to inspect for and identify diseased colonies, the management of colonies to prevent American foulbrood and a beekeeper's legal obligation with regard to American foulbrood.]

### AMERICAN FOULBROOD NATIONAL PEST MANAGEMENT PLAN

## ADR, COI and AFB statistics

By Rex Baynes, AFB NPMP Manager

### Annual Disease Return (ADRs)

Compliance levels

Year	Registered beekeepers	% ADRs received	
2000	4,864	85.0%	
2001	4,550	70.0%	
2002	3,973	75.0%	
2003	3,649	70.0%	
2004	3,211	79.0%	
2005	2,911	82.0%	
2006	2,694	84.0%	
2007	2,602	83.0%	
2008	2,589	91.0%	
2009	2,663	96.7%	
2010	2,957	93.3%	
2011	3,265	92.4%	
2012	3,802	92.3%	
2013 (Jan)	4,127	92.0%	

**Comment:** Despite an increase of some 1,500 new beekeepers since 2008, the Management Agency has managed to maintain compliance levels above 90%.

### Increased compliance equates to increased reporting

It is important to recognise that with increases in Annual Disease Return and Certificate of Inspection compliance, there is a counterreaction in terms of increased AFB reporting, notwithstanding also that beekeeper and hives increase.

### Certificate of Inspection (COI)

Compliance levels

Year (as at June)	Beekeepers	Compliance rate
2004	845	13%
2005	741	14%
2006	577	18%
2007	534	22%
2008	537	30%
2009	1090	29%
2010	1298	64%
2011	1286	77%
2012	1552	70%
2013 (As at Feb)	1494	55%

#### Reported incidents of AFB

Year (June to May)	Reported AFB cases	Number of apiaries	Percentage
2003-2004	870	422	0.30%
2004–2005	778	421	0.26%
2005–2006	952	482	0.32%
2006–2007	954	540	0.30%
2007–2008	980	552	0.27%
2008–2009	1117	557	0.32%
2009–2010	515	348	0.16%
2010–2011(Jun to Mar)	722	321	0.19%
2011 (Jun)	1093	579	0.28%
2012 (May)	762	499	0.18%
2013 (Feb)	961(*)	505	0.21%

Notes: Percentage figures taken per hive.

(\*) 140 of this total relates to one beekeeper.