

Pests and diseases of honey bees



a field diagnosis guide for Western Australian beekeepers

The major threats

Bee brood diseases, exotic mites (exotic meaning not known to exist in Australia) and the parasite *Braula coeca* are some of the main threats to the commercial apiary industry in Western Australia. Prompt identification of these pests and diseases is therefore vital to limiting the economic impact on hives.

This brochure aims to provide apiarists with a handy guide enabling them to make a quick assessment for pest or disease presence.

As well as the symptoms of each pest or disease, this guide also advises the sample type required. These include larval smears, adult bees, comb sampling and pest samples.

Honey samples can also be tested for American Foulbrood disease (AFB) spores to indicate the level of infection within an apiary. Collect at least 200 grams of honey from bulk storage containers. Samples can be sent to Animal Health Laboratories DAFWA South Perth.

The suspected presence of any of the exotic pests should be reported to:

Exotic Disease Hotline – 1800 675 888
Pests and Diseases Information Service 1800 084 881.

WA Beekeeper registration

The Western Australian Beekeepers Act (1963) was introduced to make better provision for the eradication of diseases and pests of honey bees, the orderly conduct of the industry and for the improvement of the products from beekeeping.

Under the Act, all persons keeping honey bees are required to register with the Department of Agriculture and Food and to brand their beehives with a registered hive brand as allotted by the Register of Brands. All beehives must be registered for the following year by 1 January. Registration information assists the bee industry to control bee diseases and prevent residues in hive products. Specifically it enables:

- Rapid contact with beekeepers if an exotic disease or bee pest is detected in the State
- Provision of export certification for live honey bees and other hive products
- The implementation of disease control strategies

To register logon to www.agric.wa.gov/PC_91802 or phone 9780 6100.



NSW DEPARTMENT OF
PRIMARY INDUSTRIES



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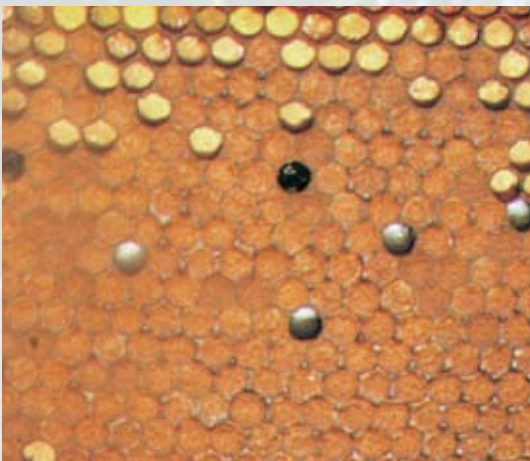
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Healthy brood larvae



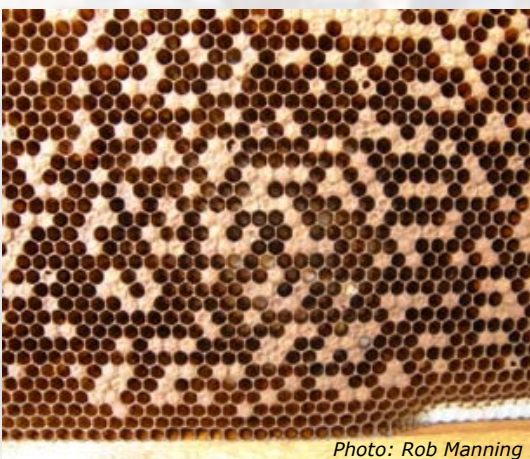
Healthy larvae are pearly white, glistening and positioned in the centre of the cell.

Sealed stage



In a healthy brood the caps on the brood are convex (they bulge out)

The 'peppered' appearance of a diseased brood typical of American and European Foulbrood



Notes: Be careful when checking the age of affected larvae. Bees can uncap diseased sealed brood, giving the impression that only the unsealed brood is affected.

European Foulbrood (Eastern states only)



The larvae turn yellowish and assume unnatural positions in the cell. The four large white larvae are healthy. One smaller larva is showing early signs of discoloration. Empty cells are characteristic of this disease.

Age of brood affected Commonly brood of 3–5 days. Occasionally sealed brood.

Cell position of diseased brood Twisted, in a 'C' position. Occasionally stretched out on cell wall.

Colour of diseased brood Yellow-brown

Ropiness of moist material Sometimes ropes (like AFB) due to secondary infections but mostly with a lumpy or granular appearance.

Smell Strong sour smell.

Scale characteristics Loose scales.

What should be sent for diagnosis Comb sample containing, or larval smear slide made from, suspect brood.

American Foulbrood (Endemic)



The caps on the sealed brood maybe concave and/or perforated. In a number of the cells, black scales can be seen on the side wall of the cell.

Age of brood affected Brood of 7–10 days from late larval to pupal stages.

Cell position of diseased brood Bottom of cells along bottom 'V'.

Colour of diseased brood Brown-black.

Ropiness of moist material Ropy to smooth.

Smell Little smell.

Scale characteristics Scales stick to cell walls.

What should be sent for diagnosis Comb sample containing, or larval smear slide made from, suspect brood.

Chalkbrood (Endemic)



Dead brood can be covered with a fluffy downy coating. The dead brood dries out, shrinks, and becomes brittle and chalky.

Age of brood affected Both sealed and unsealed brood, larvae and pupae.

Cell position of diseased brood Early stages: fluffy and swollen to full dimensions of the cell.

Colour of diseased brood Generally white, but can be grey-black (covered in spores).

Ropiness of moist material Nil.

Scale characteristics Loose; mummies rattle when shaken.

