

Central Science Laboratory - National Bee Unit

South East Update

Introduction

As cold weather finally arrives and we can start to put the 2002 beekeeping season behind us, this edition of the NBU South-East region newsletter aims to bring you up-to-date with the latest bee-health news and developments from our region and beyond.

Foulbrood 2002

This year there has been a noticeable decrease in the number of confirmed foulbrood infected colonies compared with recent years - both in the South East region and in England and Wales as a whole. This has been most pronounced for European foulbrood – the position for American foulbrood is complicated by the discovery of a single outbreak of nearly 200 colonies in the Midlands – the largest found for very many years.

Here in the South-East, European foulbrood has for a long while been much the more widespread of the two diseases and this year was no exception. In total 186 EFB infected colonies in 61 apiaries were found – about a third fewer than has been typical over recent years.

It is hard to be sure why the incidence of EFB has apparently decreased this year. Part of the reason may be the generally poor weather that restricted inspections by bee inspectors and beekeepers alike. However, it is also possible that the new approaches that we are introducing for controlling EFB – such as shook swarms -are starting to have a general impact.

There was a very pronounced difference in the incidence of EFB in the counties within our region. Worst affected was

West Sussex both in terms of the number of colonies infected (67) and proportion of inspected colonies found to be diseased (12%). This was followed by Surrey (49 cols, 8%), Greater London (40 cols, 5%), Kent (26 cols, 2%), and East Sussex (4 cols, 0.7%).

In the most seriously affected areas there is a considerable way to go before EFB is brought down to a reasonable level. However, with the combined effort of beekeepers and bee inspectors this is entirely possible. To illustrate this, it's worth remembering how badly Kent was affected with EFB not so many years ago. However over recent years the incidence of EFB has steadily decreased to its current low level.

American foulbrood remains an unusual disease in the region: this season 9 colonies in 2 apiaries (near Walthamstow, London and Horsham, West Sussex) were confirmed to have the disease. In view of the seriousness of AFB we have made particular efforts to trace the source of infection but in neither case was this found.

This is quite often the case with AFB - perhaps because infection is sometimes acquired not from other colonies but by bees gaining access to imported honey containing AFB spores. We will be continue to monitor the situation in the affected areas next year.

Of all the foulbrood cases confirmed in the South East this year, 80% were found by bee inspectors during their routine visits, and 20% after beekeepers contacted us because they suspected



disease. As ever, this is a figure we would like to see increase.

Further details of the distribution of confirmed foulbrood infected apiaries are given in the map and report attached to this newsletter.

Varroa resistance surveillance

Since the discovery in August 2001 of varroa mites in the South West resistant to pyrethroid based treatments (Apistan and Bayvarol), bee inspectors throughout England and Wales have stepped up testing for resistance during their apiary visits.

Many beekeepers will now have seen the simple test kits we are using for this work. Essentially the test works by exposing varroa mites within a sample of adult bees to a low-dose pyrethroid strip. Most susceptible mites are killed whereas most resistant mites survive. By calculating the proportion of mites present that are killed, an indication of the extent of resistance is obtained.

In this region, we concentrated our efforts mainly on testing colonies that gave particular cause for concern. These were often those where the mite population was noticeably higher than would be expected –suggesting that perhaps treatments applied may not have worked properly. We also tested colonies where it was evident that pyrethroid strips had been left in the hive for a long while – sometimes several years – which provides ideal conditions for resistance to develop. Worryingly, these colonies sometimes also had an enormous mite population!

However, the tests carried out in the South East so far have found no resistance and indicated that pyrethroid treatments are still working very effectively. This does not mean that there

is definitely no pyrethroid resistance in the South East - but it is encouraging.

The position in the South West is not so good, however. Resistance surveillance this season has revealed relatively widespread resistance in West Devon and large parts of Cornwall. This autumn, bee inspectors in the region have been kept very busy helping beekeepers control pyrethroid-resistant mites by treating their colonies with non-pyrethroid based treatments under the terms of a Special Treatment Authority provided by the Veterinary Medicines Directorate.

For beekeepers in the South-East, it is unfortunately inevitable that pyrethroid resistance will reach us sooner or later - although it is impossible to be certain when this will be. In the meanwhile, the best advice for all beekeepers is to monitor varroa levels to check that any pyrethroid treatments used are still working effectively.

We are encouraging beekeepers to carry out their own resistance tests either using resistance test kits on loan from the NBU or by making their own kits as described in the CSL leaflet 'Managing Varroa', and to submit the results of their tests to the NBU.

Further details of methods of resistance testing, forms for submitting test results and regularly updated maps showing the current extent of confirmed pyrethroid resistant varroa are available on the NBU website, www.nationalbeeunit.com.

Honey sampling programme

Few people can be unaware of the issue of unwanted contaminants in honey after the discovery of antibiotic residues in Chinese honey hit the headlines earlier this year. Many beekeepers found that as a result English honey was suddenly in great demand with consumers!



