HOW BEEKEEPERS SPREAD AMERICAN FOULBROOD DISEASE

Dr Mark Goodwin
HortResearch
Ruakura Research Centre
Mgoodwin@hortresearch.co.nz

Without the intervention of beekeepers, American foulbrood disease (AFB) probably spreads quite slowly. However modern beekeeping practices have increased the number of opportunities for AFB to spread. This article describes the way beekeepers contribute to the spread of AFB.

Swapping brood

The most significant way beekeepers spread AFB is moving frames of brood between colonies. Although you need to feed about 5 million spores to a colony to infect it with AFB, a single diseased larva may contain 2,500 million spores. If you wanted to infect a colony the most certain way of doing so would be to place a frame of brood from a diseased colony into it. There are many examples where beekeepers have created significant disease problems by swapping brood. Many of these have occurred while preparing hives for kiwifruit pollination.

Feeding pollen

This is another high risk activity. The design of most pollen traps ensure that many of the AFB scales that bees remove from a hive end up in the pollen trap with the pollen. For this reason feeding pollen can be another very good way of spreading AFB.

Feeding honey

Feeding extracted honey contaminated with AFB spores is also high risk. There are many horror stories where beekeepers have had to burn large numbers of hives after feeding extracted honey.

Extracted honey supers

Even though extracted honey supers usually contain less infected material than brood or pollen they are a major source of cross infection. This is because of the frequency with which they are swapped between hives. In most commercial outfits they are taken off one hive and placed on another hive at least once each year. Some large reductions in disease levels have been achieved by making sure extracted honey supers are returned to the hives they were removed from. The best indicator that extracted supers are spreading AFB is through a scattered occurrence of the disease with no pattern to it.

Other hive parts

Swapping other hive parts can also spread AFB. This can be a problem when a dead hive is broken up for parts. The floorboard is usually the biggest problem because bees often drop infected material on it

Robbing

Bees robbing honey from an infect colony is another major way AFB spreads (Fig. 1). In most cases beekeepers have contributed to the problem, either by allowing an infection to get to the stage that the colony is weakened enough to be robbed, allowing a diseased colony to die of other causes, or by not protecting it from stock so that it gets knocked over and robbed. Unfortunately, robbing also occasionally happens when an AFB hive is killed and stored in an inappropriate manner.

Fig 1 A colony being robbed

Drift
Bees drifting between hives is a lesser source of cross infection but still significant. The likelihood of drift increasing spread increases with the degree of infection and the amount of drift that occurs. Anything that can be done to reduce drift is usually worth while doing.

The remaining pathways with which AFB spreads are less important.

Beekeeping equipment.
Bee suits, gloves, and hive tools have at times been implicated in the spread of AFB. Bee suits probably never spread AFB, although gloves and hive tools may do very occasionally. It is therefore good practice to have a clean pair of gloves that can be worn after an AFB colony has been found so the infected gloves can be taken home and cleaned thoroughly. Hive tools can be cleaned on site using a flame.

Other mechanisms for spread
There have been a large number of other mechanisms suggested to be important for the spread of AFB including, truck decks, steering wheels, hive straps, queens, queen cells, foundation, flowers and the soil outside a hive. Although some of these may occasionally pose a small risk they are so insignificant compared to the other ways the disease spreads, they can usually be safely ignored.