What you should send for diagnosis

Mummies or comb containing suspect brood.

Tropilaelaps Mite (Exotic)



Reddish-brown Tropilaelaps mite (adults approximately 1 mm long) on developing pupa where they feed and lay eggs. Mites deform developing bees or kill them outright. They move very fast on comb and bees.

Age of brood affected Late larval or pupal stage; some brood develops into deformed adult bees.

Diseased brood Reddish-brown mites can be seen.

Ropiness of moist material Nil.

Characteristics Deformed bees.

What you should send for diagnosis Bee brood sample containing mites or 30 + adult bees in a sealed container.

Sacbrood (Endemic)



The diseased larvae bloats and forms a gondola/banana shape that is slightly darker towards the head.

Age of brood affected Sealed brood of 7–10 days and pupae.

Cell position of diseased brood On the bottom, or occasionally sides of cells; gondola/banana shaped.

Colour of diseased brood Yellow to grey-brown to black.

Ropiness of moist material Nil.

Scale characteristics Loose scales.

What you should send for diagnosis Comb sample containing suspect brood.

Braula Fly (Exotic except Tasmania)



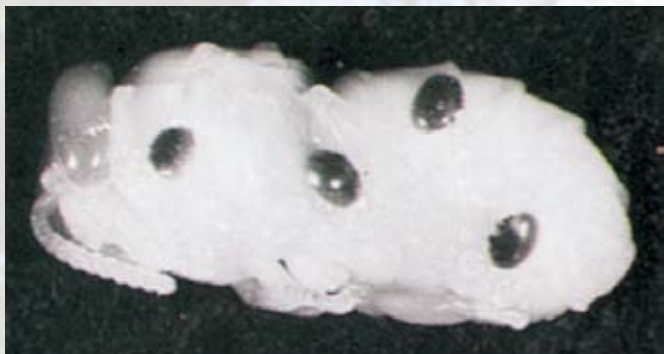
Braula coeca is a wingless fly 1–5 mm long that can be seen with the naked eye. They are red and have 6 legs. They tend to collect mostly on the queen bee.

The wingless flies attach themselves to the hairs of the honeybee's body. The female lays her eggs under the cappings of honey comb. The eggs hatch into larvae, then as the larvae feed, they form tunnels, damaging the honey comb. Larvae pupate, emerging as adults after 3 weeks.

Braula do little damage, although they may affect queen bee performance. They only occur in Tasmania. *Braula coeca* is also called 'Bee louse'.

What you should send for diagnosis Adult flies in a sealed container.

Varroa Mites (Exotic)



On pupae

Reddish-brown Varroa mites on a developed pupa where they feed and lay eggs. Mites deform developing bees or kill them outright. The Varroa mite adults are a scallop shell shape. The adult females are reddishbrown in colour and are 1.1 mm long and 1.7 mm broad. The adult male is smaller and yellowish-white in colour. They are visible to the eye.

Varroa is a major pest throughout much of the world, with Australia being the last major beekeeping country to be free of the pest.



Photo: Rob Manning

On bees

Varroa mites parasitising an adult bee. Adult workers and drone bees are the main method of transferring mites amongst

bees and hives. This occurs when the bees touch each other or drift to other hives.

Age of brood affected Brood just prior to sealing and after sealing.

Quick diagnosis use "sugar shake method" - one teaspoon of icing sugar in a bottle of bees - the sugar dislodges the mites from the bodies of the bees.

What you should send for diagnosis Bee brood sample containing mites or 30 + adult bees in a sealed container.

Parasitic Mite Syndrome (PMS)

PMS describes the brood symptoms that occur with high Varroa levels. Symptoms are similar to American Foulbrood with chewed/ sunken brood cappings in a peppered brood pattern. Larvae can be in varied positions within the cell and often have Varroa feeding on them. Unlike AFB, larvae are white or yellow in colour (not coffee), will not 'rope out', and dry scales can easily be removed from the cells.

Small Hive Beetle (Kimberley Region & Eastern States)



The Small Hive Beetle *Aethina tumida* (Murray) prefers warm to hot humid conditions. The adults are broad, flattened beetles about 5–7 mm long and dark brown to nearly black.

Larvae are elongate white grubs. Pupae

are white to brown and are found in soil beneath the hive. From egg to adult takes 38–81 days with five generations a year.

Adults and larvae inhabit hives where they feed on combs containing honey, pollen and brood. The adult beetles cause little damage to the hive, however the larvae kill brood and cause honey to ferment. This can result in bees abandoning their hives. Larvae are mainly active over the summer months. The Apithor harbourage is approved for use.

What you should send for diagnosis Mature larvae or adult beetles in a sealed container.

Other pests and diseases

These may include:

Disease	Sampling method
Nosema	30 + Adult bees (fresh)
Viral	30 + Adult bees (fresh)
Pests	Sampling method
Tracheal mite (exotic)	30 + Adult bees (fresh)
Wax moth	Adult moths or mature moth larvae
Any unknowns	Contact Senior Apiculturist 9368 3535

Wax moth are particularly a problem of stored equipment. Wax moth larvae are similar but can be recognised from small hive beetle larvae because wax moth larvae produce a silk webbing.

Laboratory contacts

Duty Pathologist Animal Health 9368 3351
A Submission Form is needed for all samples
Animal Health Laboratory
Specimen Reception
'C' Block DAFWA
3 Barron Hay Court
South Perth 6151

Fees and charges will apply for diagnosis of endemic pests and diseases that are listed in this brochure.

Further information

Contact Senior Apiculturist on 9368 3535.
Logon to <http://www.agric.wa.gov.au> and look under H for Honey bees.