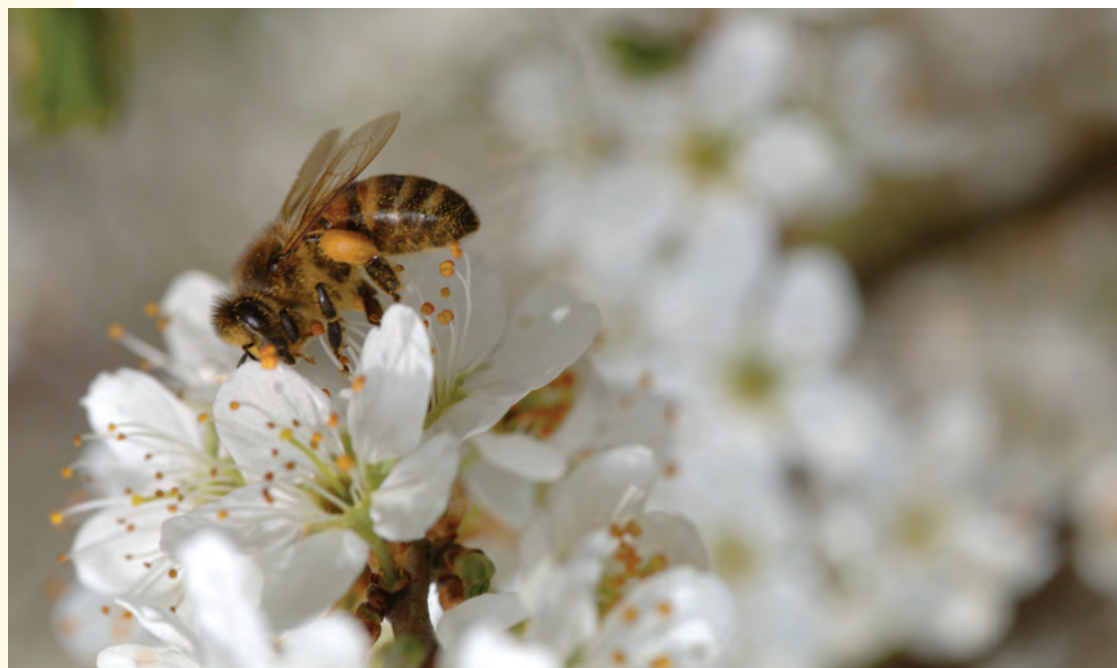


BBKA News

The newsletter of the British Beekeepers' Association,
incorporating the **BRITISH BEE JOURNAL**



No: 189 – May 2011



© David Wootton



In the apiary:
Colony expansion will be seen now and regular inspections will be needed to control swarming, see page 4.



Honey bee anatomy:
A new series that will take us through the anatomy of the honey bee, starting with the head — see page 13.



Bumblebee 'swarm calls':
Advice on how to handle 'swarm' calls from the public — and how to find out what the worrying insect is, see page 15.

Healthy Bees Plan: Your Questions Answered

What is it?

A ten-year programme funded by Government to improve the health of the nation's bees in response to the concern about wide-scale losses of colonies both in the UK and overseas. The efforts of the BBKA in bringing these losses to the attention of the public were instrumental in the fund being set up.

Is it achieving anything?

After a slow start; yes it is. The plan has partially funded the development of the Course in Case training materials and some higher level training modules written by National Diploma in Beekeeping holders. It has also partly funded events for those involved in the training of beekeepers.

Has it been affected by Government cuts?

Yes; the amount of money put into the fund was £1.1m for each of the first two years. Year three (2011–2012) funding has been approved but with a cut of 50%. Funding for future years will depend on proving its worth in the early years.

This means there are very few resources available during the coming year to provide joint funding for educational initiatives.

Are there any other benefits?

The funding enabled additional Seasonal Bee Inspectors to be employed in 2010–2011 and these have largely been retained during 2011–2012. Beebase (<https://secure.fera.defra.gov.uk/beebase/>) has been revamped and has the potential to become an important source of information for all beekeepers. Disease alerts can now be emailed to those in the area and beekeepers are encouraged to supply their email addresses.

The BBKA has started to work with the NBU, scientists and other beekeeping groups in a co-operative way.

What about other threats to beekeeping?

The HBP cannot of itself prevent the spread of the Asian Hornet or Tropilaelaps for example, but the shorter lines of communication it has generated does mean that new information can be discussed and agreed with beekeeping groups and disseminated to everyone very quickly and accurately. Further details of the HBP can be found on page 5.

Martin Smith, President



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Chairman's Letter

I was asked by the Ulster BKA to open and address their annual conference recently and am pleased to report the conference had the highest attendance in its 67-year history, with many delegates taking their first beekeeping steps. This conference and the organisation of our own Spring Convention made me realise that we need beekeeping members at both local and national level to get involved in helping to make our organisations work. The satisfaction gained by being involved and making any event a success can be extremely rewarding.

By the time you will read this letter we will be nearly halfway through 2011 and my mind is beginning to turn to finding Trustees to help run the BBKA in 2012 and beyond. In national elections the problem political parties have is getting voters interested in voting. The BBKA has the opposite problem — we have no difficulty in getting associations to vote, our problem is getting members to come forward for nomination.

We have been fortunate in my time as a Trustee that the quality and commitment of Trustees who have worked alongside me has been excellent. While they have maintained their independent views on issues and vigorously argued their particular viewpoint they have without exception accepted the majority view. At the 2012 ADM we will have vacancies for at least five Trustees (including President) and if members want a strong and representative executive then contested elections are essential. Can I, therefore, ask members and officers of associations to discuss where our next set of Trustees will come from? If anyone is interested in becoming a Trustee and wants more information do give me a call to discuss this. If you want to make a difference to beekeeping in this country this is the route to take.

What do Trustees do? Well among many things, they manage the charity in accordance with Charity Law, organise our National Shows, talk to Government, talk to and seek out potential sponsors and suppliers of services, and help design and implement information leaflets and marketing information. So, please come forward if this interests you.



Brian Ripley, Chairman, BBKA

Ron Brown

We are saddened to hear of the death of Ron Brown, OBE, on 2 April 2011. Ron Brown was a BBKA Honorary Member who for many years was an active member of Devon BKA. There will be more about Ron in June BBKA News.

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In the Apiary

The busy season is now upon us with colonies building up rapidly and possibly making preparations to swarm. Regular colony inspections made every seven to nine days are necessary to identify colonies that are making these preparations. On first finding a colony that is preparing to swarm it is generally acceptable to destroy any queen cells, provided that the queen is present. However, repeatedly carrying out this procedure demoralises colonies and they do not perform well.

Collected swarms invariably perform brilliantly and by using artificial swarm techniques swarming impulses can be harnessed for our benefit. New beekeepers need to understand the natural swarm principles, learn to recognise queen cells in their various forms that are often tucked away and easy to miss, and learn how to carry out an artificial swarm. The system known as 'Pagden' is simple, and when carried out effectively and understood, more refined systems such as 'Heddon' or 'Snelgrove' should be tried. One of the biggest problems is that apiarists do not have enough equipment to carry out artificial swarms so make sure you have enough hives, frames and foundation at the start of the season.



Honey bee swarm on a tree branch. Photo: Christine Knott.

It would appear that many of us have difficulty in controlling swarming, so improving our stock to be less 'swarmy', better tempered and more productive is a worthwhile goal. I suspect that few beekeepers make any reasoned attempt to do this by keeping records and selecting, instead they just leave the bees to develop their own queens. This is probably because most beekeepers have fewer than five colonies and think it would be difficult. However, it is not difficult to do, so get together as an association or group of beekeeping friends and set up a queen rearing unit. If there is someone experienced to lead the way, so much the better, but if not make your mistakes and learn together. The feeling of elation when your new queens are laying well and showing desirable qualities will be immense.

No beekeepers like using chemicals to control pests and diseases so the use of management with what is known as biotechnical methods needs to be considered. As a generalisation in beekeeping these are used in spring and summer. They can range from changing brood combs, to reducing spore or bacterial levels such as with chalk brood, nosema or EFB infections, to trapping methods for controlling pests such as varroa. In this latter category it is easy to adapt artificial swarming in order to remove varroa mites. This can be up to 90% effective, which is very much higher than you can expect from dusting with icing sugar over an extended period. There are two key principles of importance. Firstly, flying bees do not generally carry phoretic* varroa mites until the colony is verging on collapse. Secondly, when colonies are broodless a frame of open brood can be inserted and the phoretic mites will enter the brood to reproduce and continue their life cycle. When this brood is sealed over the frame can be removed and the comb destroyed along with the majority of the colony's varroa mites. The timing of this is important as if carried out too early it will destroy the bee brood that would have hatched into foragers during the main honey flows and if

too late it will destroy bee brood that would have taken the colony into the winter. As a rule late May and June are ideal for this procedure. In the UK most parent colonies of swarmed colonies become broodless before the new queen is mature, mated and laying thus leaving a window of opportunity. (*Phoresy, adj phoretic, is the phenomenon of an individual being carried on the body of a larger individual of another species.)



Varroa infestation, courtesy of The Food and Environment Research Agency (Fera). Crown Copyright; images supplied by the National Bee Unit at Fera.

Early honey crops may need to be harvested this month especially in the case of oil seed rape. 'A nuisance at best and a disaster at worst' is a phrase often used and if you, like me, have bees half a mile or so away from this crop then the bees will forage on it seeding the other spring nectars. This causes it to granulate in the comb unless you promptly harvest and extract it when ripe. Do not wait until the end of the summer. As a beekeeper I prefer to either take bees to the oil seed rape and maximise the crop or make sure they are not within flying distance of it. To reduce the risks of granulation it is important to keep the colony wholly intact to maintain warmth in the supers and when the honey is ripe remove the frames quickly and immediately extract them.

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The Healthy Bees Plan: An End of Year Report From the BBKA's Perspective

What is the Healthy Bees Plan?

The Healthy Bees Plan (HBP) is an initiative set up by the Government in response to the widely publicised threats to beekeeping in this country with the aim of ensuring a healthy and sustainable honey bee population for the benefit of the whole country.

It is a ten-year plan funded by the Department for Farming and Rural Affairs (Defra) and the Welsh Assembly Government (WAG) and is administered by Food and Environmental Research Agency (Fera). 31 March 2011 marked the end of the second year of its ten year programme.

It is a completely separate initiative from the Insect Pollinator Initiative (IPI), which is a £10million fund with various sponsors and which is funding a series of research projects. Progress on this will be reported at the IPI Colloquium at the BBKA Spring Convention 2011 and will be summarised in BBKA News.

BBKA involvement

The BBKA, as a major stakeholder, was on the main governing body of the HBP from its outset and I, as Chairman of the BBKA at that time, was one of our representatives. In the initial months we had concerns that it would simply be an expensive 'talking shop' and other than endless meetings nothing would actually be achieved. We therefore withdrew from the plan.

One of the key objections we had initially was that the board could not in itself do anything; it would ultimately have to rely on beekeepers and others to do the work. At the time it was our view that we could achieve this work without being 'hamstrung' by the constraints of government officials.

This was, to a degree, borne out by the fact that in the first year of its existence a good proportion of the budget was not spent for lack of suitable projects.

After an absence of around nine months the BBKA rejoined the HBP having received assurances that it was now able to either do or fund some actual work that would benefit our bees. I and other BBKA representatives have since attended the meetings and participated in the HBP on behalf of BBKA.

