



# Integrated Pest Management

Lancaster Beekeepers advisory leaflet No 11

Honey bees are basically very healthy creatures and not prone to many diseases. However, the arrival of the parasitic mite *varroa destructor* in 1992 changed everything!



Adult female varroa mite

Varroa mites originated in southeast Asia, where they are a parasite on the Asian honey bee (a different species). When European honey bees were taken to the region, the mite crossed over to the new bees. Gradually they have spread until most of the world's European honey bees are afflicted.

Varroa mites attack both the adult bee and bee larvae and, if left unchecked, will destroy a colony. They also significantly weaken the bees' natural resistances making them increasingly susceptible to other diseases.

Defra's initial reaction was to prescribe chemical treatment to combat varroa. Initially this was highly successful, but has now led to resistant strains of varroa.

**Integrated pest management involves utilising a range of different approaches to control the numbers of parasites without the risk of further resistance developing.**



Varroa mites compared to a match head

The following notes outline the practices and treatments currently in use. However, it has to be said that not all of these are proven to be effective and little valid research has been carried out on the long term effects.

**In order to keep yourself and your bees safe, you are strongly advised to seek expert help before using any treatment. The fact that a treatment is included here does not infer that it is recommended by Lancaster Beekeepers.**

## Apiguard

Apiguard is thymol in the form of a slow release gel placed in a tray on the hive floor. The thymol evaporates and the fumes disperse around the hive. As this only occurs at temperatures above 15°C, it cannot usually be used in the Spring.

### **Apistan**

Apistan is a pyrethroid based medication that comes in the form of impregnated polymer strips. Inserted into the hive for 8 weeks, usually in the autumn, this treatment initially was highly successful. However, persistent usage has resulted in resistant mites. There are concerns that pyrethroid residues may occur in honey crops therefore usage is recommended after honey has been harvested.

### **Apivar**

Apivar is a rigid strip impregnated with Amitraz as its active ingredient. It is distributed throughout the hive by bees contacting the strips then contacting other bees and can be used any time the bees are active.

### **Bayvarol**

Bayvarol comes in the form of polymer strips impregnated with Flumethrin, a synthetic pyrethroid. It is used in exactly the same way as Apistan.

### **Comb replacement**

Bees will use the same drawn out comb for many years, which permits the possibility of diseases and pests building up within the comb. Replacing old comb with new foundation on an annual rotational basis reduces this possibility.

### **Drone culling**

Varroa mites prefer to lay their eggs in drone cells. The bees are encouraged to produce drone cells on specific combs which are then removed and destroyed. This is a highly effective way of reducing varroa numbers but concerns are now being expressed about the longer term effects on the colony of significantly reduced drone numbers.

### **Dusting with icing sugar**

Western honey bees regularly groom themselves but, unlike Eastern honey bees, their grooming does not appear to be effective against varroa. By regularly dusting bees with icing sugar, which they can eat, it was thought that the bees would groom themselves more vigorously and remove some varroa. Evidence that this occurs is variable.

### **Exomite**

Exomite is a thymol based powder which is placed in a small tray by the entrance to the hive forcing the bees to walk through it as they enter or leave the hive. The bees disperse the powder throughout the hive, which then evaporates. As with all thymol based treatments, this only occurs at temperature in excess of 15°C.

### **Open mesh floors**

It is claimed that varroa mites regularly fall off bees. Where the hive has a solid floor, the mites simply climb back up and find a new host. Fitting hives with open mesh floors means that the mites drop out of the hive and are unable to climb back. This method is said to be effective in reducing mite numbers but will not, on its own, reduce mites to acceptable numbers.

### **Oxalic acid**

Oxalic acid in the form of a 3.2% oxalic acid/sugar solution is trickled between the frames in the hive. Whilst highly effective in killing varroa, it can also kill brood, therefore should only be used when there is no brood present such as during the winter

or when housing swarms. Recently, concerns have been expressed about the longer term effects on adult bees. The latest research claims that vapourised oxalic acid is highly effective in killing varroa mites without adversely affecting honey bees. Experimentation has taken place using other organic acids such as lactic, acetic, formic and citric acids but little is currently known about their effectiveness or longer term effects.

### **Shook swarm**

This involves removing a hive from its site and replacing it with a completely sterilized hive containing new foundation. The original frames are then shaken vigorously over the new hive so that all the house bees fall in. The flying bees will return to the hive site of their own accord. The adult bees can now be treated with oxalic acid. The frames, comb and brood from the original hive are destroyed, usually by burning, and the original hive sterilized.

### **Thymol**

See Apiguard

**Integrated Pest Management** involves 3 steps:

- regularly monitoring levels of infestation
- using a range of chemical and non-chemical procedures on an appropriate and rotational basis
- practicing regular and effective apiary hygiene.

### **Monitoring levels of infestation**

Checking for signs of disease should be an integral part of regular hive inspections. If any unusual behaviour or signs of deformity appear, consult an experienced beekeeper, your local beekeeping club or a regional bee inspector.

Additionally you should regularly monitor the number of varroa mites that naturally fall onto the floor of the hive. To do this you will need to have a removable solid floor, possibly marked out into a grid, and coated with something sticky to trap any live mites. If, in any 24 hour period, you find more than 5 mites, you could have a problem and should seek help. Occasional partial drone culling can give a good indication of varroa levels.

### **Appropriate treatments and actions**

Regular comb replacement and the use of open mesh floors are recommended at all times.

If your bees appear to be healthy, and your monitoring does not show any significant signs of infestation, chemical treatments are probably not appropriate.

If chemical treatments are necessary, try to rotate between thymol based, pyrethroid based and oxalic acid based treatments to reduce the risk of building mite resistance.

### **Apiary hygiene**

Apiary hygiene involves:

- regularly washing bee suits and veils
- using disposable latex gloves
- regularly disinfecting Wellingtons

- regularly disinfecting hive and other tools
- cleaning, sterilising and storing unused hive components
- removing hive debris from the apiary and disposing appropriately

There is a growing number of beekeepers who prefer not to treat their bees with any type of chemical and claim that their losses are no greater, and in many cases less than, those who treat their bees. This topic is highly controversial.

**IF IN ANY DOUBT SEEK HELP FROM YOUR LOCAL BEE CLUB BEFORE A PROBLEM BECOMES A DISASTER.**

**[www.lancaster-beekeepers.org.uk](http://www.lancaster-beekeepers.org.uk)**