

BBKA News

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



No: 201 – May 2012



Biological Controls in the Hive

Befriend enemies of your bees' enemies ... they may be biological pest control options, see page 14.



Swarming Bees are Healthy Bees

Get to grips with swarm management to maximise its benefits to your colony's health, page 16.



Biology and Spread of EFB

For a research update and progress report on understanding more about the bacterium responsible for EFB, turn to page 19.

Neonicotinoid Effects on Bees

Two new papers on the possible effects of neonicotinoid pesticides were published recently in *ScienceXpress*. As a result, the BBKA has issued the statement below, which is also available on the BBKA web-site. The principal action point is a call for the competent authorities in the UK and Europe to review and publish their detailed opinions on these new findings, rather than issue bland generalised statements. Abstracts of the papers can be seen by searching on 'neonicotinoids' at: <http://www.sciencemag.org/content/early/recent>.

BBKA Statement 30 March 2012: The BBKA today reiterates its call for an urgent review of all available data on the effects of neonicotinoid pesticides on bees. The work reported in *Science* by Goulson *et al* on bumblebees and Henry *et al* on honey bees is a matter for concern.

It is vital that the UK authority, namely the Chemicals Regulation Directorate, reviews this new and other recently published data in depth and reports back in a full and transparent fashion. The findings and limitations of these studies and their

relevance to bee health must be subject to scrutiny, and appropriate action taken, if justified. The BBKA also renews its call on the competent EU authority to review the regulatory requirements for products in this new class of pesticides in order to detect possible sub-lethal effects, which may not be picked up by current testing regimes. Over time, the BBKA has campaigned for more research into this group of compounds as evidenced in its paper *Honey Bee Health Research Concepts* (Jan 2009) and earlier papers submitted to Government. The BBKA itself is funding research on pesticide residues in bee colonies at Keele University.

Honey bees and bumble bees share the same environment and may be exposed to the same negative influences of poor forage availability, diseases, bad weather and agrochemical products. The BBKA is currently conducting its fifth annual winter survey of honey bee colony survival, which will be reported as soon as the data are gathered and analysed.

Tim Lovett, BBKA Public Affairs Director





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Chairman's Letter



By the time you read this, many of us will have attended the Spring Convention and will already be using the new equipment purchased from the trade stands; and making good use of information picked up from the lectures, workshops and conversations with other beekeepers. I hope you enjoyed the Convention at its new venue and my thanks go to all the organisers, stewards and helpers

whose work makes the BBKA Spring Convention the premier beekeeping event in the UK. Thanks are also given to those involved in the BBKA stand at the Edible Garden Show held at Stoneleigh. Visitors to the show were attracted to the stand and it was a good venue to tell the public more about the role of honey bees in their food supply.

No matter how long we have been keeping bees, we can all continue to increase the range of our beekeeping skills and competencies. This is not just learning for learning's sake; it is part of our on-going interest in our craft that will help us to work with our bees in ways that are mutually beneficial. The very idea of wanting to learn and improve opens up the mind to new ideas and encourages us to be more observant. So why not look up a few training events and consider whether attending them will improve your beekeeping.

Having decided that we would like to increase our skills we need to find those who can teach and demonstrate them. Most beekeeping associations successfully run training events and the contributions they make to the overall improvement and enhancement of our skill base is very significant. Of course to run successful training events we need good trainers, i.e. beekeepers who understand the subject and are able to communicate well. My thanks go to all those who arrange courses and to the trainers who teach. They are the lifeblood of our associations helping to pass the craft from one generation to the next.

There is no doubt that beekeeping needs to evolve to keep up with the increasing challenges to our bees and there is an increasing amount of technical knowledge and expertise that we need to successfully manage our honey bees. As beekeepers want to improve their skills, trainers must ensure that they are up-to-date and able to teach and demonstrate skills which reflect current thinking and understanding. So this is a plea to all trainers to also improve their knowledge and skills. In this way the skill base of the craft will increase and our bees will benefit.

Beekeeping associations vary in size and capability in running training events. I am sure that by making your neighbouring associations aware of your training events you will mutually make the best use of the training resources available.

Dr David Aston, BBKA Chairman

Cover photos: Main image: Roger Cullum-Kenyon; Right-hand panel, Top: David Wootton; Middle: John Haverson; Bottom: Courtesy of Fera.

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What a Pleasure Training is — But Why is There so Much of It?

It has been my great pleasure to work with many congenial and knowledgeable trainers and trainees throughout my eighteen months as Regional Training Coordinator for the BBKA. As my contract comes to an end I can honestly say that each training that I have been actively involved in has been both enjoyable and rewarding, because it has been so good to work with so many positive and cheerful people all interested in training and beekeeping. I would like to begin by thanking all of those who have acted as trainers for the 'Train the Trainer' events and all attendees of the events. It has been my pleasure to work with you all.

As we change the training emphasis from centrally organised events, such as those I have managed, to locally focussed activities it is useful to consider the range of training that is available to beekeepers and the function that each serves.

National events and workshops

All members have the opportunity to hear internationally and nationally recognised expert speakers at the BBKA Spring Convention and the National Honey Show. More importantly we are able to explore topics in beekeeping that cannot adequately be covered within our smaller district clubs. These events also provide excellent networking opportunities for committee members active at the national level.

Area association lectures and workshops

We have a great deal of expertise within our membership, spread across many area associations. These events give us the opportunity to spread knowledge and skills between associations. The atmosphere at these events is always very supportive and encourages the exchange of good practice between local groups.