What have we achieved?

1. Course in a Case

As has been reported elsewhere in BBKA News we had started to develop a range of teaching aids, called Course in a Case (CiC). The BBKA was able to tap into funds that were available in the HBP to accelerate the rate at which the individual modules were developed. The first two cases (white and yellow, for beginners and novices respectively) have now been on sale for several months and the sale price was kept at £50.00 to groups and individuals training beekeepers partially as a result of some of the funding.

Additional funding was also used from the HBP budget to bring forward the development of the next two levels (red and green, for improving and proficient beekeepers) and these have now been completed and will go on sale shortly.

The funding model agreed on with Fera was a cost-sharing one, with the BBKA paying half of the overall project costs and HBP funding the other 50%. This fits nicely with the Big Society exposed by David Cameron recently as a way of making government funding go further.

2. National Diploma in Beekeeping

The project board of the HBP also agreed to fund some higher level modules being written by members of the National Diploma in Beekeeping (NDB) board. We have large number of relatively new beekeepers and it is important to ensure that their tutors can continue to lead them through their studies as they progress. These modules have been written on certain specific topics such as balanced nutrition and floral sources, and adult disease diagnosis, and they enable in-depth training sessions to be given by NDB qualified beekeepers to those interested in training other beekeepers at a more advanced level.

3. Delivery of training

Producing training aids is only the start of our work. Real benefits will be seen once the aids are more fully distributed and used by our trainers and beekeepers undertaking established BBKA courses. With this in mind, our third strategy, which has been funded by the HBP this year, is delivering a series of regional training events which explain the concept of the CiC to local beekeeping trainers. These events have also explained the resources that are available centrally to assist local trainers.

Nationally directed training

Organising training events regionally, but funded centrally, is a new venture for the BBKA. Historically all training has been undertaken at local level supplemented with some regional events (such as county conventions). The examinations system is run centrally, but the BBKA has not had the financial resources to be able to offer anything in addition to this.

Some regional and local training is excellent (and, in fact, has formed a model for national training) but some is not coping well with the strains imposed by all the new beekeepers. Often local training has been undertaken by one or two willing volunteers who have excellent beekeeping skills; so much so that they can put off others from joining the training efforts locally. This in turn presents a block on the numbers of beekeepers that can be trained; one or two trainers simply cannot provide the training needs of a group of one hundred people.

The new regional training events attempt to champion best practice



across the country, explaining this to a wide audience of beekeepers who are interested in training others. They will help give these people the tools they need to start to expand the high quality training in their local association. These tools include both beekeeping teaching resources and tips and hints on how to teach others. If we can assist in breaking this 'log jam' in some areas then it will have been worth it.

Other work of the HBP

This article has focused on the education aspect of the HBP, which is the one closest to my heart. Other funds, however, were used to employ additional Seasonal Bee Inspectors and the funding for these has been retained for 2011–2012. In addition, a significant amount of money was spent on a Random Apiary Survey, the results of which will be available later this year, but see page 20 for an interim report. There are also several other aspects of the HBP, such as the Science and Evidence group and the Communications group. All of this work has been reported on from time-to-time in BBKA News and I do not propose to dwell on it here.

The HBP helps build relationships

From my perspective one of the main benefits of the HBP has been the bringing together of those interested in bees and beekeeping. Beekeeping groups at local level can often be run in a very insular way, not learning from others in their area. The same applies to regional or county associations and indeed the national BKAs.

The HBP has enabled the BBKA to work more effectively with the Welsh BKA and to a lesser extent with the Scottish BKA. Other relationships that have been strengthened include those with our 'regulators' (Fera), our inspectors (NBU), many scientists and with beekeepers themselves.

The future

Government cuts have meant the HBP funding for 2011–2012 has been reduced. However, funding has been secured to continue to employ the additional Seasonal Bee Inspectors and to retain the Regional Education Co-ordinator who is planning a further series of apiary-based events during the summer and training sessions during next winter. More about this on page 24.

To a large extent the HBP must now prove its worth during 2011–2012. A reasonable sum of money was spent in 2010–2011 and it is now up to us to prove that it has been money well spent. From my perspective, if it helps towards more skilled and informed beekeepers then it will have paid for itself many times over.

Has it been worth it?

The BBKA and Defra/Fera have had our differences and some things have not gone as smoothly as we might have wished. We have generated lots of emails and meetings, endless paperwork and contracts thick enough to act as doorstops, but overall we have set the foundation for a way in which Government and beekeepers might work together.

We will continue to have different priorities, but at least now we perhaps understand each other's perspectives a bit better and this must be a good thing.



Martin Smith, President



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The Artificial Swarm Technique and its Uses

Swarming is a natural impulse and a phenomenon that beekeepers can exploit to both the honey bees' and the beekeeper's advantage. Successful swarm management is very satisfying.

Many beekeepers today juggle their beekeeping with work, family and other commitments. So the amount of time they can allocate to beekeeping is limited and has to be used in the most efficient and effective way. One of the most difficult events to plan for and deal with is colony swarming.

There are techniques, for example the provision of extra space and cutting out queen cells that can be used to prevent or discourage colonies from swarming. However, they all can result in varying degrees of success. Whichever techniques are used the objective must be to work with the bees allowing them to satisfy their natural rhythms and at the same time accommodating the beekeeper.

The preparation and use of the artificial swarm is a technique that can be used in swarm management and the limited amount of space available for this article means that all aspects of artificial swarming cannot be included. This article is intended as an introduction for those starting their beekeeping careers.

Early signs of swarming

Many beekeepers will start the process of regular inspections in early spring and will continue to monitor the colonies until they observe the development of queen cells, the appearance of drone brood and increasing numbers of flying drones; all of which indicate that the developing colony could soon start preparations for swarming. By and large the swarming window in spring is fairly consistent within any given area and new beekeepers should ask local experienced beekeepers for their views on the most likely swarming period. Timing is affected by weather and if good forage is available the colony will grow rapidly.



© David Wootton. By inspecting the colony regularly for the presence of queen cells and drone brood you can stay one step ahead of the colony's preparations for swarming.

When to carry out an artificial swarm

Beekeepers who have less time to inspect their colonies according to a set timetable can adopt another approach by taking a quick look for the presence of drone brood with its characteristic domed cappings

without taking out any brood frames. The development and sexual maturation time for a drone is around 36 days after the egg is laid so you can calculate when to start preparing for the colony to swarm. At some point, determined by a combination of local knowledge, time constraints or the observed state of development of the hive you can artificially swarm the colony to prevent it swarming. Provided eggs and young larvae are present and there is good weather you can artificially swarm a colony even if at the time of carrying out the artificial swarm no queen cells are observed.

If the artificial swarm is removed before the parent colony has started to produce queen cells, then the parent colony is put in an emergency situation and will attempt to produce queen cells from two to three day old larvae. These older larvae will produce 'scrub' queens. It is therefore important to remove such queen cells and only leave those that have been produced from very young larvae.

What is an artificial swarm?

The basic principle underpinning the artificial swarm technique is the establishment of the queen and a substantial number of the bees of a foraging age on new foundation on the original site (this is called the artificial swarm). It will settle down, draw new comb and begin to raise new brood. It may require feeding to help draw the foundation. The remaining brood and nurse bees (now called the parent colony) will raise queen cells but may need feeding to stimulate it if forage is scarce and the weather is cold and wet. The syrup feed should be sugar syrup (one part water: one part sugar) to stimulate feeding. If the colony was already producing queen cells the best cells can be selected for subsequent development. If only eggs and larvae were present the frames should be examined three or four days after the artificial swarm was made and then one week later to check on the development of the queen cells. Only select good size queen cells, especially ones protruding from the face of the comb with rough, sculptured surfaces to the outside of the queen cells. If good cells have not been produced the parent colony can be reunited with the artificial swarm or a new queen introduced.

Uses of an artificial swarm

The use of the artificial swarm technique enables the beekeeper to gain control of the timetable of developments and then plan and prepare for the actions to be carried out. The artificial swarm technique can be used to achieve a number of objectives, including:

- ❑ Maintain colony numbers.
- ❑ Increase colony numbers.
- ❑ Requeen colonies.
- ❑ Control disease, including varroa and associated viruses.

How to carry out an artificial swarm

The creation of the artificial swarm is achieved as follows:

- ❑ Move the colony to be artificially swarmed onto another stand about ten metres away from its original position.
- ❑ On the original stand place a floor, a queen excluder and brood box and fill it with frames of foundation leaving enough space for a comb of sealed brood and a dummy frame.
- ❑ Go through the parent colony and find the queen. Do not shake any frames on which there are queen cells as this could dislodge

and separate the developing queen larvae from their food.

- ❑ If necessary transfer the queen onto a frame with sealed brood and no queen cells and put the frame into the brood box containing the foundation; hold her in place with a queen marking cage while you make the transfer. By this time bees will be flying from the parent colony back to their original site and begin to cluster inside the hive. At this point the queen can be released and a crown board and roof fitted. This colony will start to draw out the foundation and the queen will start to lay eggs. If the original colony had supers with honey in them these can be placed above a queen excluder on top of the brood box, or
- ❑ Alternatively the colony can be fed one part water to one part sugar syrup. We will now call this Colony A.

In order to ensure there is a mix of worker ages in the artificial swarm transfer bees from combs which contain honey and from combs which have developing brood, making sure you do not shake frames on which there are queen cells you might want to use.

The parent colony containing the remainder of the colony and queen cells can be managed in a number of ways. If the parent colony needs to be stimulated to produce the queen cells by feeding once the queen cells have begun to develop they can be managed in the same way. Either:

- ❑ Two unsealed queen cells containing healthy larvae can be selected and the rest of the queen cells cut out. The colony can then be left to rear these queen cells and will select the queen to head the new colony. We will call this Colony B.
- or
- ❑ If there are several queen cells on several frames the colony can be split up into nuclei and the frames with the selected unsealed queen cells (maximum of two per nucleus) distributed between the nuclei. The bees and combs of stores should also be distributed between the nuclei. We will call colonies raised this way Colony C.

The new colonies can then be allowed to develop. The entrances should be plugged with grass to prevent robbing and after a few days it can be removed from the entrance, which ideally should be kept small to enable the bees the guard against robber bees and wasps. Leave the nuclei for at least two to three weeks before opening them up to check whether there is a new laying queen present.

How new colonies can be used

The following list of options is not exhaustive.

- ❑ Colonies A and B can continue to be raised separately and so the number of colonies is doubled.
- ❑ Colonies A and B can be united using the newspaper method having removed the queen from Colony A, so the new colony is a combination of A and B and has been requeened. The combs from Colony B (which will be older and therefore have a higher disease risk potential) once all the brood has hatched in Colony B can be removed and disposed of. If the original queen in colony A has desirable characteristics and may be useful for raising other new queens from her she can be established in a small nucleus of her own. It is advisable to rear queens from colonies which only



© David Wootton. A swarm collecting on a tree.

produce around ten or so well-developed queen cells at the time of swarming.

- ❑ In the C type colonies the queens are allowed to develop and mate. Again leave them for at least two to three weeks before checking for a new queen and developing brood. These new queens can then be used to requeen other colonies, or if the nuclei are strong, to be developed into new full size colonies.

Conclusion

The artificial swarm technique, through the removal and replacement of old comb, contributes to reducing the potential for the development and transfer of a number of brood diseases such as the foul broods and nosema.

