

AMERICAN FOULBROOD CONTROL

This is the first article of a series that has been written for the Management Agency -for the American Foulbrood Pest Management Strategy. These monthly articles will 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.

INSPECTING HONEY BEE COLONIES FOR AMERICAN FOULBROOD DISEASE

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The most common reason why beekeepers have an American Foulbrood disease (AFB) problem is because they, or their staff, use incorrect techniques for carrying out disease inspections on their colonies. This article deals with how to inspect colonies.

Although not a reliable diagnostic method, be particularly suspicious of any colony that has not been performing as well as the other colonies in the apiary. Their poor performance may be due to one of a number of other causes but may be due to a large number of larvae having been killed by American foulbrood disease.

When inspecting a colony for AFB it is important that the method used is capable of detecting a single infected larva or pupa if it is present. The presence of a single diseased larva in a colony means that the colony is infected with American foulbrood disease and legally must be destroyed. The Management Agency for the AFB Pest Management Strategy must be notified within 7 days. More importantly a single diseased larva contains enough spores to infect up to 500 hundred other colonies. For this reason it is important to check each brood cell in a hive. The risk of failing to find the diseases by

only inspecting a few brood cells within the hive can be estimated quite easily. Assuming a hive has 10 frames containing brood and one diseased larva, an inspection of one frame means there is a 90% probability of missing the diseased larva and not recognizing that the colony is infected. Inspecting 3 frames still means there is a 70% chance of missing a diseased larva.

When inspecting hives inspect every brood frame

Most beekeepers do not inspect all frames when carrying out a disease inspection. Some only inspect one frame and many only three brood frames. The effect of an incomplete inspection depends on when the inspection is carried out and the disease status of the hives belonging to the beekeeper. If the inspection is carried out at a time when missing an AFB hive is unlikely to result in the disease spreading i.e. when there will be another inspection before any equipment is removed from a hive, then an incomplete inspection will have few consequences. Likewise, if a beekeeping outfit has no AFB then an incomplete inspection, even at a time when equipment is being exchanged between hives, will have few consequences. However, many beekeepers that report diseased hives each year remove frames from, and swap them between, colonies with incomplete brood checks. This is the main reason they have a continuing disease problem. Usually the reason full frame inspections are not conducted is because of the increased time required. This is however probably false economy as it is cheaper doing full frame inspections than having to burn hives due to an AFB outbreak. The change to full frame brood inspections can be painful at the start as more AFB hives are often found. However, there are many examples where beekeepers have made significant improvements in their disease status by changing to full frame inspections.

To carry out a full frame inspection, each frame containing brood needs to be removed from the hive and the bees shaken off. The comb then needs to be inspected for chewed/sunken cappings and larvae or pupae with disease symptoms. Isolated and healthy looking cells also need to be inspected as some colonies may have significant numbers of diseased larvae but no outward symptoms of AFB. I have seen several hives

with brood infection rates exceeding 80%, where no diseased larvae or sunken cappings were evident but the apparently healthy cells contained diseased pupae. However, spotty brood patterns were present and the colonies were starting to become weak. For this reason it is important to always uncap some cells in healthy frames.

If less than full inspections are being carried out it is important to check frames in both brood supers. I saw one hive where the brood in the top super had no obvious AFB symptoms. However, the bees had deserted the bottom super that had an 80% brood infection.

Inspecting dead colonies for AFB is much more difficult than live colonies, especially if the colony has been dead for some time. Although a skilled observer should be able to detect AFB scale (the dried remains of diseased larvae) the condition of the comb often makes this difficult. Many beekeepers also lack the necessary experience, as they do not often come across scale. Dead colonies that have died of things other than AFB but were infected with AFB are often not diagnosed correctly. The consequences of failing to confirm that AFB was the cause of colony death are much more serious if the supers, floorboards and lids are stored in a shed and the equipment split between a numbers of colonies the following spring. There have been some disastrous incidences where the empty frames themselves have been split between a large number of colonies resulting in a major disease outbreak. The best option for beekeepers with AFB problems is to be extra diligent and make sure colonies do not die. Where colonies have died and the cause has not been confirmed as AFB, the best action is to place a strap around the hive without removing equipment even if they still have honey supers in place. The hive can then be stored until it is restocked. If the new colony develops AFB, it and the equipment can be destroyed. Only the colony itself is lost as the equipment would have had to be destroyed in any case. Loosing a single colony is preferable to what would have happened if the equipment from a dead colony was split between a number of other colonies.

Dead hives should be strapped and restocked as a whole rather than spreading the equipment between hives
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The timing of inspections is also very important. Inspections should be timed to occur before hive management activities are carried out that may spread the disease.

AFB problems can also occur where inspections are carried out by a number of different people. Staff need to be well trained and supervised, an issue that that will be covered in a later article. To keep everyone motivated to perform adequate AFB checks, a good approach is to issue everybody doing inspections with a felt pen and get them to write their initials and the date on the lid of each hive they inspect.