Local association training

These can be the most important training events allowing established members to make contact with new members and build relationships within the group. In recent years these events have concentrated on providing courses for new beekeepers, but we are seeing more continuation courses being provided for those members with a few years' experience. Many local associations also put on 'master class' training to meet specific needs such as swarm control or bee breeding. Candle

making and microscopy classes are also becoming more common. In addition, some local associations are very active in promoting the BBKA Module Examination system and run regular study groups for this purpose. Local training has the great advantage of getting members embedded in the organisation; in effect you are building your future committee members.

Train the trainer initiative

These nationally organised events, which I have managed as the BBKA Regional Training Coordinator, have had very specific aims to stimulate training in three areas. These are (a) building local association training capacity to train new beekeepers and novice beekeepers, (b) encouraging members to study and pass the General Certificate in Bee Husbandry with a view to become an effective trainer in the apiary, and (c) encouraging associations and groups of individuals to establish effective study groups with a view to increasing the pass rate for the whole range of qualifications offered by the BBKA Examination Board. Course in the Case (CiC) materials have been used throughout these events. The main theme of these events has been to encourage very qualified beekeepers to become more effective trainers.

New locally-based initiatives

These training events have now served their purpose and we are moving towards a system through which two new Training Coordinators will support locally-based training initiatives; one will be based in the south and one in the north of the country. These coordinators will work at the area level to build local training programmes and they will aim to establish pilot programmes within the next few months. So watch out for more news of their activities; I am sure they will build on the work that I have completed in the last 18 months.

Course in the Case

As beekeepers we understand that we face a life-long learning opportunity to improve our knowledge and skills. CiC is organised on the principle that beekeeping should provide for our continued professional training and it builds in stages of experience rather than being tied to the examination system. CiC works because it provides this continuum of training and can bring cohesiveness and commonality to training courses provided by local associations.

Fera training

In addition to the valuable training provided by the Bee Inspectors, Fera has sponsored training in several areas including the Train the Trainers initiative, CiC and the NDB short courses. It has also been very active in promoting the City and Guilds 7303 PTLs course for trainers. The many beekeepers who have attended this course have all reported on how useful it has been in developing their training skills.

NDB short courses

The National Diploma in Beekeeping (NDB) Short Courses offer intensive weekend events for those who wish to become more expert in a specific area of beekeeping. This, in turn, should enable them to be more effective in the training events they run. These courses can, of course, be enjoyed simply for the individual's pleasure in learning.

LANTRA qualifications

BBKA have worked hard with LANTRA (the land-based training qualifications authority) to develop two fairly low-level beekeeping courses designed to be delivered within the context of broader land-based training. For example, people on agricultural courses can study a beekeeping unit. A strong element of these courses is the health and safety aspect of beekeeping. These courses are generally delivered by experienced beekeepers. The second, higher qualification is roughly equivalent to the BBKA Basic.

BBKA correspondence courses

The BBKA offers members the opportunity to study for many of its qualifications via a correspondence course where the assigned tutor will provide help and support to those studying for BBKA qualifications. Details are available on www.bbka.org.uk

In conclusion

This 'jigsaw' provides us with opportunities to develop our skills both as beekeepers and as trainers so that we can become an even more effective and professional organisation. The range and scope of training available aims to give all members opportunity to be involved at a level which best suits them.

Bill Cadmore,

BBKA Regional Training Coordinator
2010–2012

In the Apiary

May is the time when colonies of bees can get out of control unless you help them to expand the brood nest and ensure that when the bees wish to swarm they can be helped through the process. The first (helping to expand the brood nest) is commonly known as swarm prevention and the latter is related to swarm control. Because you, the reader could come from the furthest South-East or the beautiful North-West it is unwise to relate the state of a colony to months of the year so, if you can bear with me, May can either be prime time for swarming or a period of rapid build up of the colony.

At this time of the year most queens will have reached their peak rate of egg laying. I have heard figures from about 1,500 to 6,000 eggs a day from well-nourished queens, well in excess of the queen's body weight. At an egg laying rate of, say, 3,000 per day the colony could grow to more than 100,000 bees if this rate was to continue. Of course, the queen's laying rate will depend on the ability of the workers to find enough food for the colony and space within the hive for the queen to lay. If space runs out the bees will naturally swarm and try to create a new colony (natural colony reproduction).

Many beekeepers see swarming as a bad thing; bees out of control and potentially causing a nuisance to neighbours. Swarming is a natural process of colony replication and without this process honey bees would have died out many years ago. It is one of the most important activities of the colony that we must understand, and we must work with the bees to help them through the process. There are very many methods of swarm control that have been proposed over the years and it is incumbent on us to learn one or two of these so that we may be prepared when the colony is in a position to swarm.

When a colony swarms naturally about half the bees leave with the old queen. The remaining half is usually left behind with a few sealed queen cells that will eventually produce a virgin queen. The colony effectively divides into two colonies that have the ability to survive the forthcoming winter. In order to swarm the conditions must be right so you should not expect every colony to swarm every year. Bees will prepare to swarm if the volume in the hive is not sufficient for continued growth and if there is plenty of food about. Having said that there are instances when colonies will

swarm for other reasons, such as disease, or just because some colonies seem more genetically prone to swarming. In these latter cases at least one of the two colonies is unlikely to survive.

Having swarmed the group with the old queen will find a new nest site and rapidly create wax comb to start the process of raising brood and collecting stores. Later in the year the colony will probably create another queen and supersede so that it has a new young queen ready for the next spring. In the meantime the old residual colony will raise the virgin queen, encourage her to mate and then work hard to build the colony up again.



