

Elimination of American Foulbrood from New Zealand

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This article is the first of a series of articles written for the Management Agency for the American Foulbrood (AFB) Pest Management Strategy. The aim of these articles is to assist beekeepers in eliminating American foulbrood from their beehives. Much of the content of these articles will be drawn from the AFB elimination manual.ⁱ

Part 1. History of American Foulbrood control in New Zealand

It is useful to understand the history of AFB control in New Zealand when considering what we intend to do in the future. The aim of AFB control in New Zealand has changed several times this century. It is difficult to determine the intent of AFB control in the early part of the century as it was unrecorded. However, much can be inferred by studying what people did. An example of this can be seen from the writing of Isaac Hopkins.

The districts in which the Ruakura State Apiary is situated were amongst the worst in the Dominion for foulbrood. The colonies I started the State Apiary with

that were already on the farm were affected. By constant attention and treatment we were able to keep the disease from spreading and when we left for the Christchurch Exhibition (1906) there were six out of over 70 slightly affected with foulbrood. When we returned in the following June we found the disease had spread through robbing to nearly every colony. Early in the following season we treated a number of the worst cases and replaced bad with clean combs. As this did not turn out so satisfactory as we hoped, I hoped to treat the whole of the colonies the next spring.ⁱⁱ

From the approach taken by Isaac Hopkins it can be concluded that the intent was to control the disease through management rather than to eliminate it. People's ideas on the subject had changed by 1939 as this quote from the Editorial of the New Zealand Beekeeper indicates.

'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 is certainly high time that something more definite was done about it.ⁱⁱⁱ

And in a remit from the executive to the 1939 conference.

'It is also contended that in the event the Department (of Agriculture) got right down to thorough inspection co-opting the services of reputable beekeepers in every district and ensuring that diseased hives were destroyed on sight under proper supervision it could be eradicated from the country within a period of five years.^{iv}

From these comments it can be seen that the beekeeping industry in the 1930's and 40's had the aim of eliminating AFB from New Zealand. Also, that disease control was seen as the responsibility of Government rather than of beekeepers. This idea that AFB control is a government responsibility was popular in the industry up to the 1990s.

Some time between 1940 and 1990 the idea of eradicating AFB from New



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Zealand seems to have been lost. Although beekeepers attempted to eradicate AFB from their own outfits the official Government AFB control programme talked about control and containment rather than eradication. With the increasing disease levels between 1960 and 1990 (Fig 1), the programme was not even achieving the goal of control.

When, in the early 1990's the Government announced it's intention to repeal the sections of the Apiaries Act, which was being used to control AFB, the National Beekeepers' Association, and beekeepers, were forced to recognise that they were responsible for AFB control. Beekeepers have always accepted responsibility for eliminating AFB from their own hives (some better than others) but now they had to accept responsibility of AFB in other beekeepers' hives as well. Previously this was seen as a MAF problem. The Association had to decide on a strategy for dealing with AFB, or face the prospect of no legal controls on AFB.

The NBA established a committee to formulate a goal for AFB control in New Zealand. The committee asked for submissions from the industry and from these decided that elimination of AFB from New Zealand was the most reasonable approach. As can be seen from the above, the goal was of course nothing new.

So why choose eradication for a Goal? I think the best explanation I have come across is because every beekeeper (well almost every) is already trying to eradicate AFB from their own beekeeping outfit. The NBA had to have the same goal as the members of the NBA.

While deciding on the future of AFB control in New Zealand, beekeepers have come to accept, perhaps for the first time, that AFB control was never a responsibility of Government. More than 95% of AFB control has always been carried out by beekeepers with Government Inspectors only making a very minor, although valuable, contribution.

So, is the goal of eradication possible? As some beekeepers have successfully eliminated AFB from their own hives it is possible for most, if not all, beekeepers to do the same. The Pest Management strategy recognises that beekeepers are the only people capable of eliminating AFB from New Zealand and endeavours to provide beekeepers with the tools to carry this out.