Probably not everyone had previously been aware that routine testing of both imported and home-produced honey has been occurring for some while as part of the Veterinary Medicine Directorate's testing scheme that checks for residues of veterinary medicines and other contaminants.

In the past, samples of honey for testing were obtained from shops, but there were problems in cases where British honey was blended with imported honey. Consequently this year the arrangements were changed, and for the first time CSL bee inspectors were involved in collection of honey samples for the VMD.

Overall, this year we have collected around 100 samples from beekeepers in England and Wales – about 15 of which were from the South East. These included samples from a cross-section of beekeepers including small-scale producers and bee farmers.

Each sample will be analysed for one or more veterinary medicine residues (such as pyrethroids, antibiotics etc.) or other contaminants. The beekeepers concerned will be notified of their individual results by the VMD, and the overall findings of the scheme will be published by the VMD in due course.

If any residues are found, the VMD will investigate how they may have arisen and advise on they might be avoided in the future. If illegal substances or very high levels of authorised substances are found then there is a possibility of legal action.

However, there are no reasons to anticipate finding widespread problems and it is hoped that this scheme will provide a good opportunity for beekeepers to demonstrate the safety and quality of the honey they produce.

New developments in bee health

During the season, bee inspectors in the South East have been participating in a number of the NBU's current research projects. We are very grateful to the beekeepers who volunteered to be involved, without whose help this work would be impossible.

Many beekeepers will now be familiar with the shook-swarm trial which over the past few years has been comparing this method of controlling EFB with conventional approaches.

It will be some while before full results are available because we need to monitor treated colonies for several years to see whether the disease later reoccurs. Despite this, preliminary results are very encouraging, and suggest that shook swarm treatment can be a very effective way of eradicating EFB from diseased apiaries. We have many beekeepers – including large-scale bee farmers – who now consider it a key part of their disease control strategy.

We have also been continuing our involvement with the LINK funded trial of the novel biological control for EFB known as 'PLP' (short for *Paenibacillus larvae* subspecies *pulvificiens*). Again, full analysis of the results will take some time, but preliminary results show some promise.

Lastly, we have been involved in a development of a completely new method of diagnosing bee diseases developed over the past year by CSL with funding from Vita (Europe) Ltd. This is based around small hand-held test kits known as Lateral Flow Devices (LFDs). These are similar in appearance and principle to pregnancy test kits.

Based on monoclonal antibody technology, the LFD is both extremely



sensitive and reliable. Recently they have begun to be widely used in a variety of areas – in particular for the diagnosis of plant diseases in agriculture.

In use, a small sample of suspect diseased material is placed in a dropper bottle, and shaken to make a liquid suspension. A drop is then placed on the LFD, and passes into device. After a short delay dark lines develop in a clear window showing the presence or absence of the disease tested for. Each LFD is used once only and is then disposed of.

So far a LFD test for AFB has been developed, tested in the laboratory, and is now beginning to undergo testing in the field. A similar test for EFB is expected next year. So it is more than likely that many beekeepers in the South East will soon see their inspectors using these devices in their apiaries for the first time.

Once field-testing is complete, it is anticipated these will be routinely used by bee inspectors and also available for beekeepers to use to test their own colonies.

On the horizon: small hive beetle

The incredible spread of varroa across globe in recent decades teaches us that we must always be prepared for the possibility that bee health problems affecting other countries may spread to the UK despite our wishes and best efforts to the contrary.

In this respect, the announcement in October 2002 that the small hive beetle *Aethina tumida* had been found for the first time in Australia is very significant.

The background to this event is that the small hive beetle is a native of South Africa, where it is not usually considered a serious pest. However, in 1998 it was discovered in the Florida and has since

spread over several states in the eastern part of the USA. Here - for reasons that are not fully understood - it has proved to be a very serious and economically damaging problem for the beekeeping industry.

Both adult and larval beetles live in beehives where the larvae cause serious damage by eating brood and honey. Their excrement contaminates honey causing it to ferment. Damage to the colony becomes very severe, often eventually causing the adult bees to abscond. Small hive beetles are also a serious pest of stored comb and can quickly ruin full supers prior to their extraction.

Spread of the beetle is thought to occur through the movement of beekeeping equipment, soil from around hives and even by the movement of fruit, which adult beetles may eat. For control beekeepers in the USA have had to resort to the use of insecticides in and around their hives.

Although the small hive beetle has not been found in the UK, its arrival in Australia where strict controls on importation of potential pest species exist shows that this unfortunately is a distinct possibility. Indeed, it is even possible that it is here already!