Marked and clipped queen. Photo by Dr Bee.

Methods of swarm control try to replicate these natural processes without the need for the bees to fly out of the old hive and seek a new home. In effect we divide the colony and provide the home for the swarming group. When done properly the bees behave as if they have swarmed and get on with rebuilding their numbers.

In this article I do not intend to describe any specific method of swarm control. There are many and they are

best learnt by going to association meetings and having them demonstrated. Alternatively there are videos on the web and there is one in the Proficient Course in a Case. The Novice Course in a Case also has a set of slides that show a method of artificial swarming. In all these methods it is well to remember that once the colony has started to make preparations to swarm by producing queen cells that have young larvae in them, any action by you to remove all of these might prevent swarming for a few days but will also demoralise the colony. Do not try to prevent the process but work with your bees.

When we practice swarm control using an artificial method to divide the colony we generally separate the 'flying' foraging bees, i.e.

the older ones, from the younger 'house' bees, the nurse bees, and we leave this latter group with the brood while the former group are collected with the old queen. This unbalancing of the distribution of bees in each colony is easy to achieve by moving the brood from the original site. House bees stay with the brood and the foraging bees return to the original site. I wonder if this is what happens in nature!

In the natural process the swarmed group need to build wax

comb in the new nest site as quickly as possible and start to raise brood. Similarly the colony that remains needs foraging bees to bring in new stocks of pollen and nectar to nourish the brood. It has been shown that there is a natural balance between the number of foraging bees and house bees that is maintained by the presence of foraging bees delaying the development of house bees. When we separate the colony using an artificial swarm method we disrupt the balance and house bees develop more rapidly to become foragers; likewise, in the absence of house bees, foragers will revert to the duties of house bees. This process will take a few days and during the process the two colonies will be unbalanced and



Plenty of supers on a hive in spring. Photo by Dr Bee.

stressed. If you watch a swarm leaving a hive you will notice many bees rush out of the hive, almost in panic. The swarm collects in a nearby tree or hedge and as it settles, many bees will be seen flying between the swarm and the hive. I believe that this is the time that the colony divides to ensure that there are both house bees and foraging bees in both the resulting groups. I am sure that the majority of house bees stay with the brood and most, but not all, of the foragers go with the old queen.

“ Once a colony has started to make preparations to swarm by producing queen cells containing young larvae any action by you to remove all of these might prevent swarming for a few days, but will also demoralise the colony. To avoid this do not try to prevent the process, but work with your bees. ”

Learn a method of swarm control that suits you and your spare equipment and when your bees are ready to swarm you should rejoice as it means that they are doing well. If your support for this natural phenomenon goes well, the bees will settle down for the rest of summer to build their numbers and prepare for the winter. Either you will have two colonies where you originally had one or you will have two colonies with laying queens that can be united later to provide one large colony with a new young queen. Either way the bees have done you a favour and you have helped them to remain in your care and prevented them from being a nuisance to the neighbours.

Dr Bee



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Taking and Hiving a Swarm

Many people are taking up the craft of beekeeping for the first time. One way to get started is by obtaining a swarm. As the swarming season approaches, the National Bee Unit offers some advice on good practices when collecting and hiving a swarm.

- ❑ Do not attempt to take a swarm which is difficult to reach or if to take it would be dangerous.
- ❑ Make certain that you have the permission of the property or land owner before attempting to take the swarm.
- ❑ Be sure that you are fully equipped. Equipment should include a suitable stout container, such as a skep, robust cardboard box or a nucleus box containing frames of wax foundation. The latter is the preference of most beekeepers. If you chose to use a skep or box, then you will also need an old loose-weave sheet to cover or wrap the container and a piece of plywood (or strong cardboard) big enough to cover the open part. Additional equipment should include a smoker, a water spray containing water, a plastic cup, secateurs and a bee brush.
- ❑ Ensure that the area is clear of members of the public or livestock before commencing to collect the swarm.
- ❑ Assess how you intend to take the swarm, e.g. if it is on a bush, will it drop straight into the container, or is there a need to cut foliage away? If there is, ask the owner's permission before you start cutting the foliage. If it is on a post, would a skep be the best thing to use? If so, can the bees be brushed into the skep or will they need to be smoked upwards into it?
- ❑ It is very difficult to take swarms from enclosed spaces, e.g. inside walls — under such circumstances, consider whether swarm removal is safe or practical. If not, then it may require removal by professionals.
- ❑ If some bees are exhibiting waggle dances on the surface of the swarm, then your time to take the swarm is limited as they are about to depart to a new location.
- ❑ If you can, it is a good idea to secure your container in the position that you intend to collect the bees. However, sometimes you will need to hold the container, as firmly as possible, directly underneath the swarm.
- ❑ Before moving the bees into your chosen container, where possible spread a large sheet over the ground, directly underneath the swarm so that you can capture any bees that miss the container. Then either use a single, sharp, downward shake (if on a branch), dropping (if the branch needs to be cut off), or by brushing or smoking them. Look carefully to see whether you can see the queen. Bees not falling into the container will land on the sheet and walk in themselves if the queen is there.
- ❑ If you are using a nucleus box, one of the best ways of hiving a swarm is to take some of the frames out of the box (thus making a gap of two or three frames depending on swarm size), hold the nucleus box up under the swarm, then shake the bees sharply straight into the middle of the box, and place the box onto the ground. Carefully replace the frames, put the crown board on and allow the bees to settle. This simple method works well.



