Agnote

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# European Foul Brood Disease of Honeybees

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## THE DISEASE

The European foul brood disease (EFBD) or European brood disease is a serious disease of larvae of honeybees. Its occurrence in Queensland dates back to 1950 with the most recent outbreak at Yelarbon in late 1980. It was first isolated in the south-east of South Australia in 1977 and is now widespread throughout bee-keeping areas of that State. It is of greatest concern in South Australia, Victoria and New South Wales.

EFBD has not been found in the Northern Territory but it is a notifiable disease under the *NT Livestock Diseases Act 2008* and any suspected case must be reported to the Senior Field Veterinary Officer of your local primary industry department.

The importation into the Northern Territory of bees, used hives and equipment, raw honey, pollen or other apiary material must be accompanied by an interstate health certificate confirming freedom from EFBD. This is necessary for the protection of the Northern Territory industry.

## CAUSAL ORGANISM

EFBD is caused by the bacterium *Melissococcus pluton*. Secondary organisms may occur in association with *M. pluton*, e.g. the bacterium *Bacillus alvei* is common. Cells of *M. pluton* can remain viable for up to three years. Larvae may die at any stage, but normally death occurs at the four to five day stage.

## SYMPTOMS

1. In the early stages, combs may appear quite normal. However, closer examination may show some larvae displaced from their normal curled position. Infected larvae have a gut-line, which is chalky white/bleached rather than medium yellow/orange. The white or bleached appearance results from pockets of the bacterium in the gut of the larva.

2. Larvae may die in the normal "C" shape, but are often twisted or lying in unnatural positions.

3. The colour of infected/dead larvae changes from grey to yellow to orange to brown. In the yellow stage, larvae have a glazed appearance.

4. Dead larvae do not show the typical ropiness of larvae suffering from American brood disease, although some ropiness can be present.

5. An offensive odour is not necessarily present. This differs from the odour associated with American brood disease.

6. Larvae dry out to form a scale loosely attached to the cell's inner wall. This may be easily removed, unlike the scale formed by the dried-out larvae in a hive affected by the American brood disease.

7. Later larvae and prepupae may be dead in sealed cells, the cappings of which can be perforated.

## DIAGNOSIS

EFBD is generally more prevalent during the warmer months (September - March) in southern States. However, it can cause losses to bee larvae and honey production at any time during brood rearing.

Hives should be inspected at least twice a year for EFBD. If you suspect the disease contact the Senior Field Veterinary Officer for a hive inspection or bring a suspect brood frame to the regional primary industry office.

## TRANSMISSION

The disease-causing organisms are spread by infected bees, or by infected material being introduced by the beekeeper during tending of the hives.

Once in the hive, the disease can be spread by worker bees during housekeeping.

## TREATMENT

a. Seal up the entrance holes of the hive after the bees have ceased foraging.

b. Do not remove bees, bee products, or equipment from the area.

c. Heavily infested colonies (say 20% of larvae are infected) should be destroyed by burning the combs in a hole about 2 m square x 500 mm deep. New combs placed in the brood chamber should be treated with the antibiotic oxytetracycline (Terramycin®).
   For double stories or strong single hives, use 1 g of Terramycin® in 500 mL of 1:1 sugar solution. For weak single storey hives or nuclei, use 0.5 g of Terramycin® in 250 mL of 1:1 sugar solution.
   It is applied by removing the honey super and lifting the queen excluder, tilting the hive back so the solution does not run out of the front of the hive. Apply the solution with a dipper (250 mL or 500 mL capacity) evenly over the tops of the brood combs.

d. In moderate to light infestations, all colonies at one site should be treated with an antibiotic as soon as possible.

e. A withholding period of at least three months should be observed before further extraction. The maximum residue level is still being developed.

Surplus honey should be removed from the hives and supers covered to prevent robbing. The honey should be extracted. Handling and extracting equipment should be thoroughly washed. Old dark combs should be treated with steam. Good light combs should be fumigated with glacial acetic acid. This will control EFBD and Nosema disease.

Fumigation with glacial acetic acid is done by:

i. stacking up to four full depth boxes of combs on bottom boards or pallets and sealing cracks with masking tape;

ii. placing a wad of absorbent material (e.g. bag, cloth, or foam) inside an empty super (make sure the wad does not touch the sides of the super);

iii. pouring 600 mL of glacial acetic acid over the wad, sealing off the stack, and leaving for five days; and

iv. airing for two days before use.

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