

Chalkbrood Disease of Honeybees

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THE DISEASE

The fungus *Ascosphaera apis* causes chalkbrood disease in honeybees. It affects worker, queen and drone brood. It does not infect humans and it has no effect on the quality of honey and other apiary products.

Chalkbrood disease was detected in Queensland in January 1993 and has since spread Australia wide. It is no longer a notifiable disease under the *NT Livestock Act 2008*; however, you should report it to your local primary industry department.

The importation of bees, used hives and equipment, raw honey, pollen and other apiary material must be accompanied by an interstate health certificate stating visible freedom from chalkbrood disease. This is necessary for the protection of your hives and the industry.

Minimal effect can be expected to production if apiaries are managed well and the hives are kept under good field conditions. Stress factors include poor nutrition, high humidity, lack of ventilation, watery food (above 19% water content), disease, and genetic predisposition.

INDUSTRY SIGNIFICANCE

- Reduced population of the bee colonies with lower honey production.
- Up to 80% of a brood can be killed by chalkbrood disease, resulting in infected hives dying out.
- Weakened colonies will not serve as efficient pollinators.
- There will be necessary imposition of movement controls between States for apiary products, bees (including queens), apiaries, used hives and beekeeping equipment.

LIFE CYCLE

Honeybee larvae swallow spores of the fungus with their food. Infection occurs when the spores germinate in the gut of a larva and produce fungal growth (mycelia). The growth invades the body tissue causing the death of the larva and the development of more spores. The dead larva dries into a hard, shrunken, white chalk-like lump.

SYMPTOMS OF CHALKBROOD DISEASE

Position

In the early stages the dead larvae are stretched out full length in their cells.

Age of Larvae

Larvae die after the brood cell has been capped. Bees will often remove the cell caps to investigate or remove the dead brood.

Colour

The dead brood is mostly white, but may be mottled, or blue-grey or black. Some white mummies (dead brood) when removed from the cell may be covered in small black dots (spore cysts) at the hind end. Symptoms can be confused with white pollen or mouldy pollen.

Consistency

Dead brood can be coated with a fluffy down covering that is soft. The dead brood dries out and does not adhere to the cell wall. It is brittle and chalky, giving the impression of a small piece of white or stained chalk.

Shape

Infected larvae may at first appear swollen, taking on the hexagonal shape of the cell. Later, they shrink and dry out after detaching themselves from the cell walls. The dead brood can be shaken from open cells.

Cappings

Cell cappings are not discoloured or sunken as happens with other brood diseases. Bees will often remove the cappings to investigate the dead brood. In severe infections, the dead brood in the sealed cells will rattle if the comb is shaken.

Hive entrances and bottom boards

Dead brood (mummies) dislodged by worker bees may be seen on the bottom of the hive boards or on the ground outside the hive entrance. These are more evident when infections are severe.

Odour

A slight non-objectionable odour may be present.

TRANSMISSION

The spores (which may be likened to the seeds of a plant) can be transmitted by bees, including queens and escorts, queens' cells, apiary products including honey, pollen, propolis, comb honey, used beehive components including combs and used beekeeping tools and appliances. Spread between colonies can occur through drifting and from robbing and foraging bees on contaminated flowers.

Spores can be carried on gloves, clothing and footwear. These should be changed or washed with soapy water and disinfectant before going to other apiaries. Smokers and hive tools should also be thoroughly cleaned.

PERSISTENCE OF THE FUNGUS

Spores may remain infective for more than 15 years. Viable spores may remain in stored honey, pollen, pollen capsules/tablets, used hive components, used beekeeping tools and equipment and possibly in soil around infected apiaries.

DIAGNOSIS OF THE DISEASE

If you suspect chalkbrood disease, contact your Senior Field Veterinary Officer for a hive inspection or bring a suspect brood frame to your regional primary industry department office. Samples will be taken for laboratory diagnosis.

To inspect the brood, shake all the bees from brood combs and hold the frame so you can look directly into the cells. Inspection should occur in periods of good daylight for easy viewing of the symptoms. Do not continue the inspection if robber bees are active.

TREATMENT

There is no treatment for this disease. Badly affected frames should be destroyed. Hive management should aim to remove stress factors.

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