

## Honey Bee Threats

Western Australia (WA) has used its geographic isolation and strict biosecurity entry requirements to maintain freedom from many honey bee pests and diseases. However, several endemic bee threats occur throughout WA, and some must be reported to the Department of Primary Industries and Regional Development (DPIRD). Beekeepers must also remain vigilant for new ('exotic') pests and diseases. Early detection and identification are critical for containing and eradicating threats and limiting economic impact on the bee industry.

This document aims to provide WA apiarists with a brief guide to major and common pests and diseases. Suspected cases of all exotic bee threats must be reported immediately to the **Exotic Plant Pest Hotline 1800 084 881**.

## Diagnostic Services

Diagnosis of honey bee pests and diseases can be performed by DPIRD's Apiary team (email **PBhoney@dpird.wa.gov.au** to request

assistance) and DPIRD's Diagnostic Laboratory Services (DDLS). Honey samples can be tested for American foulbrood spores to indicate the level of exposure within an apiary, before or after symptoms occur. Samples of at least 100 ml clean honey can be submitted to DDLS for testing. Search for 'DDLS Animal Pathology' at **agric.wa.gov.au** or call DDLS on **9368 3351** for information on their testing services and fees.

## WA Beekeeper Registration

All persons keeping honey bees are required to register with DPIRD and apply their brand to their hives. Registration assists the bee industry to control bee threats. Specifically, it enables:

- Quick identification of hive owners
- Rapid contact with beekeepers if an exotic disease or pest is detected in WA; and
- Biosecurity tracing and the implementation of pest and disease control strategies

To register, contact the Brands Office (Bunbury) by phone **1300 926 547** or email **Brands.Bunbury@dpird.wa.gov.au**.

To be able to identify symptoms of pests and disease, beekeepers must first become familiar with healthy larvae and pupae (collectively 'brood'). In the first part of their development, healthy honey bee larvae are pearly white, glistening, and positioned in the centre of the cell. As larvae develop into pupae, worker bees cap the cell with wax. Healthy, capped cells are convex (they bulge outwards) and usually occur in a uniform pattern. Any change in larvae colour, sunken caps, or spotty/ununiform brood patterns should be investigated for disease.

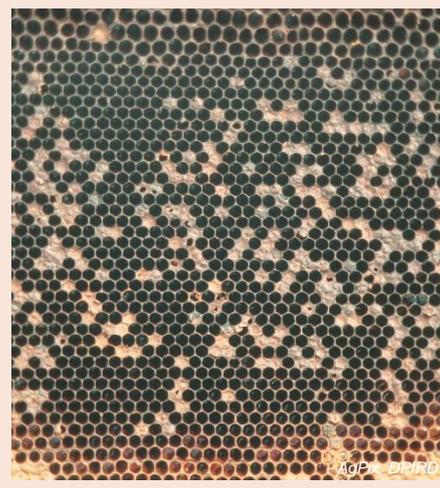
Healthy larvae



Healthy capped brood



Diseased brood



Bacteria



**American foulbrood (AFB) (*Paenibacillus larvae*)**

Major brood disease, fatal to colonies and expensive for beekeepers. Dead brood turn into a brown semi-solid with a foul odour. Initially, dead brood have a glue-like consistency producing a long, smooth rope when probed (pictured), but eventually dry to a hard scale. Capped cells are sunken, dark-coloured, greasy and/or perforated.



**European foulbrood (EFB) (*Melissococcus plutonius*)**

Moderate brood disease that can be eradicated with management; established in eastern states. Larvae die, turn yellow-brown and become contorted in a 'C' position, eventually drying to a loose scale. Sometimes ropes like AFB, but mostly with a lumpy or granular appearance. Odour of diseased larvae is foul and sour.

Exotic

Fungi/microsporidia



**Chalkbrood (*Ascosphaera apis*)**

Moderate brood disease, reduces hive population and productivity. Fungus affects sealed and unsealed brood. Dead brood can be covered with a fluffy downy mould before drying out to a shrunken, brittle, and chalky mummified-larvae. Mummies are usually white, but can be grey-black (covered in spores), and are loose in comb.



**Nosema (*Nosema apis*)**

Moderate microsporidian disease that affects honey bee digestive systems, reducing worker lifespan and weakening the colony. Most apparent when nutrition is poor and weather is cold and wet, i.e. autumn to early spring. Common symptom is dysentery: brown diarrhoea on frames (pictured) and the outside of the hive.

Viruses



**Black queen cell virus (BQCV)**

One of the most common and abundant bee viruses worldwide, occurring chronically and mostly asymptotically. BQCV primarily occurs in developing queens, but may affect workers and drones. BQCV causes brood to die, turning yellow, then black-brown in a sac-like formation.



**Deformed wing virus (DWV)**

Though not present in Australia, DWV is globally abundant and widespread, linked with *Varroa* mite populations. DWV is a significant threat, associated with elevated colony mortality. DWV causes wing deformities in developing bees, resulting in adult bees with twisted and shrivelled wings that are unable to fly.

Exotic



**Sacbrood virus (SBV)**

SBV is a moderate brood disease; it can infect adult bees but does not produce symptoms. Dead larvae are banana/gondola shaped: stretched on their back with their head raised toward the top of the cell. After death, larvae turn yellowish then brown. Skin of dead larvae turns into a tough, plastic-like sac that is filled with fluid.