A modification of the technique described above can be used as a biotechnical control for varroa and this is described in the leaflet called 'Managing varroa' available from the National Bee Unit (NBU) and on-line in BeeBase.

The use of the artificial swarm technique can help the beekeeper manage swarming in a way which is beneficial to the bees and the beekeeper.

Dr David Aston, NDB



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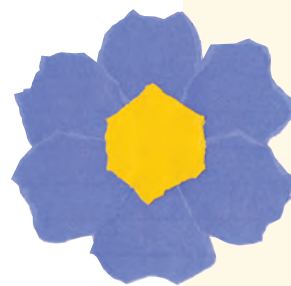
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Beekeeping Notes For Beginners

May —Time to Grow



May is when the colony really starts to grow. It is responding to increasing day length and increasing nectar income. This tells the workers (and hence the queen) that it is time to grow the colony as part of preparations for swarming; the bees natural way to increase the number of colonies. At this time of year things happen very quickly — you need to be prepared and be able to devote time to the bees on at least a weekly basis.

Reading lessons

It is important to start to develop your ability to 'read' the brood nest at this time of year. There are many signs to look out for and after a while some of these will become instinctive, but in the meantime here are some tips to get you started...

- Temperament of the colony is always an indication of something — get used to each colony under a variety of weather and handling conditions. A colony that becomes more tetchy may have lost its queen or may have disease problems. It is also possible that the hive has 'changed dad', i.e. the queen is laying eggs fertilised from another drone in her multiple matings. The new adults may also change colour for the same reason.
- Look for the pattern of capped and uncapped brood. You should see a ring of sealed brood moving outwards on the frames, possibly with a second cycle of egg-laying starting at the centre.
- Read the PROPORTIONS of workers in each juvenile stage. Remember the basic 'Rule of 3': three days as an egg, $2 \times 3 = 6$ days as a larva and $4 \times 3 = 12$ days in the capped cell prior to emergence. If you think carefully about this, a brood nest working well in a steady state will have one 'unit' of cells containing eggs to two units containing larvae (uncapped) to four units containing sealed brood. Don't get too exact about this, but get into the habit of estimating if this is the case as you inspect brood frames. Loss of this sequence, for instance no eggs and only mature larvae, or only sealed brood means that the colony is getting ready to swarm. Why? — I'll explain later on.
- Keep an eye out for the queen — mark her if you can, or get help from a more experienced beekeeper to do this. Now is a good time to mark queens, the smell of the marking paint/fluid will have less effect on a strong colony.
- Signs of swarming BEFORE it happens start in subtle ways. The colony will have started to generate drones; do you know how to recognise drone cells on the edge of the brood? This is where they should be. Drone cell 'clusters' or 'odd peaks' in worker brood indicate possible queen fertility problems. Although these drones are unlikely to mate with the new princesses from this hive, the timing is general to the local area.
- Another signal of impending swarming is the presence of 'play' queen cells in the brood nest — these look like little acorn cups and are usually left unfinished. However, there is a risk that you will regard a 'real' queen cell as a play cell until it is too late, so consider gently flattening these play cells with a hive tool.
- The queen has to fly with the swarm. While she is in full egg-laying mode, her ovaries are full of eggs in production and this adds considerably to her body weight, making flying difficult. Her retinue will start to reduce her stimulative feeding as part of the swarming process and her egg-laying rate will drop dramatically. When this happens, the 1:2:4 ratios between eggs, larvae and sealed brood will be disrupted. This early sign of impending swarming is why you

have to become competent at spotting this change.

If you have failed to pick up these early signs, then swarming is now likely to be imminent, so look out for:

- 'Real' queen cells in the brood nest. Look for these at the bottom of the nest, but do not assume that this is the only place they will be made. Corners of the brood nest, especially where there is a recess in the brood comb, and on the face of the comb if there is a large space between frames are all possible locations.
- REMINDER: When inspecting at this time of year, be very careful to protect both queen and new queen cells; you need both. If you just lift frames while they are adjacent to each other you will 'roll' worker bees against each other and risk both upsetting the colony and damaging the queen. Equally, queen cells project a little and may also be damaged. Slide the frame away from the next frame by a cm or two before lifting.
- If you find real queen cells inspect them all carefully in a good light. This is one of the few times you need to hold a frame horizontally; make sure the queen is not on it. Is the cell nearly full-size? Is the inside base highly polished? Is there some royal jelly in the base? Can you see an egg (difficult) or larva floating on the royal jelly? These indicate swarming is imminent, in increasing order of urgency. See page 7 for more advice on swarm control.

Have you found sealed queen cells?

If you have it is quite likely that the colony has swarmed. If the bees are tetchy OR the colony seems smaller OR you cannot find the old queen it is almost certain that it has. In this case, leave the hive alone for at least three weeks and DO NOT open it. This will give the new princess time to mate and start egg laying. If you open it before, she may fly away and get lost.

The routine actions

While you are looking for signs of swarming, do not forget that you also have routine beekeeping matters to attend to in the colony. Aim to answer the following questions:

- Does the colony still appear healthy?
- Does the brood have lots of space to expand; lack of space may accelerate swarming behaviour
- What are your varroa levels? More brood cells mean more chance for these to breed. What IPM technique will you use next?

Income

Is there plenty of storage space for nectar? Supers can be filled very quickly; in just a few days. This time of year make sure that you have a super filled with both frames and foundation or some of last years comb in clean condition. Store it in a black plastic bag until needed. You may need to add a super quickly.

Adding supers

There is considerable discussion about how to add supers. The simple rules at this time of year are:

- Keep the super that is immediately on top of the brood chamber [Super 1] in that place for the season — it may become the feed super for next winter.

Are your bees healthy?

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- ❑ Place the next super [Super 2] on top of this. We will discuss how to add more supers later in the series.

Which foundation?

When preparing new super frames, remember that you have choices about foundation:

- ❑ Use unwired foundation if you want to harvest some cut comb. It is difficult to cut comb with wire in it! This foundation is often thinner, so take care with it.
- ❑ Use drone-cell foundation for more efficient honey storage. The ratio of wax cell material to honey storage space is better by about 20%.

Apiary hygiene

Keep working on your hygiene technique. Cleaning/changing gloves and cleaning hive tools between hives should be automatic by now. As the bees become more active, you will find yourself removing odd bits of brace comb, often sticky with nectar. Put this in a closed container until you can process it properly. Do not throw it on the ground or compost heap, this will spread disease and encourage robbing behaviour.

If you have small amounts of sticky comb that you have removed, place it between the roof and crown board OF THE SAME HIVE for a week. The bees will usually lick the honey off and re-store it in the hive. You can then remove the wax for re-cycling. If you have recycled wax from last year, now consider part-exchanging it for fresh foundation.

Wax Moth

Finally, a word about this perpetual pest. Wax moth eggs are very small and can be laid in any crack in hive woodwork. Although the low temperatures this winter will have killed off a good many adults and pupae, many will have survived. The juvenile forms of most insects take varying times to complete their life-stages and this is largely dependent on temperature. As the days warm up, the breeding rate increases. A few surviving moths will quickly lay in old hive equipment and infest the bee shed. Keep equipment stored so that it is moth-proof. It is a good idea to quickly flame-treat each component, especially in the cracks and joints (not the frames or wax!) before it is placed into storage — this will kill off eggs and small larvae. The equipment can be fully cleaned before its next use.

Wax moth infestations in the hive are almost impossible to deal with except by trapping individual larvae, which is slow, tedious, not fully effective and damaging to brood. There is no treatment that can be applied to the hive. Keeping equipment moth free helps. Strong colonies are good at keeping adult wax moths out of the hive; weak colonies are not so good. Also, remember that insert you put into the floor to monitor varroa? On the underside, there may well be many wax moth larvae — this is an ideal breeding ground. Clean BOTH SIDES of the insert at each inspection. If you can, scrape out the hive floor surface when the insert is out.

Chris Deaves,

Chair of Education and Husbandry Committee



Course in a Case

With the beekeeping season now well under way, many associations give 'taster days' or 'weekend' courses for people interested in the craft.

The **Beginners CiC** (white) is ideal for this. Although it is intended to be a 'winter' teaching aid, its contents can be adapted for use as part of shorter courses. In that way, new beekeepers can experience consistent material as they progress later on. What would make a good 'taster day' at this time of year? Well, thoughts now turn to practical beekeeping, so consider:

- ❑ Clothing and hygiene.
- ❑ How a colony works.
- ❑ Hive components and their uses.
- ❑ The beekeeping year.
- ❑ Experiencing simple manipulation at the hive and knowing what to expect.

Material for these topics is in the **Beginners CiC**.

If you are contemplating a 'weekend' event then you are intending that the students do more than just 'watch and play' at manipulating the beehive. In this case, a good systematic method of teaching manipulation and keeping bees calm is essential; even though this is only a short course habits picked up now will take time to undo. Material to support this kind of training can be found in the **Novices CiC** (yellow).

Finally, by the time you read this, all of you who have a **Beginners CiC** (white) will have received a survey form about how you have used it. Replying to this will give valuable information to help us plan and improve the CiC concept in the future.

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Bee Part of It! Adopt a Beehive



Do you think that Adopt a Beehive is nothing to do with you? — Think again!

Adopt a Beehive.co.uk is the only scheme in the UK which raises money for research and education to support the honey bee. Adopt a Beehive has been set up by the BBKA so that people can do something constructive to help the honey bee if they cannot take up beekeeping. All the profits are spent on applied research and education projects to help the honey bee and beekeepers, so please, encourage people to Adopt a Beehive with the BBKA.



Most of the welcome pack contents have been donated by Burt's Bees who also sponsor the scheme for £25,000 per annum to help cover operating costs. We include a 227g jar of British honey or 100g jar of honey mustard, but about 20% of customers take up the option not to receive either and donate the cost to the BBKA instead.

The most important part of the scheme is the newsletter called Hive Talk and the separate update with news from the Adopted Beehive, which are sent out quarterly to the Adopt supporters.

How and why 'Adopt' works

All the main animal charities like the WWF or RSPB offer 'adoptions' or 'sponsorships' as a way of raising money for their campaigns. You can adopt penguins, whales, monkeys, donkeys, avocets and even puffins — so why not Adopt a Beehive?



warm glow of knowing that they are helping a good cause. People cannot visit their Adopted Beehive or have honey from that actual hive; it is a 'virtual' concept, although the bees and beekeeper are definitely real.



There is a choice of fourteen different beehives to adopt. You can see them all at www.adoptabeehive.co.uk. Each beehive belongs to a member of the BBKA, who receives nothing for their involvement except the



How can you help?

Here are some practical ways you can help:

- ❑ Encourage people to buy an Adoption if they want to help the honey bee.
- ❑ Highlight Adopt a Beehive on your local association website or at your local centre*.
- ❑ Put up a poster about the scheme when you give talks or run events*.
- ❑ Suggest people Adopt a Beehive if they want to be part of the beekeeping community but cannot take it up as a hobby.
- ❑ Hand out leaflets about Adopt whenever you can; people want to help the honey bee*.
- ❑ Remember that buying an Adoption really is a good gift; it is nice to receive and supports an important cause.

