Fact sheet

Plant Health AUSTRALIA

ESTABLISHED PEST

European foulbrood

What is European foulbrood?

European foulbrood (EFB) is a brood disease caused by the bacterium *Melissococcus plutonius*. Larvae of all ages are susceptible to infection and become infected after ingesting contaminated food. The bacterium then multiples in the gut of the larvae and competes for food, resulting in the larvae dying of starvation. The incidence of EFB is generally higher when the colony is under stress such as in spring, when the weather can be cool and wet or when nutrition is poor.

What should beekeepers look for?

Brood combs should be thoroughly examined for EFB in spring and in autumn. Beekeepers should remove each brood frame from the hive and look for symptoms such as an irregular brood pattern with a mottled appearance. Infected larvae die in a coiled or twisted position, and change from the healthy pearly white to yellow and then to brown. Beekeepers should specifically look at unsealed brood because most infected larvae usually die before their cells are capped.

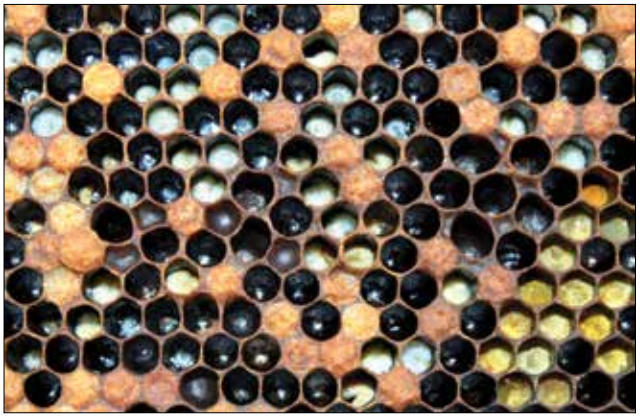
At this stage of infection beekeepers should conduct the ropiness test on older dead brood. Thrust a matchstick into the infected individual, and if the semi-fluid remains are drawn out in a ropy thread it indicates the hive could be infected with EFB. In older dead brood, a strong ammonia-like smell may also be present.

What can it be confused with?

EFB can be confused with American foulbrood (AFB). The majority of EFB infected larvae die before capping and appear coiled in their cells, which is in contrast to AFB where the majority of infected larvae die after capping. However, when EFB infected brood die at older stages they can be confused with AFB.

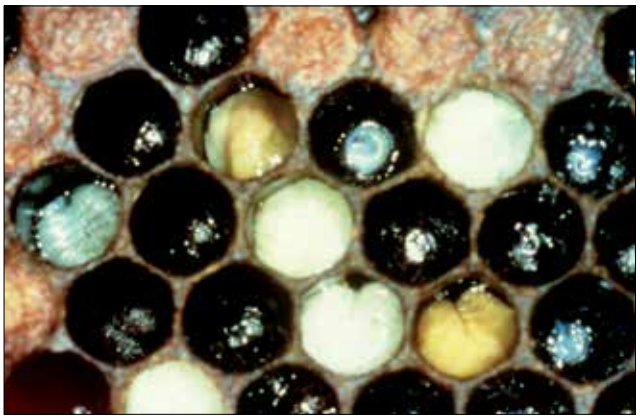
Food and Environment Research Agency (Fera), Crown Copyright

Spotted brood pattern is an indicator of EFB



Rob Snyder, www.beeinformed.org

Central cells are infected with EFB and are curled upwards and off coloured



Doug Somerville, NSW DPI

Infection of EFB in its early stages showing infected larvae turning yellow

Another potential difference between AFB and EFB is that when the ropiness test is conducted by placing a matchstick into the affected brood, AFB infected brood is usually drawn out in a longer ropy thread than EFB infected brood. However, when *Paenibacillus alvei* (a common secondary invader in EFB) is present it may also cause some extra ropiness which makes it resemble AFB infected brood. Laboratory diagnosis is the only accurate means to differentiate EFB from AFB.

How does it spread?

EFB can be spread within an apiary and between apiaries by the interchange of infected combs and hive components, feeding hives infected honey or pollen, honey bees robbing honey from infected hives or from extraction sites, as well as by honey bees drifting from infected colonies into neighbouring colonies. EFB is highly infectious and can remain viable for several years.

Where is it now?

EFB is present in all states and territories in Australia, except for WA and NT.

How can beekepers protect their hives from European foulbrood?

Beekeepers should always try to keep strong colonies with a young and healthy queen bee, as well as replacing brood combs every 3-4 years as these can act as a reservoir for the bacterium. Brood combs should be thoroughly checked for early signs of EFB in Spring and Autumn. To greatly minimise the spread of undetectable levels of EFB throughout loads of hives, put in place a barrier management system and disinfect hive tools and apiary equipment between hives and apiaries.

Rob Snyder, www.beeinformed.org

Healthy larvae are pearly white, while EFB infected larvae are a darker, yellowish colour and are in a coiled and twisted position

Rob Snyder, www.beeinformed.org

After two to four weeks, infected larvae may dry up to form a scale at the bottom of the brood cell

For more information about EFB, go to **www.beeaware.org.au/european-foulbrood**. The BeeAware website contains extensive information on EFB, including:

- Disease cycle
- Symptoms
- Detection methods
- Spread and distribution
- Similar pests
- Management options
- Additional fact sheets and videos