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



- ❑ Lightly spraying the bees in the container with water will help to settle the swarm.
- ❑ If you are using a nucleus box as your container, then swarm collection is complete and you can either leave *in situ* if in a safe place or move to an apiary location of your choice.
- ❑ If you are using a skep or box, there are additional things that you have to do: put your sheet of cloth on the ground and then invert the skep or box with one edge propped up by a small stone or similar so that it leaves a small space large enough for a bee or two to enter as they move upwards. Some may find a sheet of plywood on top of the sheet useful.
- ❑ Whatever type of container you use to collect the swarm, if there are bees gathering near this gap and fanning their Nasanov glands into the air, you have almost certainly collected the queen. If not, the bees may well emerge and return to their swarm position so you may have to start again!
- ❑ If the swarm is in an inaccessible place such as in coils of barbed wire or in the middle of a hedge, place the container over it or nearby as described above, take several handfuls or cupfuls of bees and shake them into your container. Normally they will fan their Nasanov gland so when this commences smoke the cluster to break it up and the swarm will reform in the skep or container.
- ❑ If there is a wind blowing and you cannot place the container over or under the swarm, place it upwind so the scent of the Nasanov glands from collected bees drifts toward the swarm.
- ❑ Once the swarm has re-clustered, if you are using a box or skep, wrap your container with the sheet and move it carefully to an apiary where you have a hive prepared to take the swarm. This is best done during a cool part of the day, such as the evening, as the swarm will generate a significant amount of heat when being moved. Before transferring your bees from the box or skep into the hive, ideally, you should use new, undrawn foundation — this will prevent the bees from storing any honey stores they have brought with them in their honey crops as they will use it in the production of comb. This reduces the risk of disease transference. However, if the swarm is taken late in the year and bees have limited time to draw out the wax foundation for their nest, then you may have to use clean sterilised drawn comb.
- ❑ When using new, undrawn foundation, place a queen excluder under the brood box for a couple of days. This gives the swarm time to build a nest and re-establish colony cohesion, thus reducing the risk of the bees absconding. This is not necessary if using drawn comb, which is readily accepted by the bees.
- ❑ There are two methods of hiving the swarm; it can be tipped into the top of the hive or the bees can be 'walked up' into the hive over a board covered with a sheet. This is often called 'running in'. (Note: if 'walking' the bees into the hive, only put the queen excluder in place after all of the bees are in the hive). If tipping the bees into a hive, make a gap in the frames into which they can be shaken.

Insurance Policy Notice: Under the BBKA insurance policy there is a height restriction of three metres when collecting a swarm. If you are working above this to collect a swarm, you will need to contact Towergate, the BBKA's insurance brokers, beforehand.

Other things to remember

- ❑ You will need to be sensitive to the weather and forage conditions to be sure that the swarm does not starve. After 24 to 48 hours check to ensure that the bees are drawing out the foundation and, if the queen is laying eggs, then the queen excluder can be removed. If not, offer the swarm a feed of 1:1 strength syrup (1kg white granulated sugar to 1260ml water) and recheck after a further 24/48 hours.
- ❑ If the swarm is a cast (i.e. a product of multiple swarming) and therefore headed by a virgin queen, she will need to go on mating flights. The queen excluder should not be left in place for longer than 72 hours.
- ❑ Once the queen is laying eggs you now have a colony instead of a swarm, and its development, health and wellbeing should be monitored as with any other colony. There is a clear link between swarms and potential spread of pests and diseases. So, if you do not know the origin of the swarm take it to an isolation apiary if available. When established it can be assessed and checked for disease before introducing it into an established apiary. These checks should be made over two full brood cycles — a minimum of six weeks. However, there is no harm at all in a longer isolation period. Some diseases (e.g., EFB) can take much longer to show symptoms, and some beekeepers may isolate for up to two seasons (years).
- ❑ If you are new to beekeeping, it is a great idea to get some advice from an experienced beekeeper about these methods before you attempt them yourself — the fastest way to learn is by watching an expert in action.

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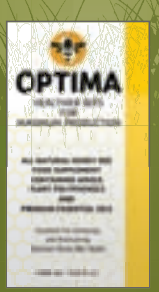
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Pesticide Risk Assessment for Pollinators Workshop:

A Beekeeper's view

With current concerns regarding the losses of bees and colonies, readers of *BBKA News* will be interested to know that a 'Pesticide Risk Assessment for Pollinators' Workshop was held in Florida, US in January 2011. One of the aims of the workshop was to 'explore the state of the science on pesticide risk assessment for pollinators'.¹ The workshop addressed both spray and systemic pesticides and the risks to honey bees and non-*Apis* bees. In this article I will review the workshop summary, comment on the research and recommendations and conclude with a proposal. Readers are recommended to read the full summary available from the Society of Environmental Toxicology and Chemistry (www.setac.org).

Ryabov and Evans (2011)² identify habitat loss, pesticide usage, climate change and the spread of pests and pathogens as providing 'a cocktail of anthropogenic pressures' on natural and managed insect pollinators. The SETAC workshop summary acknowledged that 'honey bees frequently are subject to collateral effects from the use of pesticides in crop production' (p6).¹

Systemic pesticides are applied as a seed coating, so they protect the plant against pests from within. The advantage is that they are placed exactly where they are needed, far less insecticide than other types of application is used and, in theory, they should not contaminate other environmental areas as much, for example, as spray drift. However, some concerns have come to light which are now being addressed.