Consequently it makes sense for beekeepers to keep an eye open for unusual beetle activity in their hives. Adult small hive beetles are about a third the size of a worker bee, black or dark brown in colour, oval in overall shape with short wing cases that allow a few segments of the abdomen to be visible from above and clubbed antennae. Small hive beetle larvae closely resemble wax moth larvae but have two rows of spines along the centre of the back. Needless to say, beekeepers who suspect they have found small hive beetles should send them in a



suitable container for identification to the National Bee Unit at the following address: National Bee Unit, Central Science Laboratory, Sand Hutton, York, YO41 1LZ.

Talks, advice and training

When many people think of the NBU's team of bee inspectors, they tend to think mainly of the inspection and disease control work we do. But an increasingly important element of our work is the provision of help, advice and training to beekeepers.

This year in the South East region, bee inspectors have been busy in this respect. So far between us we have taken part in about 50 talks, training sessions and practical demonstrations speaking to over 800 beekeepers in the process.

These have ranged from informal demonstrations in the apiary (for instance on brood disease recognition) through talks and lectures to beekeeping associations (for instance on managing pyrethroid resistance) to beekeeper training days at CSL in York.

I am now taking bookings for next year, and beekeeping associations wishing to become involved are invited to get in touch with me to discuss their requirements.

Bee Inspector changes

This year has seen significant staff changes in the South East region, and some resulting changes to inspection areas covered by seasonal bee inspectors. Firstly, we were joined in May by Nick Withers, who has been working mainly in East Sussex for most of this season – and visiting many beekeepers who we haven't seen for many years in the process.

Meanwhile Alan Byham has been covering less of East Sussex and extended his inspection area further into West Sussex. Peter Bowbrick has been covering North and West Surrey as last year and Trevor Davis have been again been covering his usual area of East Kent.

Finally, at the end of the season we saw the retirement of Dennis Geoghegan who has covered West Kent and South-East London for the past ten years. Few bee inspectors can have more experience in recognising and controlling foulbrood than Dennis, and his retirement brings a great loss of expertise to our region.

Before next season, I expect to be recruiting at least one more bee inspector. This vacancy will be advertised in the usual way, but individuals who are interested are invited to contact me now so that I can make sure they have all the details when the time comes.

New varroa calculator

Several years ago the NBU produced a varroa calculator which was intended to be a simple tool to help beekeepers estimate the population of varroa in their colonies, and to predict when treatment might next be required.

Since then there have been significant developments in our understanding of some aspects of varroa population biology, and significant improvements in our use of mathematical models to simulate realistic seasonal development of a honeybee colony and the changing varroa population within.

As a result of these developments the NBU has recently produced an updated and improved varroa calculator for beekeepers. Taking advantage in recent technological developments, the new calculator does not take the form of its plastic-disc predecessor, but instead



exists as a page on the NBU's website www.nationalbeeunit.com.

Although complex in its operation, the new calculator is simple to use. Essentially it consists of a form in which the user first identifies the method of monitoring they have used, and then records the number of mites they have counted. From this information the calculator estimates how many mites are likely to be present, and how long it will be before they are likely to reach a harmful level.

Full instructions are provided on the web pages along with further reading on varroa population modelling for those who wish to explore the subject in more detail.

Topical tip: more reasons to replace old comb

Probably most beekeepers are aware that they keep brood combs in use far longer than is ideal for their bees – it's all too easy to get to the point where they are closer to black than brown, and with almost as many drone cells as worker cells.

Old brood combs can harbour pathogens responsible for a wide range of debilitating or devastating bee diseases, and this alone should provide a good reason for putting them on the bonfire or melting them down. Winter days, free from other beekeeping demands provide an ideal opportunity to do this.

However, if further encouragement is required, two new pieces of research published in the past year may provide additional reasons. In the first, David Wilkinson of the NBU used the new varroa model referred to above to simulate the effect of having differing amounts of drone brood in the brood nest of a varroa infested colony. The results suggest that where drone brood is very plentiful – as in colonies on very old

combs – the varroa population increases very much faster than is the case in colonies with very little drone comb. The difference is enough to make a big difference in the amount of varroa control that will be required to keep the colony alive.

In the second study, Thomas Seeley in the USA maintained two groups of otherwise similar colonies – one with a large proportion of drone brood in the brood combs - and so a correspondingly large drone population; the other had very little drone brood and correspondingly few adult drones. Seeley found a big difference in the honey yield of the two groups, with the low drone colonies producing very much more honey. He attributes this to the energy cost of producing the additional drones and fuelling their flying activities – both of which have the effect of burning up sugar that would otherwise remain as surplus honey.

So the message is: get rid of those old combs. Not only might they be making your bees ill, they also make it much harder to control varroa and may also significantly reduce your honey crop!

Postscript

Although it seems rather early as I write this in early November, for those of you I will not see until 2003 I wish you all a Happy Christmas and New Year, and I hope that next beekeeping season brings you much honey, few swarms, well behaved healthy bees and all the other things that as beekeepers we often wish for but don't always seem to get!

James Morton
South East Regional Bee Inspector