**Asian hornet (*Vespa velutina*)**

Asian hornets are invasive predatory pests, originating from Asia. Hornets prey on adult honey bees and brood, significantly reducing colony productivity. Worker/forager Asian hornets are 25 mm long with orange-yellow face and black-brown body. Abdominal segments are bordered by a fine yellow band. Legs are brown with yellow tips.

Exotic



**Braula fly (*Braula coeca*)**

Present in Tasmania, Braula fly are a small wingless fly that are a minor pest to honey bee colonies. Adult flies are red-brown, 1 mm wide by 1.5 mm long, hairy with 6 long legs. The flies attach to adult bees (usually queens) and steal nectar and pollen. Fly larvae tunnel under wax cappings, leaving tracks across honeycomb.

Exotic



**Large hive beetle (*Oplostomus fuliginus*)**

Native to sub-Saharan Africa, adult large hive beetles feed on honey bee brood and are capable of causing significant damage to colonies. Adult beetles are shiny black, oval-shaped, ~20 mm long (larger than adult honey bees). Beetles avoid sunlight and will hide in crevices and under material.

Exotic



**Small hive beetle (*Aethina tumida*)**

Significant beehive pest; restricted to the Kimberley region in WA. Beetle larvae are 10 mm long, white with a tan-brown head, and leave a slimy residue throughout hives that damages combs and contaminates honey. Severe infestations can cause a 'slime out' that causes bee colonies to die or abscond. Adult beetles are red-brown, oval-shaped, 5-7 mm long.



**Wax moths (*Galleria mellonella* and *Achroia grisella*)**

Wax moths are a moderate pest, feeding on wax, pollen, and bee larvae. Moths are usually considered a symptom of a weak colony, not the cause. Adult moths are 10-19 mm long, dull grey in colour. Larvae are creamy white, up to 25 mm long. Symptoms include white cocoons in hives and silken webbing and tunnels through combs.



**Tropilaelaps mites (*T. clareae* and *T. mercedesae*)**

Native to Asia. *Tropilaelaps* mites are external brood parasites that transmit viruses and cause parasitic mite syndrome and colony decline. Mites are oval, 1 mm long by 0.5 mm wide. Adult mites are fast-running, often seen moving rapidly across the brood combs. Juvenile (larvae/nymph) mites are white and found in the brood cells.

Exotic



**Varroa mites (*V. destructor* and *V. jacobsoni*)**

Native to Asia, invaded most beekeeping countries. *Varroa* are external parasites of brood and adult bees that deform bees, reduce bee lifespans, transmit viruses, and cause parasitic mite syndrome. Infested colonies will die without intervention. Mites are small (1.1 mm long by 1.5 mm wide), oval-shaped, flat, and red-brown.

Exotic

WA Distribution: ● Endemic ● Restricted ● Exotic



### European honey bee (EHB) (*Apis mellifera*)



The only naturalised honey bee in WA. Importation of all honey bees is prohibited, and beehive products and used equipment are subject to strict quarantine conditions. EHB are ~14 mm long, covered in pale hairs, with an unevenly striped abdomen (mostly orange at base and black at tip).



### Asian honey bee (*Apis cerana*)



Native to Asia, present in Queensland. Bees appear similar to EHB, but are smaller (10 mm long), less hairy, with a uniformly striped abdomen. Nests have multiple combs (like EHB), but are smaller, often in smaller, man-made cavities (i.e. letter boxes).



### Giant honey bee (*Apis dorsata*)



Native to Asia. *A. dorsata* are similar colour to EHB, but considerably larger (17-20 mm long). Nests are a large (up to 1.5 m wide by 1 m long) single-comb, built in open air, i.e. hanging from a branch or cliff. Considered to be the most defensive honey bee.



### Red dwarf honey bee (*Apis florea*)



Native to Asia, has invaded Middle East and Africa. Bees are small, 7-10 mm long, with red-brown abdomens and even black and white stripes. Nests are a small (usually less than 25 cm wide) single-comb built in open air, i.e. wrapped around a branch.

Report all suspected cases to 1800 084 881

Note: bee silhouettes are a guide to approximate bee length only.

## Reporting bee pests and diseases in Western Australia

This document is a guide only. Honey bees are susceptible to additional pest and diseases. Some endemic bee pests and diseases are reportable in WA. Please check with DPIRD's Apiary team for reporting obligations. All suspected cases of exotic bees, pests and diseases, and any unusual symptoms, must be reported immediately by calling the **Exotic Plant Pest Hotline 1800 084 881**.

Suspected cases of reportable endemic pests and diseases (for example Small hive beetle and American foulbrood) in WA must be reported to DPIRD as soon as practicable. To make a report, email the DPIRD Apiary team at [PBhoney@dpiird.wa.gov.au](mailto:PBhoney@dpiird.wa.gov.au) or use the **MyPestGuide™ Reporter** app or website [mypestguide.agric.wa.gov.au](http://mypestguide.agric.wa.gov.au).

For more information about these pests and diseases visit [beeaware.org.au](http://beeaware.org.au). For information about honey testing, preparing samples for DDLS, and bee biosecurity in WA visit DPIRD's website [agric.wa.gov.au/bees](http://agric.wa.gov.au/bees) or email [PBhoney@dpiird.wa.gov.au](mailto:PBhoney@dpiird.wa.gov.au).

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