*The National Beekeeping Centre at Stoneleigh has supplies of leaflets and posters to help you fund-raise through Adopt a Beehive. Supplies can be posted to you if you email register@britishbeekeepers.com

Win a designer necklace created especially for the BBKA

Alex Monroe is a famous jewellery craftsman and has designed a necklace based on our logo especially for the BBKA. It sells for £165 and for every necklace sold he donates £30 to the BBKA's Adopt a Beehive scheme. You can see the necklace on www.alexmonroe.com



Alex has also donated a necklace to the BBKA. Every person who supports our fund-raising campaign by buying an Adoption between now and 1 September 2011 will be entered in the prize draw to win the necklace.

The gold plated honey bee on a silver flower designed especially for the BBKA.

What do you get if you Adopt?

Members of the public make a donation of £29.50 and receive a welcome pack, with a newsletter called Hive Talk and an update on their adopted hive very quarter.



The welcome pack for Adopt a Beehive supporters

Help Adopt a Beehive go from strength to strength

When you are next approached by people interested in helping bees, do introduce them to Adopt. There is information on the website about the different conditions and challenges faced by beekeepers across the country, and supporters can opt to adopt their beehive in a specific geographical region that they feel particularly drawn to. The website address is www.adoptabeehive.co.uk. This is an excellent way for non-beekeepers to support bees and beekeeping. The funds raised contribute to research projects into honey bee health and habitats or promote education and training for beekeepers to ensure best husbandry practice — all worthy causes — so please, bee part of it.

Honey Bee Anatomy

This is the first article of a new series on honey bee anatomy written by Graham Royle. In this article Graham describes the fascinating primary sense organs — the antennae and the eyes.

As every beekeeper knows, the world of the honey bee is fascinating. We tend to treat each colony as a 'super-organism', managing it as though it were a single entity, whereas of course it is made up of many thousands of individual members who work together for the benefit of the whole.

Taking time out to study the anatomy of an individual bee can be very rewarding. Whether it be flight, foraging, feeding or defence, the anatomy of the honey bee has evolved to perform such tasks efficiently and effectively. A simple hand lens can be used to study the external anatomy of a bee, although a dissection microscope providing magnification in the range $\times 10$ to $\times 30$ is a better tool to use. Also a dissection microscope is essential if you want to study the internal anatomy of the bee.



Figure 1. Honey bee head showing antennae and eyes. Photo: Graham Royle.

Antennae

The head (Figure 1) carries the primary organs of sense — the antennae and the eyes. While there are sense receptors distributed over the bee's body, the vast majority are located on the bee's antennae. An antenna consists of three parts: the scape, pedicel and flagellum. The flagellum is divided into ten segments in the worker and queen, and eleven in the drone. The pedicel contains the 'organ of Johnston', a collection of sense cells, which are believed to detect vibrations of the antenna and may act as a flight speed indicator¹. The flagellum, particularly towards the tip, is covered with thousands of sense organs, or sensilla, of several different kinds. These provide the bee with its sense of touch and smell. Some of the receptors also allow the bee to measure temperature, carbon dioxide levels and humidity. Among the sense organs are plate organs, which provide the bee with its sense of smell. There are around 2,700 plate organs on each antenna of a worker and 1,600 on the antenna of the queen. In contrast, the antenna of the drone is covered with approximately 15,000 providing the drone with a far more sensitive sense of smell². This adaptation assists the drone to find a queen on her mating flight.

The honey bee has to keep its antenna clean so that the sense receptors can work efficiently. On each of its forelegs it has evolved a built-in antenna cleaner illustrated in figure 2. This takes the form of a circular notch in the basitarsus and a separate fibula attached to the tibia. To use the antenna cleaner, the bee brings its leg forward, engages the antenna into the notch and then flexes the joint to bring the fibula



Figure 2. Close up of the left foreleg 'antenna cleaning' apparatus: A notch () in the proximal basitarsus (B) bearing bristles, overlaps with a small projection called a fibula (F) attached to the distal end of the tarsus (T) when the leg is bent, so forming a semi-circular groove through which the antenna is pulled for cleaning. Photo: Graham Royle.*

across the notch to encircle the antenna. The leg is then drawn along the antenna and the hairs lining the notch brush the antenna clean of dust and pollen grains.

Eyes

Unlike our eyes, bees have compound eyes made up of a collection of separate light sensors known as ommatidia. There are approximately 6,900 making up each of the worker's compound eyes. The drone has larger eyes, each with approx 8,600 ommatidia¹. The individual ommatidia comprising the drone's eyes are also of a larger diameter than those of the worker, which explains the significantly larger size of the eye. This additional visual acuity is, once again, an adaptation to help the drone see the queen when on a mating flight.

Each ommatidium consists of a lens, which funnels light to a long transparent rod, the rhabdom. This is surrounded by eight retinal cells, which detect the light and

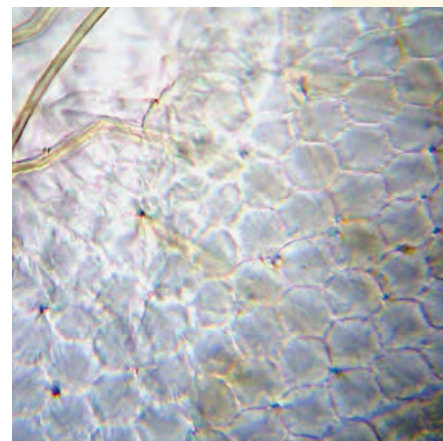


Figure 3. Corneal surface of a compound eye of a honey bee, showing the separate hexagonal lenses, each covering the light sensitive visual cells of each ommatidium. Photo: Graham Royle.

pass information to the bee's brain. It is the design of this structure that enables the bee to detect polarised light — an essential aid to the bee's ability to navigate.

A view of the cornea of the compound eye is shown in figure 3. The many separate hexagonal lenses, each of which covers a separate ommatidium, can be seen.

Being made up of many separate sensors, bee's eyes do not form an image in the same way as our eyes do. Each ommatidium detects the intensity of light in the field of view in front of it. As the compound eye has a curved surface, each ommatidium points in a slightly different direction and thus each one gathers light from a different direction. It is thus likely that a bee sees a pixellated view of the scene in front of it with limited sharpness.

In addition to having pixellated vision, bees do not perceive colours in the same way as we do. Karl von Frisch³ demonstrated through experiment that bees are red blind. They are unable to differentiate between red and either black or dark gray. The image below (Figure 4) shows how a bee may see an object as it approaches it. (Each pixel would probably be hexagonal, however, not square). The right hand picture is what we humans would see of the same field.

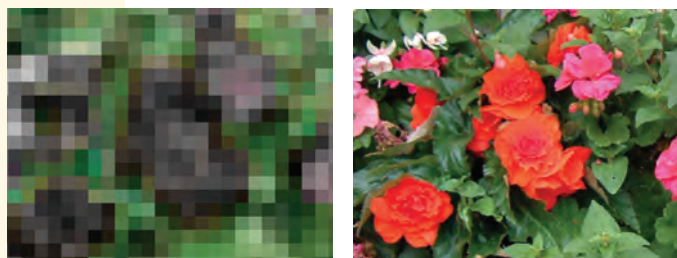


Figure 4. The image above left is what a 'bees-eye' view might be of the image above right, which would be that seen with the human eye. Photos: Graham Royle.

The bee has an additional three simple eyes on the top of its head called the ocelli (Figure 5). These have a very simple structure and cannot form an image. They are simple light sensors with a purpose



Figure 5. Honey bee head seen from the top, showing three small ocelli indicated by arrows. Photo: Graham Royle.

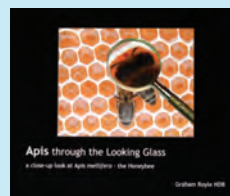
which is unclear. Experiments have shown⁴ that their function is to measure light levels and they may act like photocells to enable or 'switch on' the large compound eyes when the bee emerges from within the darkness of the nest.

Graham Royle, NDB

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'Swarm Calls' that Turn Out to be Bumblebees

Have you had a phone call — from someone with no bee knowledge, but a bee problem? They are out of their depth, their safety is challenged ... but they are also intrigued. You are a beekeeper; your role is to understand their situation, give advice and perhaps practical help. Your questions lead to understanding, then discussion and advice. By helping, you interact with people and get great satisfaction. Your association enhances its reputation, its public profile and perhaps even gains a donation.

When is a bee a bumblebee?

Beekeepers get 'help calls' about many types of insect. It starts in spring with calls about solitary bees, moves on via bumblebees to honey bee swarms, then wasps — from August until the frosts. So, how will you know this call concerns bumblebees?

It helps greatly if the caller can email you a photograph, but time of year is the first pointer; bumblebee calls are usually from April to June. Other inputs are the colours, shape, furriness, sound and behaviour of the bees. The nature and amount (numbers/frequency) of flight activity is important and where this happens. With bumblebees, expect only a few in/out flights per ten minutes, often less; dramatically less than honey bees. The exception is *Bombus hypnorum*, the tree bumblebee, fairly new in the UK, where it is common for a little cloud of drone bees to fly around close to the nest all day, for days on end. They will be the subject of an article in June BBKA News.

Bumblebee queens are about from early spring. Once ready they 'nest search' for somewhere snug to use as home; often an old mouse nest. Colonies start with just the queen, but only a few queens will be successful and start a nest. It can be two months before there is enough flight activity for people to notice anything. Bumblebees are enterprising creatures. The activity might be at a hole in the ground, or in a compost heap where they wriggle under surface material, in or under a shed, in a bird-box, up at house roof level or in an air-brick. They can also land, then walk to a nest in a shed or garage.

Although often similar, there are major differences between bumblebees and honey bees. Colony numbers vary with the species, but by summer and with a prolific species, there will only be 400 bumblebees ... tiny numbers compared to honey bees! Colonies die out after three to six months. Queens can sometimes choose to re-use a 'nest area' in later seasons, but there is little knowledge about this behaviour. Within a colony bumblebees vary significantly in size, and can also vary in colour pattern. You can find out much more about this at the Bumblebee Conservation Trust's (BBCT) website: www.bumblebeeconservation.org

Solutions for SOS calls

Assuming your caller's situation is caused by bumblebees — what do you do? Firstly, sound envious; try to persuade them to let the bees stay put and to enjoy their new role as landlord. Say something like: 'You are so lucky! Do enjoy watching them come and go!'

In almost all cases there should be no need to interfere with a bumblebee colony. My exceptions to this would be:

- When small children could be at risk.
- To resolve a domestic crisis.
- To save the colony from construction work.
- A *B. hypnorum* colony in a bird box fixed on a surface liable to vibration (e.g. sheds). The vibration upsets the bumblebees and can cause them to sting people. A colony in a box not subject to vibration should be no trouble.

In general bumblebees are significantly less defensive than honey bees, but if you start trying to interfere with a nest expect a hostile reception. Their stings are unbarred so you get a smaller dose of venom, but otherwise it is like a bee sting. Bees lying on their backs with their legs in air, are waiting to grab then sting you!

How to move a bumblebee colony safely

If it is necessary to move a colony, do this gently at night. Work with red light from a rear cycle light, or put some red plastic film over a torch. Bumblebees cannot see red, so will be unable to fly or evade gentle capture if the intensity of the light is not too bright. Bees that do not come with the nest can be captured individually in small pots, like a 35mm film tub, then tipped into the box. You need to work quickly!

