

VARROA MANAGEMENT without Pyrethroids

Monday 8 October 2007 – talk to Edinburgh & Midlothian Beekeepers

WHY ORGANIC ACIDS?

I recommend that beekeepers become familiar with the use of organic acids as an alternative to pyrethroid treatments. Why organic acids? Primarily, this method of treatment ensures the wax in our colonies and the supers in particular, are free from chemical residues, so we can be sure that the honey we collect and eat/sell is a clean, natural product.

Also, as pockets of pyrethroid-resistant varroa mites spread through the UK, we can expect resistant mites here some time in the future. Then we shall *have* to use non-pyrethroid methods, so it is good to be familiar with these.

The MITE COUNT

Seldom used by commercial beekeepers but important for the amateur, at least until you have confidence that your annual treatment plan is working well, a count of the mite drop will give you an estimate of the varroa infestation in your colonies, and therefore when they must be treated.

Insert a tray beneath the mesh floor of the hive, if using an open mesh floor, or an insert into the entrance to cover most of the floor, and leave for a week or so. Count carefully afterwards – a magnifying glass is handy for this – to find the daily mite drop. (Drawing a grid of, say, 8cm sq on the tray or insert helps the counting.) Then apply a formula to find the varroa infestation level (see copy of Graham Sharpe's notes).

Aims always to avoid treating for varroa during the honey flows: honey and treatments do not mix. So Autumn, Winter and Spring are the times to protect your bees from heavy infestations and, if necessary, take advantage of the "June gap" to treat a heavily infested colony in risk of collapse.

INTEGRATED MANAGEMENT TECHNIQUES

David Wright discussed these and did a survey of those present. It seems most local beekeepers are using more than one method of controlling varroa, with open-mesh floors becoming popular and several members applying oxalic acid trickling, or using Apiguard.

THYMOL & APIGUARD

Display **old thymol kit** ... explain bees not unhappy around thymol. I had drone brood in the thymol frame for a while. Not sure of efficacy, though would be inclined to pop the frame into a nucleus or small colony without a super, if I thought they need a quick fix and I was short of time to apply formic acid.

Apiguard comes with clear instructions ... the handicap in Scotland the ambient temperature.

Treatment is for 4-6 weeks and it works best when the outside temperature is around 15°C, so Spring treatment, before honey is being collected, is usually not possible.

Likewise, after the harvest in late Summer, it may be getting too cold to gain the maximum benefit from Apiguard.

However, very easy to use.

PROTECTIVE KIT & SYRINGE/AEROSOL SPRAY

When using organic acids always have a large supply of water nearby in case of splashing on skin or eyes. THESE ACIDS ARE DANGEROUS and must be handled and stored carefully. You will need:

- Protective goggles
- Rubber gloves
- Ideally, a 100ml or 200ml syringe (vets use them and may be able to supply)
- Optional, an aerosol spray, for oxalic trickling
- For oxalic acid sublimation, a face mask of high quality is essential.

ACID TREATMENTS

NOTE: All the acid treatments are well documented and I offer some internet sources in this text, so I am not planning to go through the detail of the methods, rather to explain them in general and to encourage you to try these methods if you have not done so already.

OXALIC ACID

Oxalic acid, produced by ants, is found in small quantities in honey and bees have a good resistance to it. Its use to treat against varroa is simple, if you use the trickle method, and it is inexpensive. Both this and formic acid are known to be highly effective against varroa, if used correctly.

Trickling method – Oxalic acid used in the recommended strength, does not harm the bees but kills varroa. However, unlike formic acid, it does not pass through the wax cell caps to kill varroa within the brood cells. So, this treatment needs to be carried out when there is little or no brood in the colony – ie in the middle of Winter.

Because it is carried out in mid-Winter, some say it is cruel to the bees but, in my experience, they seem to survive the treatments without apparent strain or loss. However, apply only ONE treatment. Bees are known to die with two or more treatments.

Buy as crystals – dilute carefully in warm water, with a little sugar to encourage grooming by the bees. Follow instructions carefully – from Graham Sharpe's course if you have attended or see:

www.biavl.dk/english/oxalic_acid_trickling_method.htm

www.algonet.se/~beeman/research/oxalic/oxalic-O-nf.htm

Sublimation – David Wright discussed this method – the vaporising of the oxalic acid into the hive entrance. He showed slides of the equipment and treatment.

FORMIC ACID

Formic acid vapour kills varroa mites both on the bees, and within the brood cells, so it may be used at any time of year in a colony which has no honey supers in place. It penetrates the outer shell of the varroa mites which is much thinner than that of the bees, and it destroys their skeletons and cells.

It is said that the oldest brood in a colony may be damaged by this treatment – and indeed, I noticed a few hardened larvae which had been cleaned from cells, in one of the colonies I treated in September. But generally, provided you follow the guidance carefully, the bees will come to no harm.

The acid is heavier than air, so it is distributed around the hive by the bees own ventilation.

Bought in concentrated liquid form, it is HIGHLY CORROSIVE and dangerous if it gets on your skin or in your eyes, so great care is needed in its handling. I have bought 60% concentration on the past but recently bought 90% and diluted it – 100ml water to 500ml acid – to about 75%. Be sure to pour the acid, slowly, into the water, not the other way round. Then if it does spit that will be mostly water, rather than acid.

Krämer or other absorbent boards – most commonly used in Germany – I have not tried treating in this way – I prefer to keep a physical barrier between the bees and the acid but this may simply be my prejudice!

Nassenheider and other evaporators – I found one I believe is much better than the Nassenheider, via eBay, and they cost less than £2 each. This was displayed at the meeting.

Some say formic acid treatment is time consuming ... bit that may not be a problem for the amateur beekeeper.

I tested the three colonies in my garden immediately before September treatment, and immediately afterwards. The results were as follows:

| | <i>Daily mite drop before treatment</i> | <i>Daily mite drop after treatment</i> |
|--------|---|--|
| Hive 1 | 7 | 4 |
| Hive 2 | 14 | 10 |
| Hive 3 | 5.5 | 1.5 |

I feel these results either tell me that the mite fall has still not settled down after the treatment, or it has had very little effect! However, I have found it has been effective in the past. Sp perhaps the mites take a while to die off and drop?

This treatment is not a cheap option: I recently paid £40 for 2Lt of formic acid having used up a 500ml bottle on my colonies this Autumn. An evaporator is needed in each brood box so, if like some of my bees, they are on doubles, they need twice the amount of acid – two doses of 100ml each at a concentration of 60-80%. Diluted to around 75% as I do it, you can treat 3 brood boxes per 500ml of 90% formic acid: so about £4.45 or so per colony on single brood boxes. Maybe someone can find a cheaper local source of formic acid?

For details of these treatments – the correct acid concentrations and quantities to use – see:

www.biavl.dk/english/varroa-english/formic-acid-freely.htm

www.dave-cushman.net/bee/nassentest.html

SOURCE OF ACIDS

Mackay and Lynn Ltd
18/7 Dryden Road
Bilston Glen
Loanhead, EH30 9LZ
0131 448 0818

www.mackayandlynn.co.uk

They will supply formic and oxalic acid and, of course, acetic acid for keeping your empty boxes clean in the Winter/Spring.

Thank you for your interest and I wish you well managing varroa in your colonies.
Please email me via the website if you would like more details.

Kate Atchley