Incidence of American Foulbrood in New Zealand

American foulbrood was first recorded in New Zealand in 1877, 38 years after honey bees were introduced. Within 10 years, the disease had spread to all parts of New Zealand and was being blamed

for a 70% reduction in the nation's honey production.^v

Information on the numbers of beehives infected with the disease was not recorded during the early period of beekeeping development in New Zealand. Part of the reason was that beekeepers attempted to manage the disease rather than destroy infected hives.

In 1950, it was decided that the incidence of AFB could not be reduced further if shook swarming continued to be used. Beekeepers were therefore instructed by the Department of Agriculture to "destroy the contents of diseased hives and to sterilise thoroughly any remaining hive equipment by approved methods."^{vi}

The first reliable report on the incidence of AFB in New Zealand was in 1947, when 74% of hives were inspected and 1.7% were found to be infected with AFB. In 1950, 78% of the hives were inspected with 2.02% found to be infected.

There were no reliable AFB disease statistics collected between 1950 and 1960. By 1961, however, the incidence of AFB had reduced to 0.23% of hives. The decline in disease levels during the 1950's was probably due to the move away from shook swarming (managing AFB), and the adoption of the practice of destroying diseased hives.^{vii}

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The percentage of beehives reported to have AFB increased over the next 30 years, reaching a peak of 1.2% in 1990 (Fig 1).

The NBA instituted an American Foulbrood Control Programme in 1991. The programme included the inspection of approximately 4% of the nation's apiaries by government inspectors, voluntary inspections carried out by NBA branches (called 'diseaseathons'), the counselling of beekeepers with AFB problems, a research programme elucidating the factors contributing to the spread of AFB and an extensive education programme. During the seven years the programme was in existence, the reported incidence of the disease decreased by an average of 12% per annum, reaching a low of 0.38% in 1998, the last year of the programme (see Figure 1).

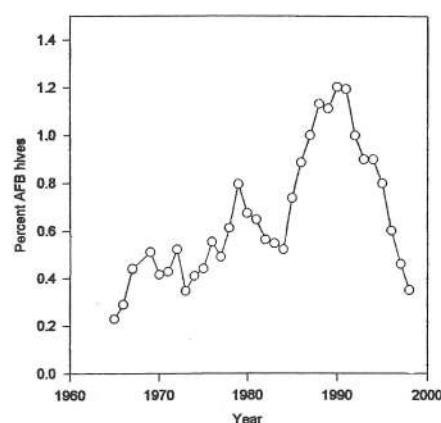


Figure 1. The percentage of hives in New Zealand reported to have AFB each year.

Although New Zealand's AFB disease statistics are more comprehensive than most, the information must still be treated with caution. The figures rely heavily on information provided by beekeepers to the Ministry of Agriculture. Even though it is a statutory requirement in New Zealand for beekeepers to report diseased colonies, in the past:

- Not all beehives were inspected,
- Not all AFB infections were detected in those beehives that were inspected, and
- Not all cases of AFB were reported when found.

New Zealand AFB statistics are therefore an underestimate of the actual disease levels.

The decrease in disease levels does however appear to be real. This can be seen by looking at the percentage of AFB hives found by MAF over the last 7 years (Fig 2). The percentage of AFB hives found are higher than the national statistics because the MAF inspections were carried out in areas that they expected to find AFB hives. They have however been decreasing, as have the national statistics.

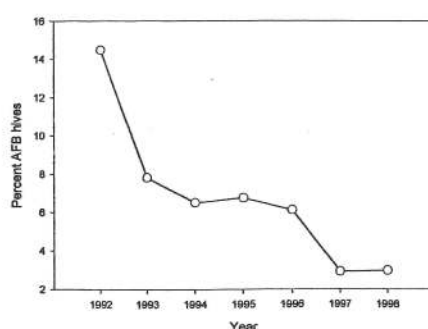


Fig. 2 Percentage of hives inspected by MAF each year that had AFB.