The active ingredients in the majority of systemic products are neonicotinoids. The Chemicals Regulations Directorate (CRD) approved neonicotinoids for seed treatment are clothianidin, imidacloprid and thiamethoxam.³ Clothianidin was approved for use in 2002 and by 2010, over 1.2 million hectares of arable land in Britain, i.e. 26% of all cropland, were sown with seeds treated with neonicotinoid insecticides.⁴ Data on areas and crops are given in Table 1.

When evaluating the effects of insecticides on non-target species, it is necessary to differentiate between 'hazard' and 'risk'.

Simply put, 'hazard' identifies the effects a substance might cause to a bee. 'Risk' assesses the dose of the substance that a bee might encounter as a result of the intended use. Most neonicotinoids are highly toxic to bees by contact and oral exposure. A lethal oral dose of clothianidin (LD₅₀ measured 48h after exposure) for a honey bee is 4ng/bee (4 billionths of a gram per bee). Relative to DDT, thiamethoxam, clothianidin and imidacloprid are over 5,000 times more toxic than DDT (Table 2; van Dijk, 2010).⁵ Neonicotinoids are neurotoxins that bind to critical receptors in the central nervous system of insects and prevent their function. The damage is virtually irreversible and cumulative.⁶

Pesticide	•	utilisation	LD ₅₀ (ng/honeybee)	Toxicity index relative to DDT
DDT	Dinocide	insecticide	27 000	1
Amitraz	Apivar	insecticide / acaricide	12 000	2
Coumaphos	Perizin	insecticide / acaricide	3 000	9
Tau-fluvalinate	Agistan	insecticide / acaricide	2 000	13.5
Methiocarb	Mesulol	insecticide	230	117
Carbofuran	Curater	insecticide	160	169
A-cyhalothrin	Karate	insecticide	38	711
Deltamethrin	Decis	insecticide	10	2 700
Thiamethoxam	Cruiser	insecticide	5	5 400
Fipronil	Regent	insecticide	4.2	6 475
Clothianidin	Poncho	insecticide	4.0	6 750
Imidacloprid	Gaucho	insecticide	3.7	7 297

Table 2. Toxicity of insecticides to honeybees (van Dijk, 2010)⁵.

Workshop review

Section 1 covered honey bee biology. The aim of pesticide regulation is to protect non-target species in general and pollinators in particular. The assessment of the risk to bees of pesticides is complicated by the use of in-hive veterinary medicines and the exposure of bees to mixtures of pesticides. Foraging bees are vulnerable to contact and oral exposure during the collection of pollen and nectar. If foragers bring contaminants back to the hive, the queen, drones, house bees and larvae will have secondary exposure to pesticides through contaminated food.

Section 3 described the purpose of 'protection goals', which identify the priorities that regulatory authorities ought to follow. One of the protection goals is to protect the honey bee, because it is an important pollinator, a producer of honey and a contributor of pollination diversity.

Section 4 provided an overview of the pesticide regulatory process. Regulatory authorities are responsible for the evaluation of pesticides and the risks associated with their use. There are three tiers in the risk assessment process. Tier 1, the lowest tier, identifies compounds that may present a potential risk. Higher tier assessments include semi-field (cage or tunnel) tests and field tests, and refine the estimates of potential exposure and potential effects. Assessors proceed through the risk assessment process to the higher tiers of analysis to determine whether the estimate of risk for intended use of the compound is sufficiently consistent with the protection goals. If not, the product may not be registered or

Table 1. Neonicotinoid treated seed usage in Britain 2010^{3,4}

Neonicotinoid	Neonicotinoid treated seed Area ⁴ (ha)	Pesticides/plant protection product database: crops approved for treatment ³
Clothianidin	728 209	Cereals, oil-seed rape, maize (forage & grain), sweet corn, beet (fodder & sugar)
Imidacloprid	184 621	Oil-seed rape, beet (fodder & sugar)
Thiamethoxam	293 182	Rape (oil-seed & fodder), beet (fodder & sugar), mustard
Total area treated	1 206 012	
Total crop area	4 555 561	

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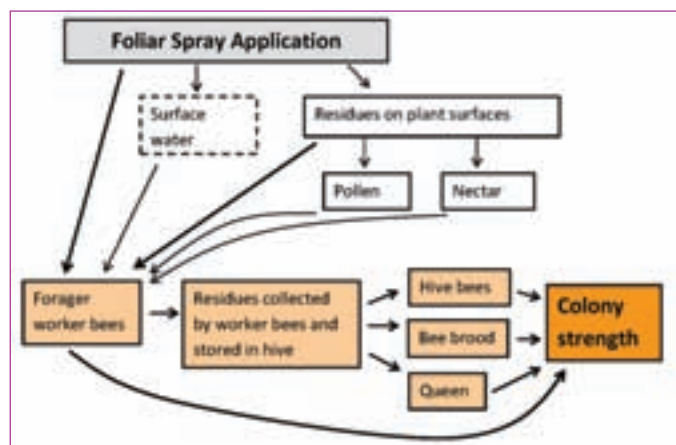


Figure 1. Stressor source, potential routes of exposure, receptors, and attribute changes for a non-systemic pesticide applied as a foliar spray.¹

techniques to mitigate the risk may be implemented.

Section 6 assessed the exposure of bees to pesticides. Figure 1 illustrates the exposure routes for a non-systemic pesticide which is applied as a foliar spray, i.e. onto the leaves of plants.