The ideal for the bees would be to find a shoe box or something similar. Put dry grass or dry moss in the bottom of the box to support the nest. Make a 2cm hole in the end and block it with tape, or some kind of bung. Wearing your bee gear and gloves, pick up the nest and pop it in the box. Collect and add any lost bees, top up with extra moss, then shut the lid tightly; they can get out of tiny gaps! Try to keep the nest upright, otherwise their honey pots will spill. Take the nest about two miles away and put it somewhere sheltered, out of direct sunlight and with a board or something rainproof over the top. The two miles is to prevent foraging bees getting confused and returning to the original nest site. Once you have moved them and the bees

have settled down, remove the tape/bung. The bees might take a little while to adjust, but should take to their new home. Expect a few bees back at the original location; these will be ones you missed or foragers that camped out overnight, only to find their colony gone the following morning. An alternative approach, for bees nesting in, or close to the ground is to re-position their flight entrance using a tube put into a more suitable position, but do remember to do this at night.

You can find further details on moving colonies in the 'About BBCT' 'Contact us' section of the BBCT website. Re-homed colonies are an excellent educational tool: see my article in BBKA News 169 February 2008.



Clive Hill, High Wycombe BKA
clive_hill@talktalk.net



A queen Tree Bumblebee, *Bombus hypnorum*, feeds on nectar from a female Pussy Willow catkin. Photo: Clive Hill.

What Might Be Causing Colony Collapse Disorder?

In the April issue of BBKA News Professor Jamie Ellis examined the data on loss rates of managed honey bee colonies in the United States (US) and considered how this could impact upon the sustainability of beekeeping in the US. In the second of his articles Professor Ellis searches for potential reasons for colony losses — with the common-sense approach that identifying and minimising honey bee stressors will inevitably help promote bee health and ultimately contribute to the sustainability of beekeeping.

In answer to the question: 'What might be causing Colony Collapse Disorder (CCD)' I realise that saying 'many things kill bees' is an ambiguous and unfulfilling answer despite being a truthful one. There are many factors that can affect the overall health of a colony, which could contribute to colony losses. With that in mind, I will discuss, briefly, colony stressors, which are receiving considerable attention from researchers. I fear that there is an inherent danger with presenting the information this way. One risks compartmentalising stressors as if they act alone to kill a colony. I think it is important to remember that honey bees do not live in a vacuum. They travel out into the world and interact with other things/with their environment and so on, in ways that we do not understand fully. With that said, one must remember that most colonies do not face a single stressor, but rather multiple stressors that interact in undiscovered ways. Also important for you to remember is that my discussion here of the stressors does not preclude the existence of others. As I shared with you the last time I published a similar list in this newsletter: 'The cause of CCD is under investigation. At this point, almost every conceivable and realistic cause remains a possibility. Some leading candidates and a brief explanation of their potential role are listed below. This is not an exhaustive list and the candidates occur in no particular order. It is important to note that this list may change as new information on CCD becomes available. Such changes could result in the addition or exclusion of any of the following potential causes.' How is that for a disclaimer?

Examining potential stressors in CCD

Traditional bee pests and diseases

This includes American foul brood, European foul brood, chalk brood, noseema, small hive beetles and tracheal mites. Many 'traditional' bee pests and diseases have been ruled out as contributing significantly to CCD. For example, tracheal mites, chalk brood, the foul broods, small hive beetles, etc. are probably not the primary cause of CCD. Rather, they are probably secondary stressors that can lead to colony demise if the conditions are right.

How the bees were managed

In my travels, I often hear beekeepers outside of the US blame CCD on how bees in the US are managed. Admittedly, many bee colonies (probably >60%) in the US are moved around the country to pollinate various crops. Some suggest that this is killing bees. That said, I am aware of data coming from migratory colony studies that suggest stationary colonies are no more likely to die from CCD than are migratory colonies. Furthermore, I do not subscribe to the claim that CCD is a commercial beekeeper problem. I regularly hear from hobbyist beekeepers who report CCD-like symptoms in their colonies.

Queen source

Honey bees are not native to the US. Consequently, we have a fairly

limited amount of genetic diversity in our honey bee populations. Though not likely to be a primary stressor affecting colony health, queen source (or genetic biodiversity) possibly could predispose some colonies to certain problems.

Chemical use in bee colonies

As you know, beekeepers use a handful of chemicals in colonies to control various bee maladies. Some suggest that these chemicals could compromise bee health in ways that we do not understand fully. I agree wholeheartedly and certainly support research into less chemically-dependent means of controlling bee problems. For what it is worth, fluralinate and coumaphos are the two insecticides most found in US honey bee colonies (both in terms of the number of times found and the amount found in colonies); both are products used in US in bee colonies for the control of varroa.

Chemical toxins in the environment

A honey bee colony can forage a 3–5 mile (5–8 km) radius in every direction from its hive. Consequently, a single colony forages 28–79 m² (79–201 km²) around their colony. That is a tremendous amount of area that a single colony covers! Some scientists have found a number of pesticides in honey bee colonies, including herbicides, fungicides, and insecticides all brought in from the environment. I spend a lot of time looking at pesticide effects on honey bee health. Certainly, bee exposure to pesticides is a real problem, and possibly even a primary stressor. However, I do not think it is safe at this point for beekeepers to blame losses solely on pesticides.

Genetically modified crops

Even two years after discussing genetically modified organisms (GMOs) in an earlier BBKA News article I wrote, we still know little about the impacts of GMOs on bees. I suspect that there is little effect from the genetic modification of the plant. However, many GMO plants are grown from seeds that are dipped in systemic insecticides. Some feel that this is the possible contribution of GMOs to bee deaths. We need more data to know for sure.

Varroa mites and associated pathogens

Interestingly, even with the concerns surrounding CCD, varroa mites remain the world's most destructive honey bee killer. As such, many continue to study varroa as a primary stressor. Additionally, varroa can transmit viruses to bees. I remain optimistic that novel varroa controls are on the horizon. Until then, the contributions of varroa to colony losses are real and significant.



Varroa photos Courtesy of The National Bee Unit at The Food and Environment Research Agency (Fera), © Crown copyright 2010.



Figure 1: A honey bee colony located between watermelon (foreground) and sunflower (background) fields. Bee nutrition is an important part of the overall health of a colony. Where are your colonies foraging and what are they being exposed to while out of the hive? Photo: Amanda M. Ellis.

Nutritional fitness

This remains a topic of considerable investigation (Figure 1). Unfortunately, we still know little about everything bees require nutritionally. That said, many believe there is a clear connection between bee nutrition and a bee's ability to fight off diseases or other stressors. This is certainly the case for humans.

Undiscovered new pests and diseases

This may seem like an ambiguous category but it has been the most promising one to date. For example, Israeli Acute Paralysis Virus (IAPV) and *Nosema ceranae* are two pathogens that have been discovered in recent years and are known to affect bees negatively. In fact, several authors have suggested that *N. ceranae*/virus combinations are correlated strongly with CCD. Regularly in the literature, virus/*Nosema* joint infections are discussed as possible causes of CCD. Though promising findings are advertised in this arena often, this is an area of research that must continue to grow. Significant advancements have been made in virus and *Nosema* control, particularly in the area of RNAi technology. This is an important area of ongoing research.

Of course, along with any list of major colony stressors comes the reality that it is impossible to discuss, in a limited space, all of the stressors that can kill a honey bee colony. I list above those stressors that are receiving considerable attention from the scientific community. Whenever one discusses possible causes of CCD, he/she runs the risk of omitting or overlooking stressors that others feel are responsible. To that end, I apologise if I have failed to include your pet hypothesis. Though I do not believe that mobile phones, power lines, or solar storms are affecting bee colonies, other theories remain interesting to me. The difficulty of being a bee scientist is that everyone has a theory for the loss of bee colonies, and everyone wants you to test their theory.

Some final thoughts

As I conclude this article, I hope to convey to you the difficulty of determining a cause, 'the' cause, of CCD (or colony losses in general). Quite frankly, I think that there is compelling reason to believe that synergisms between stressors are more problematic for a colony than any one stressor. There seems to be a growing body of evidence to support this assertion. Regardless, I think it benefits everyone involved with this issue to look at the data critically and approach these losses reasonably. We must be careful not to follow the latest theory (or a pet one for that matter) too closely. Science evolves, as does our level of understanding. Hold your theories loosely.

Honey bees in the US are under considerable stress. Regardless of the cause of that stress it is important to take steps to help bees and increase the sustainability of beekeeping. My hope is that you will work hard to minimise stress in your colonies. Stay educated and engaged. I am optimistic that honey bees will survive this latest threat. They have survived other, equally devastating, stressors over their many years of existence.

One final piece of advice is warranted. Do not let the news of CCD (and the existence of other colony maladies) take the joy out of beekeeping for you. Sometimes I feel that we dwell so much on the negative that we fail to remember that bees and beekeeping are truly amazing. Happy Beekeeping.

Jamie Ellis, PhD

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Managing Bees to Maximise Honey Production

All beekeepers like to see their bees healthy and producing lots of lovely honey. But some years we all seem to struggle with getting a good honey crop. The National Bee Unit achieve good success with honey production and they share their secrets with us in this article.

At the National Bee Unit (NBU) we keep 150 colonies in apiaries in and around the Food and Environment Research Agency (Fera) site at Sand Hutton, North Yorkshire. Although our bees are primarily kept for research and training projects they also produce a large honey crop. We harvest between four and five tonnes annually. Typically, each hive produces 40kg, but in 2009, which was a good year, our best performing colony made 120kg and the highest yielding apiary an average of 73kg. There are five golden rules that we stick to, which we believe help us achieve high yields:

- Thorough preparation and planning.
- Good bee stock.
- Careful monitoring.
- Swarm control.
- Correct apiary location.

Preparation

Our top motto is 'be prepared'. Whether you have one colony or one hundred, the better organised you are, the better your chances of achieving maximum yield. Skilled beekeeping and good bee stock are the foundations of successful productivity. Plan your beekeeping year in advance. Get the right equipment. Use the quieter periods such as the winter to get everything ready for the next season. If you are new to beekeeping, start by getting some training and as much advice as possible from experienced beekeepers.

Bee stock

A good honey crop begins with a good queen. We use UK-sourced bees from UK breeders, import some from Europe and also breed queens from our colonies that have been selected for desirable traits. When choosing queens for maximum honey production, it is equally important to consider traits like apparent disease resistance, temperament and swarming tendencies. Strong healthy colonies are more productive. Assessments of colony size and condition provide vital bases for husbandry decisions; choose bees that are docile and easy to handle. We find that younger queens are less prone to swarming and fewer young queens are lost over winter. We requeen our colonies every two years. Keeping thorough apiary and colony records is essential, so that whenever you visit a colony you either already know its history or can easily look up the details.

Monitoring

Bees are particularly vulnerable to starvation when coming out of winter and into the spring; many colonies survive winter but die during March. Colonies that have been stressed by starvation in the spring are smaller, more prone to diseases and infestations, and as a result are much less productive. Throughout the winter NBU colonies are checked for stores and topped up with feed (e.g. Ambrosia, sugar syrup) when necessary. Varroa infestation causes significant colony stress and can lead to collapse. If winter treatment is not carried out and mite populations are allowed to 'tick over' when the bees are clustering, the numbers of mites will increase extremely rapidly as soon as the brood area expands in the colony early in the year. This has a big impact on bees' immune systems and thus their productivity. Rigorous varroa management, not just before the season but throughout the year,



Hives with supers at the National Bee Unit apiary. Courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; images supplied by the National Bee Unit at Fera.

underpins productive healthy colonies and therefore the potential for a good honey crop. In January we treat for varroa using oxalic acid, bought in pre-mixed sugar solution at 4.5%. We trickle 5ml of oxalic acid/sugar solution onto every full seam of bees between the combs, thus ensuring any mites attached to adult bees are knocked down when colonies are broodless.

