American Foulbrood Disease. Part IV. Control.

by Mark Goodwin

In order to manage colonies to reduce American foulbrood (AFB) disease levels it is important to understand one basic concept. This is that most AFB infections of colonies are due to beekeeping practices. If your disease levels are remaining stable you are probably infecting clean colonies at the same rate that you are finding and destroying diseased colonies. You can alter the disease situation of your hives for better or worse by either modifying the number of effectiveness of your disease inspections or changing management practices which may either increase or decrease the rate of spread of the disease. For example a change in any of the following may affect disease levels.

Disease inspections

* The percentage of brood frames inspected
* The location in the hive of the frames inspected
* The frequency of inspections
* Whether the bees are shaken off first
* Ability of the inspector to identify disease larvae
* The timing of inspections.

1. Hive Management

* Amount of brood shifted between hives
* Exchange of wet or dry supers between hives.
* Frequency of robbing and drift
* Use of feed honey
* Speed with which diseased hives are destroyed
* The methods used to sterilise equipment.

The preceding lists are of course not complete but provide an idea of the complexity of the issue. The importance of each increase with the overall disease incidence. For instance increasing your disease incidence five fold from 0.5% to 2.5% might be painful however increasing it from 5% to 25% might be disastrous.

The list also demonstrates that there are a large number of factors that can be worked on to reduce disease levels. The choice of which are selected probably depends on the importance placed on reducing disease levels.

There are a number of possible options for inspection programmes and hive management.

INSPECTIONS

The first step is to ensure that you and your staff can recognise a larva with American foulbrood disease.

The first basic rule in inspecting colonies is that you cannot inspect brood frames for disease unless you shake the bees off first. The second rule is that the more brood frames you check the more likely it is that you will identify an American foulbrood infected colony. Although they take a lot of time, complete brood inspections are a very valuable tool.

Obviously the more frequently you inspect colonies the greater the probability that you will identify any diseased colonies that are present. However there are certain times when failure to identify a disease colony may prove to be particularly expensive. Such as when you are removing something from a hive that may be placed in or on another hive. e.g. brood, honey supers, bees or empty supers. It is best to target your inspections for these times. If your hives have a disease problem probably the best advice that you will get is to do a complete brood check before you remove anything from any hive, especially when you are removing honey supers. It may be a pain in the neck when you are trying to take honey off however it might save a lot of work burning hives later on.

One solution to the problem of trying to inspect at the same time as you remove honey is to number all your hives. This can be done quickly and cheaply with a felt pen. The number would only have to last a few weeks. When you remove your honey supers don't inspect for disease but write the number of the hive on every box as it is removed. Then come back and do a complete brood check before you extract the honey. Any boxes from infected colonies can then be removed as it turns up at the uncapper.

This said there are of course the legal requirements. This are to inspect, or have inspected, your colonies between the 1st of August and the 30th of November each year and to report any AFB found forthwith, along with sending in a statement of inspection including the yearly hive totals by the 7th of December. I am always surprised by the number of beekeepers I hear of that are in contravention of the act and do not report disease forthwith. If you read the act you will see that the notification must be in writing.

2. Culture tests

Colonies can have AFB disease without exhibiting any clinical symptoms[2]. It is possible to test samples of bees or honey from colonies for the presence of spores to indentify these colonies[1]. If a colony returns a positive test for AFB disease it should receive a complete brood check as soon as possible. If diseased larvae are found it must be destroyed. If no clinical symptoms of the disease is found it should be marked so it can be checked regularly.

If the overall incidence of AFB disease does not warrant the expense of testing every colony individually then composite samples of bees or honey (collected during extraction) could be taken from each apiary and tested. This information could be then used to target further inspections.

HIVE MANAGEMENT

There are three main types of management that can be usefully applied to controlling disease problems. These are hive, apiary or area quaratines. They all serve to limit the impact of hive management on the spread of AFB.

1. Hive quarantine

This is where each colony is managed by itself with no interchange of equipment between hives. It is usually only employed where there is a significant risk of anything that swapped between colonies being contaminated with AFB spores.

An example of this might be where a beekeeper has a 20% AFB incidence. The programme would consist of numbering every floorboard whether or not it is in use. This can be simply done by nailing a small sheep eartag on each flight board. When this is done every colony will have a unique number. From then on no equipment is swapped between colonies. Queen excluders, feecders, division boards etc either stay with the hive or are numbered when removed, extracted and the same frames placed back in the same super.

These are returned to the same hive in the spring.

