



BEEKEEPING BASICS – PESTS AND DISEASES

Varroa mite

Varroa mites are one of the most widespread and destructive honeybee pests. They can severely weaken the bees, and also carry damaging viruses.

Background

Varroa destructor is a pinhead-sized mite that parasitises honey bees and their brood. They can severely weaken the bees, and also carry damaging viruses.

The mites live on adult bees' abdomens and feed on tissue called the "fat body". The mite reproduces inside brood cells, with the young mites parasitising the developing bees.

Although they originally adapted to exploit Asian honey bee (*Apis cerana*), Varroa has more recently adapted to using the European honey bee (*Apis mellifera*) as its host. Varroa mites feed on bee larvae and adult bees. These external parasites also spread viruses, wreaking further havoc in the hive.

Varroa mites originated in Asia and spread to all continents. Australia had remained varroa free until 2022, when there was an outbreak detected at Newcastle port in NSW.

Physical description & lifecycle

Adult females are a rusty red-brown and measure 1-1.8 mm (around 1/16 inch) in length. They are round and flat, and can be seen with the naked eye, especially when against a light-coloured background.

Varroa mite life cycle has two phases. The first phase is known as the phoretic phase. During this phase, mites will ride on adult workers and drones feeding on their bodily fluid. If there is brood for the mites to parasitise, this phase lasts 5-11 days. Otherwise, it can last as long as 6 months, during which the mites will spread disease as they hop from host to host.

The mites then move onto brood as they enter their second, reproductive phase. After entering the cell, they move underneath the larva to feed on the prepupa. The female lays her first egg 60 hours after the cell is capped, then one every 30 hours.

Up to a half dozen will reach maturity within a week, feeding on the bee, impeding its development, and exposing it to disease. They mate, then adult females will leave the cell with the damaged bee, transferring to other bees, and the cycle begins again.

How it affects the hive & spreads

Varroa mite numbers build up in a hive over time and the buildup can occur rapidly. The mites weaken the bees, spread numerous diseases and hinder brood development. If management strategies are not applied then the colony will die out.

Varroa mites spread easily within a hive, reproducing on the brood and attaching themselves to adult bees. They can spread to new colonies, through robbing, drifting, swarming and absconding. They may also spread through other flower-feeding insects, such as flies and bumblebees.

Beekeepers can spread varroa mites when moving combs from one hive to another, moving bees to a new apiary. They can travel on clothes, equipment or vehicles.



2 varroa mites on a bee emerging from its cell

Symptoms & detection

As well as a decline in the population of the colony, Varroa mites will result in deformed pupae and adult bees. Varroa mites are most attracted to drone brood and if present, you should be able to see them against the white background of the pupae.

There are a few different methods you can use to monitor your colonies for varroa. These can be incorporated into your regular brood inspections. You may be required to check for varroa mites a certain number of times per year, depending on your local regulations.

ALCOHOL WASH

This method involves collecting a sample of bees from the hive and washing them in alcohol. You then count the number of mites to get an estimate of how many mites per bee are in your hive.

SUGAR SHAKE

This method works on a similar basis to the alcohol wash method, although it is less effective.

DRONE UNCAPPING

Because varroa mites prefer to reproduce on drone brood, uncapping drone cells is a quick way to check for varroa that requires little equipment.

Sources

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Beekeeping requires specialist skills, carries inherent dangers, and is often subject to regulation. Instructional content we provide is intended as a general guide only and may not be applicable to your specific circumstances. If in doubt, seek assistance from your local authority, a professional beekeeping service or your nearest beekeeping association.

STICKY MAT MONITORING

Putting a sticky mat at the base of a hive can help to detect mites, but should be used in conjunction with other more effective monitoring techniques.

Prevention, treatment & control

Good husbandry and hygiene can reduce the spread of varroa mites. In many areas where mites are present, eradication is not possible, and beekeepers need to work to control the number of mites in their colonies.

IPM

Integrated Pest Management is an environmentally sensitive approach to managing pests that integrates knowledge of the pest with a combination of practices and control methods.

The goal of IPM in the context of beekeeping is to avoid harm, reduce pesticide use and maintain the health of honeybees. With this method, beekeepers try to prevent mites primarily through cultural and mechanical controls. When chemical controls are needed, start with the least toxic option before using more toxic controls.

CULTURAL CONTROLS

Cultural controls are preventative techniques that reduce the ability of the pest to reproduce. They include: keeping bees with genetic resistance to mites, using foundation with small cell comb and interrupting the mite's reproduction through a brood break.

MECHANICAL CONTROLS

Mechanical controls are methods that involve physically removing mites from the hive. Mechanical controls include: sugar dusting to increase bees grooming, using a screened bottom board and adding drone comb to the hive. Mites prefer to reproduce in drone comb, which can be removed before the mites emerge.

CHEMICAL CONTROLS

While cultural and mechanical controls can be effective in suppressing mite reproduction and keeping numbers down, there are times when chemical treatments may be necessary. When using chemical controls, start with the least toxic options, and only move onto more toxic methods as a last resort. Only use as indicated and follow all label directions and safety precautions.

Soft chemicals are derived from natural substances, they are not persistent and they do not contaminate wax or honey over the long term. Soft chemicals have not been shown to negatively affect bee health, and mites have not built up resistance to these products in the same way as they have to some hard chemical treatments. Soft chemicals include: thymol, formic acid, oxalic acid and hop-beta acids. If the other methods of control have not been successful in reducing the mite load, you may consider using a harder chemical such as Amitraz. Hard chemicals are synthetic compounds. Varroa mites quickly developed resistance to some hard chemicals such as tau-fluvalinate and coumaphos.

It is important when using chemical treatments to follow the label and to rotate different chemicals to avoid resistance developing.

Picture Credits

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