The spring inspection is particularly important as it enables us to make vital husbandry decisions before any honey flows. Spring checks include clearing out any dead bees and debris from the floors and removing any old dark combs and replacing them with fresh foundation. Dead colonies are immediately sealed, checked for the reason that they succumbed and cleared out so that the remaining healthy colonies will not be allowed to rob out stores from the dead colonies, and pick up hidden pests and diseases and spread them throughout the apiary. At this time our colonies are also inspected for foul brood. Although these specific apiary visits checking for disease are scheduled at least twice each year, we always keep an eye out for any signs of foul brood. In this way, we ensure that colonies are as healthy and disease free as possible, minimising the possibility of stresses on the bees that will impact on their productivity during the coming season.

Swarm control

If bees are allowed to freely swarm, the colony will be unable to produce high yield. We visit each colony every eight to ten days, adding supers for space where needed. The trick is to make sure that the bees always have enough room well in advance of any congestion of the nest. Bear in mind that when you remove full supers from a colony, bees will quickly run out of space, triggering swarming behaviour. It is therefore really important to have enough boxes and frames with foundation ready to put onto the colonies. If you are thinking of just starting out as a beekeeper, or increasing the size of your apiary, the logistics of rapid turn around of your the boxes during a honey flow, and storage space for sufficient spare supers have to be considered.

Location

Finally, remember the estate agents' saying: 'location, location, location'. Our most productive apiaries are those which are set up where the bees have access to the right kinds of varied forage. To get the best honey yields, bees need season-long access to a succession of different flowers. It is a good idea to find out which crops and wild flowers are in your beekeeping area and to learn their flowering cycles. Early in the year, on the warmer days, we can see the NBU bees foraging for pollen on hazel and willow. Depending on the weather, this can be as early as February through to March (first pollen-gatherer this year was seen on 5 January 2011). By April the bees are foraging on dandelion. There is plenty of blackthorn, while May brings the hawthorn flowers into the hedgerows. The majority of our honey crop, however, comes from locally abundant oil seed rape (OSR), which first flowers as early as



Oil seed rape field — a good source of forage for bees. Courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; images supplied by the National Bee Unit at Fera.



Honey bee foraging on willow. Courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; images supplied by the National Bee Unit at Fera.

April/May, and continues throughout most if not all of June. Through the summer months a bean crop is occasionally grown on some nearby farms, providing forage for the bees even after OSR has finished. Our bees are also able to use many wild flowers from the surrounding villages and woodlands. A small proportion of our honey comes from clover and lime, flowering from July to August, while some of our apiaries benefit from the invasive introduced species Himalayan balsam (August/September). After we have removed and extracted the bulk of the season's honey, the bees can still be seen foraging on ivy flowering well into October.

Further information

For guidelines on varroa treatments, importing queens and general advice on bee health, please visit the BeeBase website at: www.nationalbeeunit.com where you can also register as a beekeeper.

Benjamin Jones, Laboratory Manager,
Jack Wilford, Laboratory and Apiary Technician
Damian Cierniak, Principal Apiarist, NBU

Pheromones — Part 6

This time I thought we could discuss a primer pheromone. Primer pheromones change the physiology of the bees rather than inducing an action; they are normally less volatile than other pheromones and might need to be absorbed into the body to work.

It is commonly known that in a honey bee colony there is a balance between the number of workers that forage and the number that look after the nest (known as house bees). But how is this balance maintained? If we do an artificial swarm using techniques where the flying bees are split from the house bees, such as Pagden and Snelgrove (see page 7), then we encourage the adult (foraging bees) to remain with the queen and the house bees to remain with the brood thus creating two unbalanced colonies. In these circumstances the colonies seem to balance themselves out pretty quickly and soon both have house bees and foragers in the right proportion.

Gene Robinson, in 1992, looked at this phenomenon and found that it seemed to relate to a hormone that differentiates a queen from a worker, known as juvenile hormone. He noted that older workers had high levels of juvenile hormone in their bodies whereas young workers had low levels. When he removed the older workers from the

colony he found the level of juvenile hormone in the young workers increased rapidly and they then started to exhibit traits associated with older, foraging workers. It is clear that there is a control on the aging of house bees by the foragers, but it is never as simple as just one control element. The process also is moderated by the presence of brood that requires feeding and the presence of the queen. Having looked at the literature I have been unable to identify the precise pheromone that exercises the control on the young house bees but it is clear that the older foragers are influencing development of the young ones.

This explains why, whatever the total size of a colony, it is able to adapt to the amount of forage available at any time of the year and ensure there are always sufficient foragers to collect nectar and pollen and sufficient house bees to use the income to care for and develop the brood. The only time this process does not seem to fit is in winter when there is no forage. In this case the balance is not required and, in extreme weather there will be neither forage nor brood to care for.

Ivor Davis, NDB

The Random Apiary Survey — An Update from the NBU

The Background of the Random Apiary Survey

The National Bee Unit (NBU) already closely monitors the incidence of notifiable diseases such as European foulbrood (EFB) and American foulbrood (AFB) through its longstanding annual inspection programme. However, NBU inspectors routinely visit apiaries that have a higher risk of having these notifiable brood diseases. As a result, our idea of how common AFB and EFB are across England and Wales could be inaccurate if we use inspections data, which concentrate their efforts in areas of disease. There is also a need to establish a much clearer picture of the prevalence and distribution of a wider range of pathogens, pests and diseases that may be affecting our bees. Only when we have these data can we make informed decisions on the future priorities for action to improve bee health in each region. For these reasons the NBU has been carrying out a two-year survey to achieve a random, statistically robust analysis of apiary health in England and Wales, as part of the Healthy Bees Plan. The survey began in June 2009 and is due to run until the end of May 2011. The results of this Random Apiary Survey will provide evidence as a basis for refining statutory inspections and surveillance programmes from 2012 onwards.

How the Random Apiary Survey works

The survey has been designed to detect the presence of pathogens, pests and diseases in a representative sample of apiaries. The number of apiaries that need to be in the survey to make sure that it is sufficiently thorough for our purposes has been agreed with statisticians, and will allow the detection of even very low prevalence of pathogens, pests and diseases with a very high level of confidence. Throughout the course of the survey, apiaries have been and will continue to be selected on a random basis from BeeBase, 'stratified', to ensure adequate regional coverage and to take account of apiary size. Randomness is important to the survey, but so is timing because many pathogens, pests and diseases are seasonal, their prevalence and concentration fluctuating from month to month. We aim to sample a total of 4,600 apiaries over the two-year lifespan of the Survey. Over twenty thousand samples of bees will be collected and analysed at Fera, for a full range of pests (Tracheal mite (*Acarapis woodi*), *Varroa* mite); the bacteria which cause AFB (*Paenibacillus larvae*) and EFB (*Melissococcus plutonius*); fungi which cause chalkbrood (*Ascosphaera apis*) and Nosemosis (*Nosema apis* and *Nosema ceranae*); and viruses (Deformed wing virus, Sacbrood virus, Chronic bee paralysis virus, Slow paralysis virus, Black queen cell virus) including those implicated in CCD (Israeli acute paralysis virus and Kashmir bee virus) and overwinter losses in Germany (Acute bee paralysis virus). A survey of this magnitude and complexity has not been attempted anywhere else in the world so sampling, handling, testing and data handling will be challenging. However, Fera hopes to publish the full results upon completion of the analysis in Autumn 2011.

What happens if your apiary is selected for sampling?

If one of your apiaries has been selected for the Random Apiary Survey, then you will receive a phone call or a letter from your local NBU inspector to arrange a convenient inspection date. In addition to a normal inspection we would like to collect a sample of about sixty adult bees from each of your hives in the chosen apiary, up to a maximum of five colonies. These bees will be sent to Fera in York, where they will be screened for mites, viruses, fungi and bacteria.

Interim findings of the Random Apiary Survey

Data collection and statistical analyses for the Random Apiary Survey are not yet completed, but we can give you some indications of our findings from the first year:

- So far NBU inspectors have sampled 3,978 apiaries across England and Wales and all bee samples have had their genetic material prepared for testing. Many tests have already been completed for some of the pathogens and these data await quality control processes. Results are being released to participating beekeepers who can view their results by logging into their secure area of BeeBase.
- The NBU's existing annual inspection programme detected significantly more AFB and EFB than the Random Apiary Survey did over the same time period, indicating that risk-based inspections are pretty efficient at finding disease.
- As a result, the prevalence of AFB (24 cases in 10,000 colonies sampled) and EFB (112 cases in 10,000 colonies sampled) in the honey bee population across England and Wales appear lower than previously calculated using normal inspections data.
- Both *Nosema apis* and *Nosema ceranae* are widely distributed across England and Wales and were detected at half the apiary locations sampled during the first year.

A message to participating beekeepers

If your apiary has already been sampled as part of the Random Apiary Survey, then on behalf of the beekeeping community the NBU would like to thank you for your valuable contribution. Collective results will be available and published on BeeBase later this year, but your individual colonies will not be identifiable. However, you will have access to your own results by visiting the BeeBase database online. This is a unique opportunity for you to see what hidden pathogens might be affecting your bees, as well as providing a valuable contribution to our understanding of honey bee health in general. However, it is important to understand that some context of the results is lost when viewed at the individual apiary level. The most valuable result to participating beekeepers comes with the overarching findings from the entire study.

Gay Marris, Ben Jones and Giles Budge,
National Bee Unit
The Food and Environment Research Agency

Further Reading

Cox Foster *et al.* A metagenomic survey of microbes in honey bee colony collapse disorder. *Science* 2007; **318**: 283–287.
Higes *et al.* How natural infection by *Nosema ceranae* causes honey bee colony collapse. *Environmental Microbiology* 2008; **10**: 2659–2669.
Siede *et al.* A real-time PCR based survey on acute bee paralysis virus in German bee colonies. *Apidologie* 2008; **39**: 650–661.

You can read more about the Random Apiary Survey and other NBU projects at the BeeBase website www.nationalbeeunit.com

New BBKA Website Information

The BBKA Website Group can report that development of the new BBKA website is progressing well and by the time you read this article we expect it either to have been launched or to be about to be launched. As you should be aware the plan is to replace BBKA website after the Spring Convention and we will give one week notice on the existing website before the change-over takes place, however.

This is the first official information to be circulated to members. We will provide more information both through BBKA News and your Associations, and we welcome your constructive comments. The objective of the BBKA — and what we intend to provide — is better website facilities for members.

Internet and non-internet members

While the website is, by implication, mainly available to members who have access to the Internet, this does not preclude any non-PC users from accessing it or from being included on the website 'swarm catchers' facility.

