



European foulbrood

European foulbrood, (EFB) is a problem for beekeepers throughout the world, with the United Kingdom in particular struggling to contain it (EFB is the widest-spread bacterial brood disease in the UK). Although it has yet to spread as far as New Zealand, it is found throughout eastern Australia. It is likely that without strong preventative measures it will continue to spread to the few remaining areas in the world that are as yet unaffected.

How it affects the hive

Caused by the bacterium *Melissococcus pluton*, EFB affects larvae and can cause a significant reduction in the capacity of the hive and if unchecked can lead to the entire colony dying.

The larvae first become infected when they take in food which has been contaminated by the *Melissococcus pluton* bacterium.

They can also be infected by:

- robbing - a colony with EFB is susceptible to robbing because it will be weakened, increasing the chances that the infection will be spread to other hives
- beekeeping equipment that has been contaminated with EFB and not properly cleaned
- transferring combs from infected hives to a previously uninfected hive.

Once the bacterium is inside the larvae it grows within their gut, consuming most of the food they take in. This normally results in starvation and the death of the larvae. If the larvae survives the disease and pupates, it will then leave more of the bacteria through its faeces, which can spread the infection further within the hive. If instead the larvae dies, it dries to a dark scale which also causes the infection to spread.

Hives are considerably more susceptible when under stress:

- from moving
- bad weather
- poor nutrition.

An infection can remain in the hive even with no visible signs, only to break out again if the hive comes under stress from external factors.



Healthy larvae are white coloured, unhealthy/dead larvae are a darker, yellowish colour. PHOTO: Rob Snyder

Symptoms and Detection

Because worker bees often remove diseased larvae, EFB can be hard to detect. Most larvae will die before capping but some will die after — which can lead to a misdiagnosis of American foulbrood.

Beekeepers should look out for the following signs of infection in their hives:

- Diseased larvae change colour from white to a yellowish brown
- Dead larvae may be watery in consistency
- There may be a sour odour present
- The brood pattern will become uneven, with capped and uncapped cells mixed together.

Since EFB is most likely to occur in spring or autumn, beekeepers should examine their hives for EFB a minimum of two times a year, during those seasons.

Remove each frame, remove the bees and carefully inspect it for any of the symptoms listed above.

Prevention

The best way to protect your hives is to stop them getting infected in the first place. While it is almost impossible to fully protect a hive these steps should significantly reduce the risk:

- Maintain the highest possible levels of hive hygiene by keeping all beekeeping equipment clean. Try not to introduce unknown bees or equipment to the hive to reduce the risk of infection spreading
- The hive with a young queen regularly — a younger, healthier queen will be better for the hive. Breed from bees that already proven to be resistant from disease if possible.
- Take every precaution when moving bees to minimise stress. Stress is a key risk factor for EFB.
- Ensure bees have access to good supplies of pollen and nectar and using artificial feeding methods when necessary, as this too will help keep stress at a minimum.

Treatment and Control

EFB can be treated with antibiotics, however extensive antibiotic use could possibly lead to the proliferations of antibiotic-resistant strains of the bacteria. For this reason, the destruction of affected colonies is a better way of curbing the spread of the disease.

If you have multiple colonies and more than 10 per cent of them show signs of the disease, every colony should be treated.

SOURCES

http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0005/117356/european-foulbrood-control.pdf
<http://beeaware.org.au/archive-pest/european-foulbrood/#ad-image-0>
<https://www.daf.qld.gov.au/animal-industries/bees/diseases-and-pests/european-foulbrood>
<https://www.agric.wa.gov.au/bees/european-foulbrood-bees?page=0%2C2>
<http://www.extension.org/pages/23693/european-foulbrood-a-bacterial-diseaseaffecting-honey-bee-brood#VZjgsUZEU6U>

BANNER PHOTOS ON PAGE 1 (CLOCKWISE FROM LEFT)

Close up of European foulbrood contaminated brood food.
PHOTO: Rob Snyder, www.beeinformed.org

Affected larvae will stretch or 'rope' when a stick is inserted and gently pulled.
PHOTO: Georgia Department of Agriculture Archive, Bugwood.org

European foulbrood infected larva showing the yellow/white infected larval gut.
PHOTO: Food and Environment Research Agency (Fera), Crown Copyright