

## American Foul Brood (AFB)

This is a disease of sealed brood. AFB is a Notifiable Disease and if suspected MUST be reported to the Agriculture Department as soon as possible.

### Cause

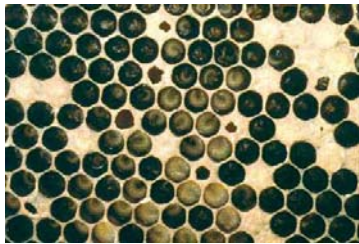
AFB is caused by a spore forming bacterium *Paenibacillus larvae*. It is this ability of the bacillus to spore that makes the disease so resistant to disinfection.

### The Disease

Infection of the larva is by ingestion of the spores in contaminated brood food. Germination of the spores in the adult bee is prevented by the bactericidal effect of 10-hydroxydecanoic acid (10-HDA) from the worker bees mandibular glands. Once in the larval gut however the conditions are ideal for germination and the bacterial population doubles about every 8 hours. When the larva has voids its gut contents prior to metamorphosis sporulation begins and the cell contents become a source of further infection. The bacteria continue to multiply in the haemolymph and this leads to the death of the larva. Once larval death has occurred the bacteria again sporulate within the body.

### Signs in the colony

The infected larvae die within the sealed cell and the appearance of the cell changes. The cappings become sunken. They may be perforated if the adult bees nibble holes in them. These holes tend to be ragged. The cells may be moist, greasy or very dark. At this stage the dead larval remains are various shades of brown and have a sticky/slimy consistency. At this stage if a matchstick is inserted into the cell a mucus like 'rope' can be drawn out. This is 'The Ropiness test'



Perforated Cappings

The larvae then start to dry becoming a darker brown and finally end up as a very dark brown rough scale attached to the cell wall. This makes them difficult for the bees to remove and keeps the infection in the cell. Scales can be detected by holding the comb so that they are facing the light which gets reflected from their rough surface.

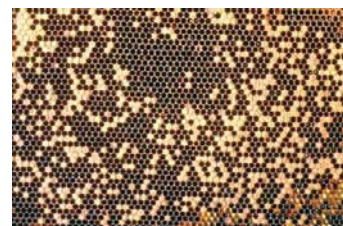


Scales

In the early stages only a few cells will be affected but eventually it will spread throughout causing a 'pepperpot' brood pattern.



Rope Test



Pepperpot Brood pattern

**Diagnosis** can be done visually, particularly at the rope stage, but if there is any doubt the remains can be examined bacteriologically at the laboratory.

**Spread** of the disease is usually done by the beekeeper. Contaminated comb, honey and hive equipment can transfer the spores. This can transfer the infection between sites.

As the colony becomes weakened robbing by neighbouring colonies will further spread the disease. Drifting can likewise spread the disease to other colonies. Swarms can carry the disease which starts again once they start to raise brood.

**Control** is by regular examination of the brood comb and the destruction by fire of any infected colony. There is no treatment option for AFB.

The bees frames and combs are burnt in a deep pit. Hive bodies and appliances can be sterilised by scorching them with a blowlamp but if there is any doubt about the quality of the sterilisation it may be better to burn the lot. Hive tools and smokers can be washed in hot water containing washing soda and bleaching powder. Personal clothing should be washed in hot soapy water.

### **Rules for Foul Brood Control**

1. Know the signs and causes of the disease
2. Inspect carefully in Spring and Autumn
3. Never transfer combs between colonies before checking for disease
4. Never bring colonies or combs into the apiary unless from a known clean source
5. Never buy old combs and scorch second hand hives before use.
6. Control robbing and never feed honey from another source.
7. If a colony dies seal the hive and test for disease.
8. If a colony is not thriving examine for disease.
9. Never trust swarms. Hive them on foundation and check for disease.
10. Regularly replace old brood comb with foundation.

Finally - learn to recognise healthy brood and disease brood will be much more obvious.