Access to members' area

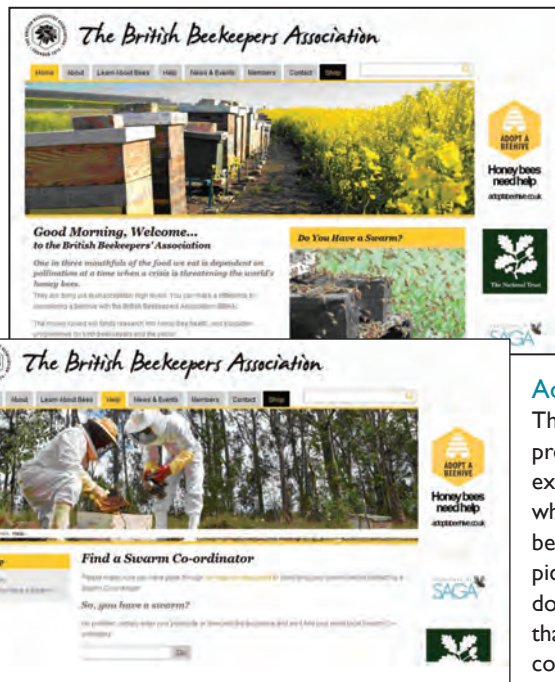
When the new website is launched the existing members' user name and password published in the BBKA News will cease to be valid. Instead all members will have their own (private) user name and password. Facilities are being provided within the new website to enable this to happen and members will need to log in using the information contained on their BBKA membership card.

Swarms and 'swarm catchers'

One major problem identified by Associations and the BBKA Office is that of the general public not knowing what to do if they suspect they have a swarm in their property. The new website will include information to help identify honey bees, bumblebees and wasps, and there will be some advice as to what the public can do about them. The existing website 'swarm catchers' list will be replaced with a facility to enable website visitors find and contact someone who can assist them in their specific geographic (postcode) area, as a service to the community.

Because persons being put forward as swarm collectors on the BBKA website are effectively recommended by the BBKA/Associations they will need to satisfy certain criteria. These are that they must be BBKA/Associations members, and that their

Association must verify they are suitable and appropriately qualified to undertake that task, and it must submit their details to the BBKA.



As a secondary measure, we hope that each Association will provide us with the contact details of their Swarm Coordinators so that a system can be developed to provide enquirers with two sets of information i.e. the local swarm collector and the Coordinator, just in case the initial local contacts are not available. To achieve this, we will need the relevant information about all members who are prepared to assist with swarms. To ensure the privacy of members' information the only information that will be provided to the public will be the names and telephone numbers of the Association-identified swarm collectors who are geographically closest to the swarm, i.e. within a ten-mile radius of the enquirer's postcode. No addresses will be published and all information held is covered by the BBKA policy for information use. Requests have been made to all Association Secretaries via the BBKA General Secretary for your swarm collectors' information. This should ensure they are represented on the new site at the earliest opportunity; future amendments (additions, deletions and changes) to the list can be made to the swarm-collectors list via official contact with the BBKA office from your Association Officer/General Secretary and the list will need to be maintained to ensure its accuracy.

BBKA forums

This facility, located within the BBKA Members' Area of the website, enables members to ask questions or seek information. Previously,

access to the forums required members to separately register as a forum member, but this will be changed and simplified on the new website as there will be only one login required to the members' area. This area will be accessible to website visitors, but visitors will be restricted to read-only facilities in the forum area only. They will not have access to any other part of the members' area, and they will not be able to post questions onto the forum. Should a visitor to the website wish to ask a question, those can be submitted to the BBKA using another facility on the website.

Additional website facilities

The website will continue to be developed to provide more information. One immediate example of this is the provision of an area where members can upload/store appropriate beekeeping and beekeeping-associated pictures, which could be made available for downloading and copyright-free use, providing that suitable acknowledgement is given to the copyright owner (usually the photographer).

Privacy and protection of members' data

This subject is very important to the BBKA and to all of us as individuals. It is recognised that some members are reluctant to provide their email or contact information to the BBKA, but for the swarm catchers service to work, we do need full contact details. One of the benefits of having full contact information is that urgent communications could be made speedily and directly to members. All information made available to the BBKA is covered by the BBKA's Data Protection Registration under the Data Protection Act and members' information will only be used as specified and agreed in the BBKA information policy. This is secure and no information will be disclosed to any unauthorised person or organisation, and we hope that all members will assist us by providing their full information.

Association website hosting

Some member Associations host (as separate entities) their websites on the BBKA website. This will not change; all existing local Association websites will be transferred to the new website.

We hope that you enjoy the new website, which represents a significant amount of work by the BBKA, but do not hesitate to contact me via the BBKA Office.

David Teasdale,
Chairman of BBKA Website Working Group,
North Staffs BKA

Caveat emptor — let the beekeeper beware

There are many new beekeepers joining our ranks, all eager to start beekeeping and that, like the cost of crude oil, has led to a leap in the price of colonies of bees and Queens. May I offer a few words of caution? Do get advice, and preferably some experience, before you start. Beekeeping is a hands-on craft and your local beekeeping Association is usually the place to learn and see whether beekeeping is for you or not. Do use it and for preference, buy your bees locally from — or with the advice of — the local experts.

The internet is a great new disseminator of information and companies can produce sales literature of bees, queens and products that sound marvellous, but they do not mention the down side. You can make mistakes without sound advice. The National Bee Unit (NBU) has prepared a Best Practice leaflet called 'Advice for Obtaining Honey Bees', which is available for downloading on their website at <https://secure.fera.defra.gov.uk/beebase/index.cfm?pageid=167>

“Your purchase could be seized at the point of entry and destroyed if it is illegal.”

What can happen?

The beekeeper reads an advert in a journal or on the internet, places his or her order and the goods arrive. Legislation is complex and not every supplier or purchaser researches the situation, each relying on the other to be informed.

Your purchase could be seized at the point of entry and destroyed if it is illegal. You may not have bought what you thought you were buying. Are the bees in the nucleus the offspring of the queen or have they just been united at the point of sale?

Parcels do get through that do not comply with regulations

Varroa has been the most serious import into the UK in the last 20 years. Laws have their place but informed common sense is perhaps the most potent protection we have. It surprises me that some beekeepers do not seem to relate their current action to past events and attempt to learn from them. Pests can be present in an area before they are found, so don't be the first one to import them.

Potential problems

What are the potential problems that we could import?

- ❑ *Aethina tumida* the small hive beetle, is a major pest which originates from South Africa. It has become established in Australia and the USA. It infests colonies and honey houses and causes heavy colony losses also spoiling honey in stored supers.
- ❑ *Tropilaelaps clareae* — *Tropilaelaps* sp. is another damaging mite, endemic in Asia. It is said to die within a few days in the absence of brood. However, when I worked in Pakistan, we could find it in colonies long after brood production stopped, as it does in the hot season.
- ❑ *Apis mellifera capensis* — the cape honey bee. This bee, which is normally confined to the South African cape, was moved by beekeepers into the Transvaal causing heavy losses there because of its propensity for producing laying workers.
- ❑ **Africanised honey bees** — these very aggressive bees proved to be dominant throughout South America and have migrated into the Southern United States, particularly Texas, Arizona and California.
- ❑ **American and European foul brood** — strains of the causative pathogens, which are resistant to oxytetracycline, have been found

in Argentina and many US States. Illegal uncontrolled use of antibiotics can select for these strains. Their regular use can also suppress the signs of disease for a period. Nuclei and packages from sources that regularly use antibiotics can thus develop signs of disease after being apparently healthy at point of sale. We have moved away from the use of antibiotics in the UK and have better disease control than many other countries.

- ❑ **Imported honey** can carry enough pathogens to cause disease in colonies fed or robbing imported honey.

❑ **Unsuitable strains of bees.** We have a very variable climate, very different from continental regions where most bee breeders operate. I am a great believer in networking

with local beekeepers. The recent developments in breeding bees locally to be resistant to varroa, yet productive, are ones I heartily endorse.

I could go on, but I hope I've made my point.

Legislation

The Bee Diseases and Pests Control Orders define the importation requirements for honey bees and bumblebees. In a brief note I cannot cover all complexities. Any beekeeper in England and Wales intending to import or export should ask for information from the Fera National Bee Unit (NBU) at York. It is a mine of information and can be accessed at <https://secure.fera.defra.gov.uk/beebase/index.cfm?sectionid=47>. In Scotland, information can be obtained from Science and Advice for Scottish Agriculture and in Northern Ireland, the Department of Agriculture and Rural Development.

Health certificates

Import or export of bees (including queens, packages and colonies) is permitted if accompanied by an Official European Union (EU) or Third Country health certificate issued by the competent authority of the country of origin of the bees via TRACES, which the NBU uses to track imports and exports.

The TRACES system is a risk-management tool for animal health and public health, relating to trade in animals and products of animal origin whether within the EU Community or originating in Third countries. It also provides the veterinary authorities of the Member States and Third countries with assistance in dealing with the animal health certification required.

Border checks

When bees are imported from outside the EU the health certificates and paper checks are dealt with by Defra veterinary inspectors at specific places of entry into the EU, known as Border Inspection Posts. Imports into England and Wales are conveyed through Heathrow or Gatwick airports. Importers are also required to notify the authorities of the arrival of the consignments of bees using the importer notification form.

Legislation cannot protect us from illegal imports or questionable practices; beekeepers need to be informed so that they do not fall into the traps that could lead to the potential problems becoming actual ones. Caveat emptor! Let the beekeeper beware.

Ian McLean, NDB

Business Corner

Bee Diseases Insurance — A Review



At the last BDI committee meeting it was decided that all aspects of BDI operation and management should be subject to review. As a result all BDI shareholders, usually the member association secretaries, will be contacted with a questionnaire for completion by that association with their views and opinions. When this process is completed a review body will be set up to recommend how BDI should be run in the future. This review will take several months to complete.

BDI has a gross income including subscriptions and additional premiums in excess of £50,000 per year. The payment of claims and expenses had for several years exceeded the net income. Fortunately BDI had reserves to cover the deficit but were severely affected by the stock market collapse at the beginning of the Millennium and during the current decade. This deficit has been turned round and since 2005 we have been able to offer some modest sponsorship to the BBKA Spring Convention, the Welsh Convention and the National Honey Show. BDI are now funding a research project looking at the bacteria associated with European foul brood and its interactions within the colony. See BBKA News 187 for more information about this research. We hope to be able to carry on this support, which gives benefit to all beekeepers including those who are unaffected by foul brood diseases. Some might otherwise feel there are no benefits in belonging to BDI. Our logo, which was designed by our members is For Bees, Education, Protection and Research, which reflects our identity.

The committee consider that the main areas that need review are

the way that subscriptions and premiums are collected and whether and how BDI should be involved in other activities as outlined above. If you wish to put a personal view please make your opinions known to your secretary or email me. If you are interested in being part of the review body please let me know with an outline of how you may help.

Richard Ball, President BDI
richard.ball@fera.gsi.gov.uk

Fancy Helping at Hampton Court? Volunteers needed please!

The BBKA has again been invited to be present at the Hampton Court Palace Flower Show (5–10 July 2011). This year we hope to be using two 'live' hives to give demonstrations during the day on our exhibit in the RHS Edible Garden. We are looking for presenters and demonstrators (experienced beekeepers) to man the stand. The arrangement is spend half a day (morning or afternoon) on the stand and the other half is free to enjoy this fantastic show. Please send expressions of interest with an indication of days that you could or could not do to Tim Lovett: tjl@dermapharm.co.uk



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Business Corner

BBKA Training Post Extended

The BBKA is delighted to announce that Bill Cadmore, who was appointed for an initial six month contract, has had his appointment extended for a further twelve months from 1 April 2011. This post is jointly funded by the BBKA and the Healthy Bee Plan.

