

Bees:

more questions than answers

by Kathryn Johnson



Kathryn has worked in the voluntary and local government sectors on environmental issues, performance management, equality and community engagement. She is currently working as a consultant and undertaking an Open University science course.

As the temperature climbs to 13°C and the hives are opened after the winter, beekeepers will be only the first of many people anxious to assess the health of the bees after recent years' devastating losses. The cause, identified as a weakened constitution due to infestation by the varroa mite, and geographically spreading resistance to chemical solutions, would seem to make this an ideal opening for homeopathic treatment – but there appear to be few takers for the remedies. Kathryn Johnson reviews recent research, conventional approaches and spoke to three beekeepers who have used homeopathic remedies.

Our universal dependence on a healthy biodiversity and the bee as essential pollinator places its value beyond calculation. Economically, about a third of our food crops depend on pollination by bees and DEFRA estimate the value of commercially grown food crops dependent on pollination at £120–200m a year. This seems an extraordinarily small sum; Richard Girling in the Sunday Times put this at £1bn (2009). The National Audit Office's recent report estimated the value of honeybee pollination at about £200m across ten categories of food and identified apples, pears, raspberries, strawberries and other orchard and soft fruit as particularly vulnerable (2009). Honey production in contrast is worth some £10–30m a year (DEFRA, 2009).

According to DEFRA, there are some 44,000 beekeepers maintaining around 274,000 colonies of honeybees. Of these some three hundred are commercial bee farmers managing about 40,000 colonies.

Colony losses

Colony losses have fluctuated historically and are often greatest with severe weather. The last seven years, however, have seen a steadily rising trend from 6% in 2003 to about 12% of colonies inspected and found dead by UK Bee Health

Inspectors in England & Wales in 2008. Again Richard Girling quotes a significantly higher figure of 30% losses in 2007 and the Cooperative Group corroborate this in their Plan Bee. Feral colonies are now seen rarely. There have been similar losses in other countries though, in the United States for example, different viruses may be associated with colony collapses.

A study by the National Bee Unit (NBU) of colony losses in 2007 found that the majority of bees from colonies lost that spring contained damaged wing virus (DWV), a virus associated with varroa infestations. In the summer chronic bee paralysis virus (CBPV) and nosema ceranae were linked with a large number of losses but nevertheless the NBU concluded that DWV was still the best risk indicator of a weak or lost colony. Nosema ceranae was confirmed for the first time in the UK that year, and was found in 37% of colonies collected during the summer. When found together, DWV and CBPV doubled the risk of bee death and dead bees had twice the number of pathogens as live bees. The recent National Audit Report concludes:

Attempts to control the spread of varroa in honeybees have not prevented it from becoming endemic in England.

It ceased to be a notifiable disease in March 2006.

This appears to confirm the commonly held view that infestation by the varroa mite leaves the bees weakened and vulnerable to other viruses leading to loss of colonies if infestation is not controlled.

Conventional treatments for Varroa destructor

Varroa destructor (previously known as Varroa jacobsoni) is an external parasitic mite of the Asian honeybee *Apis cerana*, which can tolerate it. At some point it was introduced to the native Western honeybee *Apis mellifera* and has spread to all continents except Australia. It was first found in Devon in April 1992, probably through movement of infested bees, and has since spread throughout the UK. *Apis mellifera* has few natural defences against varroa and if left untreated the colony will die. The mites feed on both the blood of adult bees and on the brood, weakening the bees and spreading bee viruses. They breed within brood cells.

Pyrethroid treatments have been used to control varroa in the UK since 1992 but, as expected, resistance developed and was found in the south west by 2001. Cross-resistance pertains to the two active ingredients, flumethrin and fluvalinate, of the two pyrethroid based treatments authorised in the UK, Bayvarol and Apistan respectively (DEFRA, 2005).

DEFRA now recommends 'integrated pest management' (IPM) based on good husbandry and a range of treatments dependent on the results of monitoring of mite population (csl.gov.uk). The



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Ann Procter of Somerton first worked with Helios in 1994 on development of the *Varroa* remedy and then, when it became apparent that varroa infestation led to vulnerability to other bee viruses, to the development of the combination remedy too. Ann produced a bulletin for a number of years and made over 50 contacts. (Perhaps the couple who took Ann's files to do research but who disappeared would put the world to rights by returning the paperwork to her.) Ann has not kept bees for about eight years now because of arthritis and does not wish to be contacted but her Summary Bulletin dated January 2009 is available from Helios.

