

### Identifying Brood Diseases

Shake all of the bees off a frame before checking it for disease. The cell cappings should then be examined to identify any that look unusual. These may be darkened, sunken or have irregular holes.



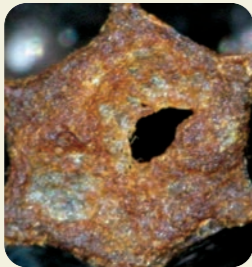
Normal cell being sealed



Normal cell capping



Dark, sunken cell capping



Irregular hole in capping



Frame with a spotty brood pattern

Also check normal looking cells on frames with a spotty brood pattern, as bees from these cells may not have emerged for some reason. Suspect cells should be uncapped and the contents examined. The contents of unsealed cells should also be checked.

### Recognising Healthy Brood

In order to identify bee diseases it is important to be familiar with the appearance of healthy brood:



3 day old larva



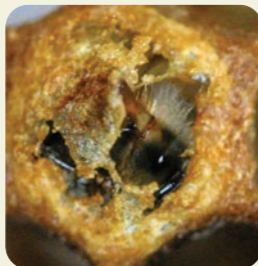
Prepupa



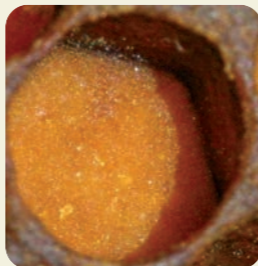
Pupa



Pupa



Emerging bee



Pollen

Larvae die from a range of causes other than diseases. There may also be more than one disease present in a colony at one time. If the symptoms are difficult to identify, look for other larvae on the frame with similar symptoms that may be easier to identify.

### Treatment

#### Parasitic Mite Syndrome (PMS)

PMS occurs in colonies with high varroa levels. It will often disappear once varroa has been controlled. However, its presence in a hive may mean that the colony has been damaged to such an extent that the colony will die even if the mites are controlled.

#### American Foulbrood Disease (AFB)

Colonies with AFB must be burnt. This includes the bees, brood frames, hive parts and any honey. Details of how to carry this out can be found in: *Elimination of American Foul brood without the use of drugs* by Dr Mark Goodwin. The finding of an AFB hive must be reported to the Management Agency of the AFB Pest Management Plan within 7 days.

#### Sacbrood

Sacbrood will often disappear from a hive by itself. It can often be cleared up by requeening.

#### Chalkbrood

Like sacbrood, chalkbrood will often disappear from a hive by itself. Small colonies can suffer badly with chalkbrood. Like sacbrood, the symptoms often disappear if the colony is requeened.

### Other Diseases

#### Half-Moon Syndrome

This appears to be queen related but has larval symptoms similar to PMS. There is usually drone brood in worker cells, multiple eggs in cells and eggs stuck to the walls of cells. The symptoms will usually disappear if the colony is requeened.

#### European Foulbrood (EFB)

EFB is a bacterial disease of larvae. The larval symptoms are similar to PMS and half-moon syndrome. EFB has not been found in New Zealand. If PMS or half-moon symptoms are present, but varroa numbers are low and there are no multiple eggs in cells or drone brood in worker cells, it may be EFB and should be reported to MPI immediately on **0800 809 966**.



### Diagnosis of Common Honey Bee Brood Diseases and Parasitic Mite Syndrome

American foulbrood (AFB) is the most serious honey bee brood disease present in New Zealand. Its control and eventual eradication from New Zealand depends on beekeepers being able to identify it correctly.

Diagnosis of brood diseases can be difficult as high varroa infestations often produce larval symptoms (Parasitic Mite Syndrome) that appear similar to AFB symptoms.

The aim of this pamphlet is to assist with the diagnosis of honey bee diseases. If you are unsure whether a suspect larva has AFB please contact AsureQuality Ltd (**0508 00 11 22**). As AFB is a notifiable disease the Management Agency of the AFB Pest Management Plan must be contacted if a colony with AFB is found.

This pamphlet presents the symptoms of Parasitic Mite Syndrome and AFB, as well as sacbrood and chalkbrood that PMS can also be confused with. If your colony is affected and you cannot diagnose the cause it is important to seek advice. Contact the MPI pest-and-disease hotline **0800 809 966**.



### Parasitic Mite Syndrome (PMS)

**PMS describes the brood symptoms that occur with high varroa levels. Only larvae are usually affected:**

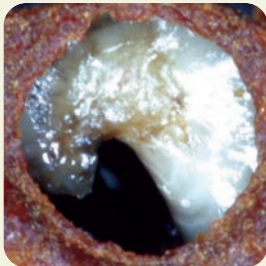
- Chewed/sunken cappings, similar to AFB.
- Larvae can slump along the lower wall and often have varroa feeding on them.
- Larvae can also spiral up the cell wall or coil in a c-shape at the opening.
- Larvae are white or yellow but not coffee (with milk) coloured.
- Larvae dry to a scale.