Following on from beekeeping trainers' days that have been run during the winter months, a series of summer events at apiaries are now planned. Later in the year the winter events to explain the Course in the Cases (CiC) will be restarted. These events which are aimed at those interested in training beekeepers are to explain the resources available to trainers and to encourage consistency and good practise.

We are keen to hear from local associations who are would like to showcase their apiaries and to be used as a base for a regional training event; contact Bill Cadmore bill.cadmore@ntlworld.com Regional training is a new venture for the BBKA and the aim is to try to ensure the high quality training programmes that some beekeeping groups have is spread across the rest of the country. Please do not be shy in offering to share what you are doing well for the benefit of everyone else.

The events will also be used to explain how the higher level CiC (red for improvers and green for proficient), which will be available shortly, can be used to continue the training programme for people who have kept bees for a few years.

Martin Smith, BBKA President

Education and Husbandry

Education and Husbandry Committee has been working on two new leaflets. The first is 'advice for beekeepers who wish to give up beekeeping' in a responsible fashion by dealing with the safe disposal and movement of colonies, equipment and sheds. If you have members who have decided not to continue with beekeeping over the winter, please consider using this.

We are also trialling an advice booklet aim of 'beekeeping on commercial and heritage locations'. This gives advice to the owner about bees and beekeeping, and contains a comprehensive list of areas for risk assessment, some of which you may not have considered. Copies of both leaflets are available via the National Beekeeping Centre.

Work is well advanced on the preparation of a QCF Level 1 course in beekeeping. We hope to have this approved by the relevant curriculum authorities by the time you read these notes. The QCF is the current Further Education credit/teaching unit system, which has replaced the 'old' NVQ system.

We are continuing to progress work on the catalogues of the Cowan and Cotton book collections and make these available on-line. These are both collections of old beekeeping books, some of considerable rarity. In the meantime, we have a 'scanned' copy of both original typed catalogues — these are available via the office, together with a note about both collections.

Chris Deaves, Chairman, Education and Husbandry Committee

Governance Committee

The Governance Committee continues to assess the effectiveness of governance and risk management processes in accordance with current Charity Commission guidance. As 'keeper' of the BBKA Constitution, this includes making sure that the ADM is well prepared and successful; attracting nominees for trusteeship who have skills to add value to the work of the Executive Committee, and seeking ways to ensure trustees, staff and volunteers feel supported in their roles.

Dawn Girling, Secretary, Governance Committee

BBKA Membership Survey

As you are aware the interest in beekeeping has increased dramatically over the last few years, and as a consequence, the membership of our associations has grown in number. Over time the craft of beekeeping has also changed quite markedly as, we think, has the profile of the British beekeeper. To gain a better understanding of our membership, its age, gender, experience etc, we are carrying out our first membership survey since the register was set up. This survey is online, but if you would like a paper copy please ask — Tel: 02476 696679 — and we will post one to you.

By completing the survey online our costs will be kept to a minimum and will provide us with an easy analysis of the results. The survey, in which your response will be anonymous, is quite detailed, but we do not intend to do them frequently so by taking part you will be helping us to ensure that we provide you with the benefits you want and the information you need — it is after all your association — while also providing us with a profile of the 21st century beekeeper. To take part please go to the members area on the BBKA website www.bbka.org.uk

Jane Moseley, Operations Director/ General Secretary, BBKA

Stoneleigh Shows

The committee has been planning and organising the Edible Garden Show at Stoneleigh and Gardeners' World Live at the NEC. The Edible Garden Show, held in March, attracted an audience of nearly 11,000 people and the BBKA garden was visited by most of them! There was much interest in the display and the stewards were kept busy throughout the show. Jim Paice MP, Minister of State for Agriculture and Food, visited the garden. The Gardeners' World presenter Alys Fowler was our invited celebrity. Many favourable comments were received and one visitor wrote: "Many thanks for the time that your members spent with me and my best friend at the Edible Garden Show. We are complete novices and your stewards were very inspiring and very informative. We both look forward to keeping bees in the next couple of years. Your stall was a credit to your association and was by far the most informative and very very helpful — I came back buzzing with information". Our efforts will now be focussed on the Gardeners' World Live Show (15–19 June). If you can steward, contact Clive Joyce (email: c.joyce1@ntlworld.com). After, or before, you have completed your duties, you will be free to see the show.



Photo: Clive Joyce

Brian P. Dennis, Chairman, Stoneleigh Shows' Committee

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The National Honey Show

St George's College, Weybridge, Surrey
27-29 October 2011

Our Offer for New Beekeepers in 2011

Is it a bit early to be thinking about the National Honey Show? Well, not really, especially if you are new to beekeeping and joined your local association after 1 August 2010. Is that you? If so, in 2011 you can attend the National Honey Show on the day of your choice at the reduced rate of £5 (instead of the new daily admission charge of £15). On that day you will be able to see the exhibits, visit the Trade Hall, attend lectures and workshops, although workshops must be pre-booked.

To get your ticket at the reduced rate you need to ask your association secretary to apply on your behalf to the NHS General Secretary. Your secretary will need to supply your name, address and your email address if you have one. The cut off date for applications is 31 July 2011 and time rushes by when the season starts so get that application in now.

H F Capener,
Honorary General Secretary, National Honey Show

Diary of Events

14 May. York and District BKA Annual Auction at Murton Museum of Farming. Enquiries: Nigel Davies on 01904 468001.

21 May. Sussex Beekeepers' Association Annual Beemarket. Heathfields Community College, TN21 8RJ. Harold Cloutt 01424 838302.

9-11 June. Royal Cornwall Show. Schedules available 1 March from Sheila Sleeman, tel: 01872 863842.

27-29 October. National Honey Show, Weybridge, Surrey.

eBEEs

eBEEs is the emailed version of the 'Bee Editors Exchange Scheme', which was started by Jeremy Burbidge of Northern Bee Books over twenty years ago as a manual system. This has progressed to eBEEs, an electronic system managed by Chris Jackson, editor of Derbyshire BKA newsletter. A new website has been set up so that any editors that might want to join the scheme can find out more at <http://www.ebees.org.uk/>

Your Letters



Dear Ed.



Self-Destructing Varroa Mites

We had Ron Hoskins, from the Swindon Conservation Group, visiting our division presenting his work on bees with inherited good hygienic behaviour. He told us that for the last ten years, he has successfully managed his hives with no treatment, by selecting his queens, those which have produced workers displaying 'natural' instincts — removing the mites from each other.

How easy can it be! A simple process of rearing queen bees, freely accessible to every beekeeper. So it is with amazement that I read someone believing the solution could lie in the manipulation of genes. As the article suggests, mites lead to infection and disease. Perhaps, the solution is to find ways that improve immunity, support and promote the health of our bees. Relatively modern issues which directly correlate to the great reduction in our bee populations are man-created, man-inflicted and man-induced. Genetically modified mites are 'to me' just another step towards catastrophe! Catastrophe being no understatement when we consider the importance of bees within our ecosystem. The idea of a genetically modified mite seems distant from the common sense of our natural order. It has now been demonstrated, bees can live with the mites if managed well. It seems man has no end for his desire to manipulate mother nature.

Franck Baudrain,
Frome, Somerset BKA

In Response

After reading the article in February BBKA News entitled 'Self destructing varroa mites?' I can understand why some readers may have misinterpreted the technology used by the original work; in particular, one of the two sub headings was entitled 'Manipulating varroa genetics'. The technology described in the original work by Alan Bowman and I, RNA interference, certainly did nothing of the sort! 'Manipulating varroa genetics' sounds frightening, emotive and Frankenstein-like, which could not be further from the truth.

RNA interference does not change the genetics of the varroa mite in any way, shape or form. The cellular systems for RNA interference are naturally occurring in all of us, and are designed to help our bodies deal with virus infection and help us regulate the expression of our own genes. This system is present in humans, honey bees, varroa mites and even nematodes! Every day we are all exposed to the type of organic molecules that comprise the proposed future treatment for varroa. The varroa mite is even exposed to the exact same organic molecule that could constitute a treatment, every day of its existence. All we are doing is trying to adjust mite exposure to that same molecule, thereby disrupting the normal cellular behaviour of the mite. The proposed treatment harnesses systems and molecules that are naturally occurring in varroa mites. The varroa mite genetics remain unchanged. Honey bee health is paramount to my colleagues and I working at the National Bee Unit. Our work always has bee health at its heart.

Dr Giles Budge,
Research Coordinator, National Bee Unit, York.

In Further Response

I felt it important not to overlook this 'news story', which had hit the international headlines and TV stations in December 2010 and January 2011, in the first 2011 issue of BBKA News. It was my intention to explain briefly a little of the detail, rather than emulate the content-lacking, headline-grabbing media hype that we had hitherto been presented with. By now, readers will have read the expert overview of RNAi technology in the April issue of BBKA News by Rachael Baker and will understand, more clearly, what is involved. It is precisely *because* geneticists have been able to determine the close relationships between the coding DNA, mRNA and their encoded proteins that we are now able to target specific proteins and arrest their production. Using RNAi, this can be achieved by introducing into a cell externally synthesized short stretches of double-stranded (ds) RNA molecules based upon the (known) target protein mRNA sequence. As Rachael Baker described, these dsRNA molecules trigger a series of events leading, ultimately, to lower levels of the target protein than would have normally been expected had the dsRNA molecules not been introduced. The cellular processes that respond to the presence of dsRNA and result in reduced protein levels are, indeed, naturally occurring — and are thought to have evolved to prevent cells from expressing foreign genes that might gain entry to the cell, such as could occur during viral infection. The mites themselves are not genetically modified; scientists are using their knowledge of the mites' genome to selectively adjust aspects of the mites' cellular functioning.

Potential applications of the RNAi technique are being examined in a variety of systems with the aims of disease prevention and increased understanding of cellular functions (for example, large-scale field application to reduce Israeli Acute Paralysis Virus disease in honey bees by Hunter *et al*, PLoS Pathogens, 2010; available at: <http://www.plospathogens.org/article/info%3Adoi%2F10.1371%2Fjournal.ppat.1001160>). Obviously, it would be foolish to resort to expensive genetic approaches to the varroa problem rather than select for good hygienic behaviour as highlighted in Ron Hoskin's excellent article, or use IPM as promoted by the BBKA and NBU. Perhaps, however, it would be equally foolish not to investigate and evaluate additional new approaches that might reveal important information or benefits that would otherwise not have been discovered.

Incidentally, the 'm' word is derived from the Latin *manipulus* — *manus*, hand + *pulus*, full or fill — and one of its many definitions is 'to handle skilfully'. Geneticists, microbiologists and other scientist often use the term when they are referring to a general overview of techniques, such as those involving the handling of molecules. My use of the 'm' word was not in a derogatory sense, nor an attempt to cause outrage or offence; I know that I am not the first scientist to use it in association with this technique — and I have no doubt that I will be the last. The press release 'Bee scientists to force killer mites to self destruct' is publicly available at: <http://ww2.defra.gov.uk/news/2010/12/12/bee-scientists> and the original research paper is quoted within this, so readers can download and read both at their leisure (and eagle-eyed readers may spot the 'm' word lurking in reference 10!).

Dr Christine Knott
Deputy Editor, BBKA News



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