Ann used *Varroa* 30 initially, later with *Bee virus* 30, fortnightly. She was advised by a homeopathic veterinary surgeon to dose more frequently in winter when the bees' metabolism was lower. She put about ten drops of the remedy into the top of the colony, down the feedhole. She did not advocate diluting the remedy in water or syrup, as it was not necessary and may contaminate it. Ann was aware that some beekeepers do not like to open the hives in winter at all but in her experience it was not necessary to disturb the cluster and the effect on the temperature inside the hive was minimal, especially if the drops are just put on top. Ann treated her bees in this way over a number of years and only twice used Bayvarol, on an alien swarm and on a nucleus so they would not infect her own colonies. She counted natural drop of varroa mites regularly and numbers remained low, so she felt positive about the method. She recommended it to other beekeepers with the advice to count mite drop and a reassurance that a varroicide could be administered at the appropriate time if the count rose to threatening levels.

Bees are essential pollinators

biotechnical methods, drone brood removal, comb trapping, artificial swarm and open mesh floors, involve the physical removal of mites. The pyrethroids still form part of the recommended approach but beekeepers are advised to test for resistance, only use them August to October and to stop using immediately if resistance is found. The management regime refers to several other varroacides of varying effectiveness. Only one, Apiguard, is authorised in the UK, though some are 'tolerated'. Thymol is the active ingredient of Apiguard; thyme contains volatile oils with potent antimicrobial action (White et al, 2000), is a very strong antiseptic and is effective in the control of many parasites (Price et al, 1994).

A homeopathic approach

Helios and Ainsworths supply the following homeopathic remedies:

- *Apium virus* (Ainsworth) 12c, 15c, and 30c
- *Bee virus* (Helios) 3c – 10M
- *Bee virus + Varroa comb* (Helios) 3c – 200c
- *Varroa* (Helios) 3c – 1M.

Neither company is selling much. John Morgan of Helios pointed out that, as these are based on the diseased agent rather than a similar substance, they are isopathic remedies and therefore on the fringes of homeopathic science. He added that this applies to about half of his remedy bank and this method of using remedies is still effective in appropriate cases.

DEFRA's recommended approach fits well with homeopathic treatments. The open mesh floors are fitted throughout the year. The other biotechnical aspects of IPM, the physical removal of varroa mites, take place in the first half of the 'active' season – April to July. ➤

Our universal dependence on the bee as essential pollinator places its value beyond calculation

Rob Coleman of York has been keeping bees since 1989. Starting with two hives he built up to 21 hives in summer 2007, using homeopathic treatments successfully and losing no hives to varroa or related viruses. A colony of wild bees lived in the trees adjacent to Rob's house for ten years until the greater wax moth, not varroa, killed them off a couple of years ago. Disaster struck in winter 2007 leaving Rob with seven hives. Rob blames himself for taking his eye off the ball while re-roofing and replacing the windows in his house, having too many hives to look after, failing to feed the bees and for creating too many small clusters. At least three colonies starved and one was found to have European Foul Brood in the regional Bee Inspector in April 2008. This hive was subsequently burnt. The remaining hives were shook swarmed (a method of shaking a colony from their old home into a new or freshly sterilised hive so as to separate them from pathogens which may reside in existing combs) and fed with ambrosia throughout 2008. At the time of writing, a quick look suggests all eight hives are okay. Rob cleans his hives each April or May and doses with ten drops of both *Bee virus* 30 and *Varroa* 30 on the top bars then, and each time he opens the hives after that, about every week. He does not dose in winter. He has open mesh floors and treats any strange or feral colony he brings home with Apiguard.

The bees do pick up varroa mites when they are out foraging but the mites don't seem to survive. The bees seem to shrug them off and the count has stayed low.

Homeopathic remedies can be combined with this good husbandry, without any negative impacts on each other. If daily mite mortality remains <6 by July no further action is necessary. Only if the daily mite mortality rate rises to >6 by July or >4 in August does DEFRA recommend an appropriate varroacide and Apiguard may be selected. (Timing of application is affected by actual numbers of dead mites and other action is recommended for >8 in October so check details of DEFRA advice.) It is only if daily mite mortality rises to >8 that DEFRA recommends a 'high efficacy varroacide', in other words one of the chemical treatments based on pyrethroid.

The National Audit Report concludes that DEFRA's effectiveness is hampered by incomplete information on the location of beekeepers and their colonies and recommends that beekeepers register on Beebase and that DEFRA improve their working relations with industry associations (NAO, 2009). Inspectors only visit registered beekeepers. Training on recognition, notification and treatment of disease is available.