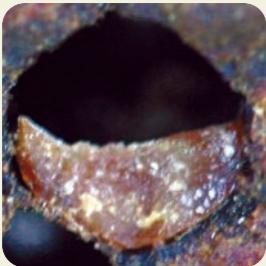
PMS larva with varroa



PMS larva spiralling up cell

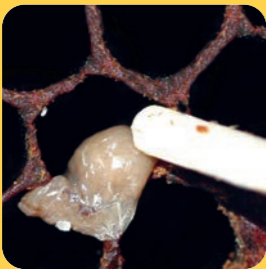


Yellow, c-shaped larva



Dried larva scale

The best way to differentiate PMS from AFB is the white/yellow colour of the larva. Unlike AFB the larva can easily be removed from the cell with a matchstick and will not "rope out".



Removing PMS larva

### American Foulbrood Disease (AFB)

**AFB is a bacterial disease of honey bee brood:**

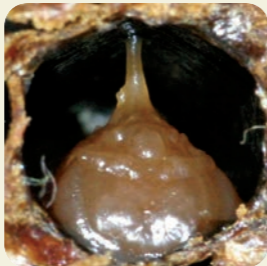
- The first signs of AFB are usually chewed cell cappings, sometimes sunken and darkened.
- When the cell is uncapped, coffee (with milk) coloured larva/pupa can be seen slumped on the lower wall.
- Bees will sometimes uncap infected cells.
- Pupae may have their tongues stretched across the cell.
- Older larvae/pupae dry out and turn into black scales that are difficult to remove from the cell wall.



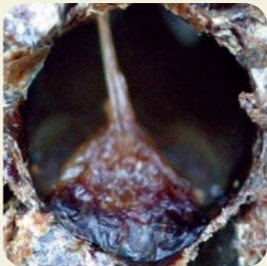
Very early infection



Diseased larva



Diseased pupa with tongue



Older, darker diseased pupa

To diagnose AFB, mix up the larva/pupa with a matchstick and withdraw it from the cell. If the material ropes out then it is AFB. The presence of the pupal tongue stretched across a cell also means it is AFB. Dry scales do not "rope out".

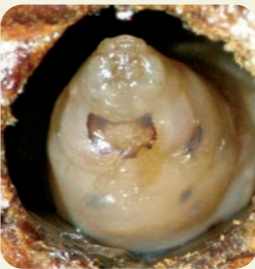


AFB "Ropiness" test

### Sacbrood Virus

**Sacbrood virus affects larvae:**

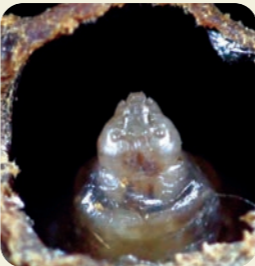
- The cells may have chewed cappings like AFB.
- The larva (usually 4 days old) lies along the lower wall of the cell. Unlike AFB or PMS it does not slump against the wall but remains rigid, initially swells and the larval head always sticks up.
- Larva may be white, black, white with a black head, or coffee coloured (like AFB) but with a black head.



Swollen larva



Coffee coloured larva



Advanced symptoms



Advanced symptoms

Removal of a sacbrood larva with tweezers reveals a fluid filled sack. If the fresh larval remains are stirred with a matchstick they are watery and do not "rope out".



Sacbrood larva removed

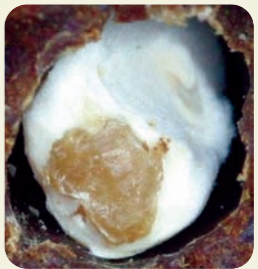
### Chalkbrood

**Chalkbrood is caused by a fungus affecting late stage larvae:**

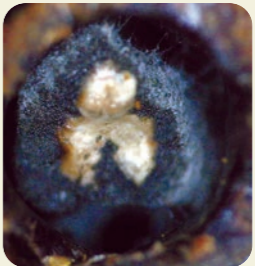
- Cell cappings may be chewed like AFB.
- Early larval symptoms are similar to sacbrood with swollen white larvae lying along the lower wall of the cell.
- The larvae then turn into white or black mummies that fill the whole cell. The white larvae often have a yellow head that may protrude across the cell.



Early chalkbrood



Mummy with yellow head



Black mummy



White mummy

The mummies can easily be removed and can even be shaken from a frame. In bad cases mummies can be seen on the floorboard or in front of the hive.



Chalkbrood mummies removed