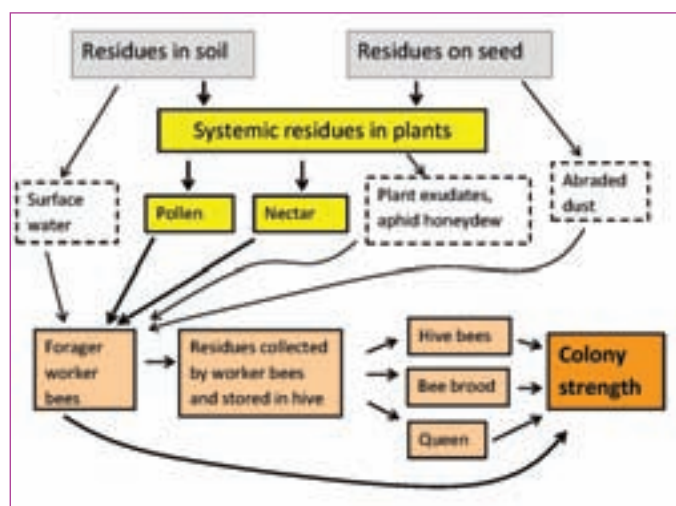


Figure 2. Stressor source, potential routes of exposure, receptors, and attribute changes for a systemic pesticide applied to the soil or as a seed dressing.¹

Comparatively for systemic treated seed, the significant routes of exposure are through ingestion of residues in pollen, nectar and processed bee food (brood food or royal jelly). Other routes include contaminated drinking water and hive material, e.g. comb wax. Exposure sources that are unique to systemic pesticides include the dust from seed treatment, consumption of aphid honey dew and guttation water (Figure 2). Guttation drops form on the tips or along the edges of plant leaves due to increased water pressure within the plant (Figure 3).

Section 7 discussed the laboratory assessment of pesticide hazards. Tier 1 testing is carried out on groups or individual bees and larvae to determine the toxicity of active ingredients. Extrapolating effects observed on the individual bee to effects on the whole colony is difficult.

Section 8 described semi-field and field studies. A semi-field study is one that is performed on a crop that is grown outdoors in an enclosed system with controlled or confined exposure. A field study is one that is performed on a crop that is grown outdoors

with no enclosure. The bees are free-flying and able to seek out alternative food sources, a difficulty in the field study test design. The aim is to test potential effects of a pesticide under realistic conditions.



Figure 3. Bee drinking guttation drop (European Beekeeping Coordination, 2011).⁷

Section 9 explained the risk assessment process, which provides the basic elements from which risk estimates are derived. Risk assessors consider measures to reduce potential risk of exposure. If sufficient data identifies that the intended use of the pesticide is inconsistent with the protection goals, but the use is considered to be necessary, then regulatory authorities will seek to mitigate that risk.

Section 12 addressed the mitigation and management of risk. A regulatory authority may mitigate risk by denying registration on a particular crop or site, or by modifying the manner in which a pesticide is used. Warning language on product labels should ensure consistent interpretation and implementation of the mitigation strategy. Key to managing pesticide risk to bees is to know when bees are likely to be present at an agricultural site, and attempting to avoid spraying during the bloom or foraging periods.

Research and recommendations

The aim of the research recommendations was 'to lead to improvements in the risk assessment process for pollinators'.¹ Seven recommendations of interest to beekeepers are listed below.

- ❑ **To compile pollen and nectar pesticide residue data.** The aim is to compare pollen and nectar pesticide residues with pesticide application rates. This is of critical importance since bees can be exposed repeatedly to doses of systemic insecticide when they collect nectar and pollen.
- ❑ **To assess guttation as a source of exposure of bees to systemic pesticides.** Guttation drops are a source of water to bees particularly when the plant is young during spring. This pesticide exposure route has already been identified and may be fatal to bees.⁸
- ❑ **To assess pesticide fate in the colony.** This will investigate the distribution of pesticides within the colony and its effects on the queen, workers, drones and larvae. The BBKA Research Fund supports research into the presence of pesticides in bee hives at the University of Keele.⁹
- ❑ **The need for a larval test,** i.e. the effects of pesticide on larvae. Larvae are subject to secondary pesticide exposure from contaminated brood food.
- ❑ **To develop a test for chronic feeding study.** This is very important as it relates to long-term and cumulative sub-lethal doses. Sub-lethal doses can make bees more susceptible to infection. For example, Pettis *et al* (2011) identified a link between low level pesticide exposure and increased levels of *Nosema* in bees.¹⁰
- ❑ **To develop a test to assess pesticide effects on foraging behaviour.** This is a very important aspect. For example, Yang *et al* (2008)¹¹ demonstrated that sub-lethal doses of imidacloprid to bees increased the time interval between consecutive visits to the same feeding site.
- ❑ **To conduct research on the impact of pesticides on a community- or landscape-scale.** The impacts were not identified, but would include soil and water contamination.

Discussion

The workshop summary admits that 'no globally harmonized, tiered

testing system exists for honey bees',¹ nor is there a test that 'addresses chronic toxicity to adult bees or larvae'.¹ In particular, it also states that 'the methodology and testing scheme employed for foliar application products ... is not adapted to assess potential hazard and risk from systemic pesticides'.¹

From a beekeeper's viewpoint, it is surprising that such important research on systemic insecticides is still needed ten years after approval for use. The research projects identified suggest that bees are more sensitive to neonicotinoid residues than previously estimated, and/or the residues are more toxic than expected.