Research

After a high profile campaign by beekeepers, DEFRA announced an increase in resources for the bee health programme in January 2009. As is often the case, it is difficult to be certain what this £4.3

million extra is being added to – and it falls somewhat short of the £8m requested. It appears that the National Bee Unit budget is £1.3m for 2009-10 and 2010-11 and it will now get an extra £1.1m and £1.2m in those years respectively to implement the bee health strategy. An extra £400k will be added to the existing c £200k for research for each of the next five years. However, £500k of this will be allocated to a new research programme which will 'consider the wider problems facing pollinators' rather than the bee problems themselves (defra.gov.uk). DEFRA has also recently established a Research Funders' Forum with other potential funders (NAO, 2009).

The Co-operative Group have also stepped in with £150k to support research into the demise of the honeybee as part of their 10-point Plan Bee (www.co-operative.coop). The research will focus on UK farming, pesticides and gene-diversity. At the same time Co-operative Food will temporarily prohibit the use of neonicotinoid-based pesticides on own-brand fresh produce. These are Acetamiprid, Clothianidin, Dinotefuran, Fipronil, Imidacloprid, Nitenpyram, Thiacloprid and Thiamethoxam. Wildflower planting and bee-keeping will be extended on Co-operative farms and an education and awareness-raising programme will aim to encourage Co-operative members to be more bee-friendly.

The varroa mite and bee viruses are not the only possible threats to our precious bees

This does raise the fact that the varroa mite and bee viruses are not the only possible threats to our precious bees. The Co-operative Group has addressed pesticides and lack of biodiversity in their programme. Others have considered the possible impacts of GM crops (www.spiegel.de) and the extension and intensification of electromagnetic fields, arising from mobile and other communication technologies. These are beyond the scope of this article but it should be noted that some authors question whether it is assaults from some or all directions that are proving too much for the humble bee. Investigations can be difficult as often the bees simply disappear. The DEFRA research programme will focus almost entirely on diagnosis, understanding and controlling exotic and other serious endemic pests and diseases. An argument may be made that the scope should be extended to cover such other issues as these, along with efficacy of homeopathic remedies, under a reference to 'provide data by research to identify and assess threats to Bee Health in

Peter Atkinson of Cambrose started with a small nucleus of bees from a friend in 1985. He built up to 30 hives but cut down as he got older and now has five hives. He used Apistan in the past. For the last ten years he's used homeopathic treatments in combination with Apiguard and though he has lost some colonies to varroa says, 'it works for me'. He puts about ten drops of *Bee virus* + *Varroa comb* 30 in a half litre of water and sprays the bees when he goes to the hive, instead of using smoke, about once every three weeks. He also sprays the entrance. Peter also cleans his hives on the first visit of the season, puts in clean floors and removes old combs when they have become wet or mouldy, and puts in new foundations. He rakes the soil around the front of the hives to make sure there are no varroa lurking there too. All five colonies were doing well in mid-March.

Peter is part of a small group of homeopaths based around Truro who are talking to Helios about a new varroa and bee viruses remedy.



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England and Wales including ... environmental health hazards' (ROAME) but significant pressure is likely to be needed to achieve it.

Interestingly, the European Food Safety Authority's announcement of €100k for a nine month project to identify causes of Colony Collapse Disorder (CCD) and to highlight gaps in scientific knowledge to guide future research seemed to have a more open approach:

The cause of CCD is not known, although various factors are thought to be responsible including starvation, viruses, mites, pesticide exposure and climate change.

The UK's Central Science Laboratory will be one of a consortium of European scientific institutes carrying out the research. This research builds on a project on bee mortality and bee surveillance in Europe. That report was published in August 2008 and states:

All member states have a monitoring programme for residues in honey as required under Directive 96/23/EC. In Directive 86/363/EEC there are no pesticide residue MRLs set for honey, so residue monitoring in honey focuses on residues of veterinary medicinal products and environmental contaminants. The following of veterinary medicinal products and environmental contaminants that have also been used for plant protection have been detected at non-compliant levels in honey: streptomycin, pyrethroids, organochlorine compounds and organophosphates.

Bees hummed around his ears with an intimate air, and tugged at the heath and furze-flowers at his side in such numbers as to weight them down to the sod. (*The Return of the Native*, Thomas Hardy 1878)

Beekeepers have had devastating losses in recent years

In September 2008 the Regulation 396/2005, which includes temporary MRLs in honey, will be applicable. Therefore, future monitoring programmes will include data on specific active substances in honey. (www.efsa.europa.eu)

A challenge

In the meantime, the honeybee is in trouble and homeopaths have a role to play in encouraging their local beekeepers to adopt good husbandry methods and try out homeopathic remedies. There is nothing, and certainly no time, to lose.

Kathryn Johnson is keen to hear from other beekeepers using homeopathic or other complementary remedies at KathrynJohnson@blueyonder.co.uk.

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