This process is obviously very time consuming and requires the beekeeper to be very organised. However it can and has been used for commercial beekeeping operations and can have dramatic effects on reducing disease levels. Assuming all the available equipment is used on hives each year, comprehensive inspection and hive quarantine programmes are employed and these are few ouside sources of spores such as feral colonies, it should be possible to eliminate American foulbrood disease from an outfit in a couple of years.

Hive quarantines could be used for colonies that return a positive culture test but have no clinical disease symptoms. If there are a number of hives testing positive they could all be moved to the same apiary to reduce the possibility of them cross infecting other colonies.

2. Apiary quarantine

This is where each apiary is managed separately. This type of quarantine has been employed by beekeepers with a wide range of disease levels in their hives. Any equipment from an apiary is coded in some way and always remains with that apiary. It has the advantage that it is much less time consuming than a hive quarantine but can still be very effective. It is used as a matter of routine in some operations. If an AFB problem develops it will probably only effect the colonies in one yard rather than affecting the whole outfit. Some beekeepers use a modified system whereby they quarantine any apiary where an AFB hive is found and keep it in place until the apiary has been free of AFB for a specified time, possibly two-three years. Interestingly if you find an AFB hive in an apiary you are legally required to not remove anything from that apiary without the consent of an inspector.

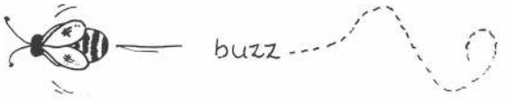
3. Area quarantine

This might consist of dividing an operation into two such as those apiaries with a recent history of AFB and those without. The two parts are managed separately with no interchange of equipment between parts. Apiaries may be added to the AFB free part if they remain free of AFB for a certain length of time or added to the AFB part if a colony develops AFB.

CONCLUSION

Probably the most effective way in which you can combat American foulbrood disease in your outfit is to conduct a complete brood inspection before you remove anything from a hive and reduce the exchange of equipment between colonies as much as possible.

1. Goodwin, R.M.; Perry, J.H., Hain, H.M. 1993: American foulbrood disease Part 1: The incidence of American foulbrood disease in New Zealand. *The New Zealand Beekeeper Autumn:* 19-20.
2. Goodwin, R.M.; Perry, J.H., Haine, H.M. 1993. American foulbrood disease Part 2: Subclinical Infections. *The New Zealand Beekeeper Winter:* 7 - 9.



THOUGHTS ABOUT HEALTH FOODS

from George Nichols

We have made a big mistake in marketing "pure" honey while the rest of the food market has gone in for expensive additions and subtractions.

Let us try some additions, how about pollen? We can shake a very obvious dusty layer on top of our pots from the local pine trees or privet bushes. How about vitamin enriched honey? Our diet is already loaded with too much of everything including vitamins, yet the local chemist's shop will gladly sell us an even greater excess which, luckily, passes straight through us. Not the fat soluble ones.

Then we can put royal jelly into honey and add a rumour on the label hinting at male fertility. As an alternative to royal jelly for the Far Eastern market we can add ground up deer horn, or even rhino horn if the Auckland zoo will oblige. I will offer to lend them a suitable rasp but I am not very certain if I have time to help with the job. Honey toffee with propolis should sell well, then cappings' wax could be added though I am not sure what for but the faddy feeders can, no doubt, find something marvellous. A brilliant thought suddenly struck me, we must add bran to our "Regular" honey. Another additive which might be tried is hydrogen, long ago when I was a student we added hydrogen to vapourised cottonseed oil using a nickel catalyst and margarine came out of the end. Now margarine has a reputation for being entirely "Natural" whatever that means so we could try adding hydrogen to hot honey to see what happens.

The other end of the food fad market extracts most of the nutriment from food - no cholestrol - no kilo calories - no - fat - sugar reduced. Can we extract laevulose or dextrose from honey, sell the resultant remains at an inflated price and then sell the laevulose or dextrose back to the gullible public, this is rather like selling a nationalised industry back to the tax payer who thought he already owned the industry. In the extreme case we could sell honeyless honey water with only the smell remaining. Slimmers take note, you can be slim enough to wear your daughter's knickers!

Now, here are some suggestions for advertising our products. We must have television advertising programmes with extremely healthy young women who, for some totally unknown reason, know facts about honey which are hidden from men. This would go down well in Womens' Suffrage Year. For royal jelly honey we need a nubile young woman having a romp with a elderly beekeeper. Voice from behind my back "That's just wishful thinking, be your age George." " That's the trouble, I am my age!"

Finally a short poem: (voice from the back "Oh good, we've got there at last.)

On Diet

Cholestrol is poisonous so never, never eat it.
Sugar too may murder you, there is no way to beat it.
And fatty food may do you in, be certain to avoid it.
Some food is rich in vitamins but processing destroys it.