Relationship between AFB hives and hive holdings

Commercial beekeepers often assume that beehives belonging to part-time beekeepers are more likely to have AFB, since many of these beekeepers have limited experience in AFB recognition and inspection.

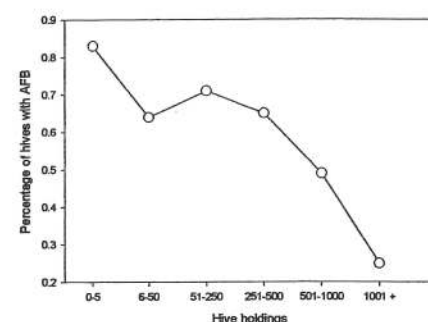


Figure 3. Annual percentage of AFB hives found for beekeepers with varying numbers of hives.

This assumption is supported by an analysis of New Zealand AFB statistics that shows that the fewer beehives belonging to a beekeeper, the greater the percentage of those hives are likely to be infected with AFB (Fig. 3). Beehives belonging to beekeepers with a less than 5 hives had a 0.8% AFB incidence compared to hives belonging to beekeepers with more than 1000 hives that only had a 0.25% AFB incidence. However, the beehives belonging to beekeepers with 5 or less hives only account for 5% of the AFB hives reported each year (Fig. 4).

Because commercial beekeepers with more than 500 hives own most of the beehives in New Zealand, these beekeepers also have over half of the AFB hives. Beekeepers with larger hive holdings tend to also have more experience finding AFB, since 70% of them find at least one of their hives infected with AFB each year, compared to about 1% of beekeepers who own less than five hives.

In conclusion, we have the lowest incidence of AFB we have had for 30 years, and if the current trends continue, we will likely have the lowest incidence we have had this century. We are now destroying 2,700 (69%) less hives than

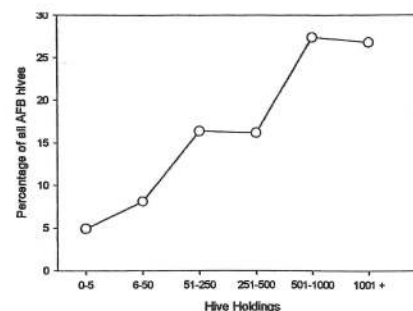


Figure 4. Annual percentage of hives reported to have AFB that are owned by beekeepers with varying hive holdings.

we were destroying nine years ago. This is a saving of \$270,000 p.a. in hives which does not include the cost of destroying these colonies or lost production from them. The necessary powers and responsibility to control AFB has now been taken away from Government and placed in the hands of beekeepers with whom it should always have been vested as beekeepers have always done the majority of disease control and are the only group that could ever eradicate AFB from New Zealand.

I've really got a problem with starting an AFB eradication manual with reports of successful control of AFB using shook-swarming. What message are you trying to convey to readers?

ⁱ Goodwin, R.M.; Van Eaton, C. 1999: Elimination of American Foulbrood without the use of drugs, a practical manual for beekeepers. National Beekeepers' Association of New Zealand (inc.) 78p

ⁱⁱ Hopkins, Issac. 1915. Forty two years of beekeeping in New Zealand 1874-1915, some reminiscences. New Zealand Farmer reprint, 38 pages. Serialised in New Zealand Beekeeper. 1974. 36(1):35-43; 36(2):60-66; 36(3):44-47.

ⁱⁱⁱ Anonymous 1939 Editorial, Disease control: New Zealand Beekeeper April: 1-7

^{iv} Anonymous 1939: Disease control twenty years ago and now. New Zealand Beekeeper July: 12-16

^v NZ Parliament, 1891. Foul brood in bees. Hansard. Wellington, NZ. August 19.

^{vi} Anonymous. 1950. New Zealand Beekeeper 12(3): 16.

^{vii} Winter, T.S. 1954. Conference address by Mr. T.S. Winter, Superintendent, Beekeeping Industry. New Zealand Beekeeper 16(3): 19-24.

*** Please don't tidy my mess, you'll only confuse me and mess up my life!!**