

Diagnosing American Foulbrood Disease

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Diagnosing American foulbrood disease (AFB) in honey bee colonies correctly, can be difficult. The first step, once the bees have been shaken off a frame, is to check the cell cappings for those that are darker than the surrounding cells, sunken or have irregular shaped holes chewed in them. Some experience is required to be able to tell the difference between the holes left in cappings as they are being sealed (Figure 1), holes caused by emerging bees, and those chewed by bees trying to remove a diseased larva (Figure 2). Any suspect cell should be uncapped.

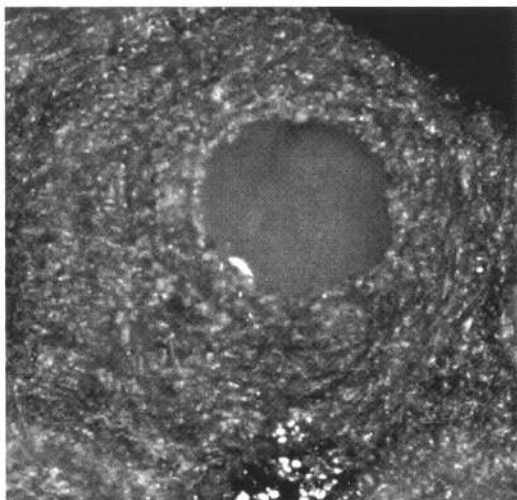


Figure 1. A cell in the process of being sealed.

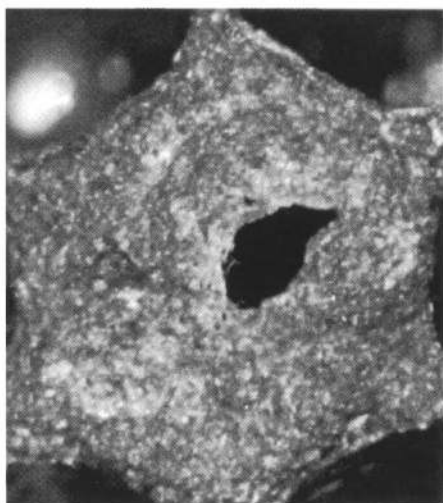


Figure 2. Hole chewed in the capping of a cell where the bees are trying to remove a diseased larva.

Cells with irregular holes chewed in the cappings will, hopefully, not conceal an AFB diseased larva or pupa. Bees chew the cappings on cells containing larvae with chalk brood disease (caused by a fungus), sacbrood disease (caused by a virus infection) and parasitic mite syndrome (caused by varroa). It is important, therefore to be able to recognize these diseases as well so they can be differentiated from AFB. Every registered beekeeper in New Zealand should have received a

pamphlet with colour photos describing the symptoms of all four diseases.

Unfortunately, just because one or most of the cells in a hive with chewed cappings contain larvae without AFB this does not mean that there is not one or more containing AFB infected larvae. Most beekeepers faced with a large number of cells with chewed cappings only uncap a few and if the cells do not contain AFB assume that the rest do not contain AFB larvae. The only way to be confident that there is not an AFB diseased larva lurking behind a chewed capping is to remove all chewed cappings. In some cases this may mean uncapping a large number of cells.

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Parasitic mite syndrome (PMS), that occurs with high varroa numbers, makes this even more difficult. PMS may result in more than 50% of cell cappings being chewed or sunken. It would usually be too difficult in these cases to check every cell with a chewed capping. However, beekeepers have found out the cost of not doing so the hard way. Their hives were inspected as the honey was removed and correctly diagnosed as having PMS by the beekeeper checking a few cells. The honey was removed, the hives treated for varroa, the honey extracted and the wet supers stored with the other supers. When the control strips were removed 6 weeks later the PMS had disappeared. It then became obvious that some of the chewed cappings had concealed larvae with AFB and that there was going to be more diseased colonies when the wet supers were used next.

The obvious answer to the PMS problem is to not let varroa numbers get high enough to cause PMS. If PMS is present, treat the colonies without removing the honey and only remove it after the PMS has cleared up and the hives have been checked properly. Alternatively, the honey could be removed and the PMS hives treated. Each PMS hive should be numbered along with the honey supers removed. These should not be extracted until after the PMS has disappeared and the colonies have been rechecked. Alternatively the honey could be extracted and the frames returned to their original supers. These could then be located and destroyed if the hive they came from was found to have AFB.

AFB diseased larvae or pupae may take on a range of appearances as the disease symptoms develop. A larva is initially pearly white curled around the bottom of the cell. As the disease takes hold the larva stretches itself along the lower wall of the cell (PMS larvae normally spiral up the cell). The normally plump larva then slumps in on itself as the bacteria consumes its tissues (both chalkbrood and sacbrood diseased