The workshop research recommendations appear to be at an early stage of development and there is no timescale for completion. However, it was noted that the European and Mediterranean Plant Protection Organisation (EPPO) has recently put forward a risk assessment for systemic compounds, with further work being undertaken.¹

The impact of pesticides on the landscape- and community-scale should include the monitoring of neonicotinoids in soil and water. The US Environmental Protection Agency (EPA) clearly stated that clothianidin is '...persistent and mobile, stable to hydrolysis, and has potential to leach to ground water, as well as runoff to surface waters. The high persistence of clothianidin (aerobic soil metabolism and terrestrial field dissipation half-lives ranging from half a year to several years) would cause accumulation of the chemical in soils with repeated uses'.¹² This is a major problem in The Netherlands. Tennekes (2010) listed twenty-six locations with imidacloprid concentrations in surface water between 16 and 4,776 times the maximum acceptable limits of 67ng/l.⁶ Furthermore, Krupke et al (2012) found high levels of clothianidin and thiamethoxam in the soil of fields planted with treated maize seed.¹³

Finally, the use of risk mitigation to protect bees from exposure to systemic insecticide residues appears to be non-existent. The workshop summary states that '...communication and cooperation among growers, applicators and beekeepers is perhaps the most important tool to reduce risk and ensure that the needs of all parties are met'.¹ The establishment of a common platform for incident reporting is proposed, but only between regulatory authorities.¹ The *Code of practice for using plant protection products*, published by the Department for Environment, Food and Rural Affairs omits any reference to mitigation in respect of systemic pesticides (DEFRA 2006).¹⁴

Conclusion and a proposal

Given the potential for the exposure of bees to systemic insecticide residues and the absence of mitigation for this risk, the sowing of seed coated with systemic pesticide ought to require reporting, in a similar manner to the spraying of foliar products. This should include, for example, the proposed date of sowing, the crop, the expected flowering period and life of the plant and the coordinates of the fields in which it was sown.

This information could be made available online by the appropriate UK regulatory authority, e.g. The Food and Environment Research Agency (Fera), who publish *Pesticides usage statistics*.⁴ If beekeepers had access to this information it would allow them the choice of leaving their colonies within flying distance of systemic treated crops or moving them further away.

This is a reasonable request, and one anticipated by the workshop participants: 'Growers and beekeepers engage in

reciprocal endeavours; it is therefore to the advantage of each to anticipate the concerns of the other. Cooperation and understanding of one another's needs is essential'.¹ It might also allay the concerns that some beekeepers have regarding neonicotinoid insecticides. I therefore call on Dera and Fera to implement such a reporting strategy in line with their obligations to mitigate the risks associated with the use of systemic pesticides.

John Hoar, Fareham BKA

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Making the Most of the Sun

In January's *BBKA News* I outlined the construction of a small simple and a larger, more complex solar extractor. Whichever you use, knowing something about the factors influencing the amount of solar energy reaching the extractor glass (insolation) is useful. Why? Because you can approximate wax output, you can plan wax extraction better, you can reduce unnecessary extractor deterioration and you can avoid unnecessary messing about! As insolation levels are not high in the UK and also vary from north to south, for example, on average London receives 19.6% more solar radiation than Edinburgh; we need to make the most of the sun we get!

Factors affecting solar heating

The main things that reduce the heating of a solar extractor are shade, the angle that the sun strikes the glass, the air mass and water content that the sun's rays travel through to reach the extractor. Also, as the insulation of our solar extractor is not 100% efficient, low air temperatures can cause heat to be lost from our extractor.

“ *Small amounts of wax may be purified in a small, well made, extractor, pointed at the midday sun in summer. For large amounts use a well-insulated extractor that can be adjusted to face the sun depending upon its position and elevation.* ”

At our latitude (approx. 50°–59°N) we get significant cloud cover; obviously less in summer and more in winter. Cloud shade slows or stops a solar extractor working, not only when the cloud casts a shadow but for a period after that when the extractor has to warm up again. We cannot alter clouds, but trees, hedges or buildings also produce shadows so we should try to pick a place where our solar extractor is not affected by these; preferably pick a place where the maximum sunshine falls at 'noon' i.e. about 12 pm in Nov–March (not recommended for extraction) or 1 pm in April–Oct.

Choosing a site for a solar extractor

The maximum insolation available to our extractor, and therefore its heating effect, is when its glass is perpendicular (at 90°) to the sun's rays. As the sun moves away from the perpendicular its heating effect is reduced (insolation reduction = 1 minus the cosine of the angle of incidence). The interception is reduced to 50% when the sun is 60° away from the perpendicular. However, 20° either side (70°–110°) from the perpendicular of the plane of the glass

we only lose a maximum of 6% of the incoming radiation. This affects our energy capture not only between sunrise and sunset but also at different times of the year.

Put simply, for a south facing extractor when the sun rises there is an increase in insolation towards solar noon, and then a decrease as it starts to move lower to the west. We could face our extractor at the rising or setting sun but there would not be enough radiant energy to melt our beeswax because at these low sun angles the radiation passes through a large air mass which reduces the amount striking the extractor glass. We all appreciate that the sun is 'higher' in the sky in summer than winter. This means that looking south at solar noon the sun's elevation increases from midwinter to midsummer then decreases towards midwinter again. By the same rationale outlined above, this changes the angle that the sun strikes the extractor glass if we do not move the glass, and so changes the interception of the sun's radiant energy. If the angle of our extractor is perpendicular to the sun's rays in April it will not be perpendicular in August so the extractor heating in April and August will be different. Also at sunrise and sunset the low angle of the sun earlier and later in the year causes the sun's rays to travel through a greater air mass reducing the radiant energy reaching the extractor.

The bottom line

So where does that leave us? The extremes are these; if you want to purify occasional small amounts of wax — a small extractor, well made but not left all the time in a damp shady corner of the garden, may suffice, but point it at the midday sun when in use in the summer. However, if you want a reasonable amount of wax, in a short time, from a large extractor at a certain time of year take a deep breath and read on!

It is obvious from the above that the angle of the extractor to the sun and the height of the sun above the horizon can have a profound effect of the collection of radiant energy. On a clear day in early morning and late afternoon we receive considerably less radiant energy than at noon and I have found that at these times my solar extractor doesn't work even when facing the sun directly. 10am to 2pm is a good operational time and for me there is little point in moving my extractor outside of these times as the extractor has been well insulated and

has a good double-glazed front. However, if it is a very clear warm day in late August, I sometimes track the sun with the extractor until about 3 pm. By this time, in my garden, the sun is about to go behind a tree! Unless you have a deep container for your wax, moving an efficient extractor has the risk of spilling liquid wax inside it.

Table 1. Recommended extractor angles at a mid-UK latitude

Month	Angle (degrees)
Jan	14.5
Feb	22.5
Mar	33
Apr	44.5
May	53
Jun	56
Jul	53
Aug	44.5
Sep	33
Oct	22.5
Nov	14.5
Dec	11

If you set an extractor at the maximum elevation of the sun at noon then it follows that for most of the time (before and after solar noon) it will be set too high. Table 1 gives suggested angles to set a solar extractor at the 'mid-UK' latitude (53° 74'). The angles in the table are based on the average between the sun's maximum elevation and its elevation at 10am and 2pm on the 21st of the month. This table lets you set an extractor at the best angle at the particular time of year. As I want to extract towards the end of August the glass of my extractor is set at about 44° and facing south. For this a plumb line and protractor stuck on the extractor can be used. Your best



Protractor and plumb line gives the angle of the extractor. Photo by Dr Chris Coulson.

extraction angle depends on when you want to extract and may be influenced by your particular location but by experimentation you should find the best compromise. For fine tuning of your extractor angle curves of solar azimuth (east-west orientation) and elevation can be found on the internet though Table 1 should be useful. Happy extracting and long may your wax flow!

Acknowledgement

Thanks to Jo Melville (Burton BKA) for some graphs required for this work.

Dr Chris Coulson, Beverley BKA

The Future of Biological Controls in a Bee Hive

The debate over the efficacy and safety of biological controls in agriculture has been around for a while, this also being one of the oldest methods of controlling horticultural pests. Their value diminished as farm size increased and pesticide application became a cheaper and easier method of large-scale pest control. But what do biological controls have to offer bee colonies?

Bacteria, fungi, mites, arachnids and worms

Bees, like all organisms, have natural foes, but it is also important to remember that these foes have enemies themselves, and so the saying 'the enemy of my enemy is my friend' may well apply to the beekeeper. Some biological control products are already commonly used worldwide, such as Certan (B401) for the prevention of wax moth infestation. This is based on a concentrated solution of *Bacillus thuringiensis*, a bacterium, which kills young wax moth larvae, but causes no harm to bees.



A thorough inspection of the hive will reveal the presence of pests. Photo by David Wootton.

Varroa destructor is the parasite at the top of most beekeepers' 'kill list', and exploring the options in its control has opened up some very interesting possibilities. The most widely publicised idea was to use a fungus, *Metarhizium*, to reside in the hive killing varroa, but not the bees. Providing a commercial fungal product for beekeepers has proved problematic; with proud housekeeping bees tear down the fungus. So what other options are there?

There are mites that eat other mites! *Hypoaspis miles*, a predator mite, that feeds exclusively on mites, is indigenous to the UK and mainland Europe and has been used for years in commercial horticulture, and more recently with poultry, pet birds, reptiles and tarantulas to control mite problems. It has also recently been shown to consume varroa happily. These mites do not cause any harm to bees or leave any residues.

Then there are pseudoscorpions! Now most of us would stay far away from anything with the word scorpion in it. But these little arachnids, commonly known as 'chelifers', about half the size of a thumb nail have been shown to live in bee hives and even travel with bee colonies, feeding on decrepit or dead bees and other arthropods in the hive such as varroa. This provides a 'cleaning symbiosis' between 'chelifers' and bees.

Other potential threats to bees, such as small hive beetles may also have enemies that may be beneficial to beekeepers. Soil infesting nematodes, *Steinernema riobrave* and *Heterorhabditis indica* have both been shown to kill small hive beetle (Ellis et al, 2010).¹

In the USA fire ants have been used in areas with endemic beetle infestations. The problem with these controls is effective management of the predators. It is also important to ensure that they are indigenous.

“Bacteria, fungi, mites, arachnids and worms ... could the enemy of my bees' enemy be ... the beekeepers' friend? „

So when it comes to biological controls for bee pathogens the possibilities seem quite endless. These controls may offer beekeepers the ability to use less or no anti-parasitic treatment, which often can have a detrimental effect on the bees and their honey. Managing bee colonies biologically to create positive symbiotic relations with the bees and other organisms may be the way towards more successful beekeeping.

For more information on this please visit our website: www.bee-vet.co.uk

Jon Arul, Bee Vets

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Going Wild: Managing Plant Pests

Remember the 1950's? It was an era of euphoric victory, the birth of television broadcasting as we know it and emergence of advertising as a major commercial tool. Famous British Rail posters spring to mind — sunny wildflower meadows and children skipping in holiday destinations. Behind this façade was the boom in industrialised, intensive farming — monoculture — whose aim was high yields, and the 'growing' market garden business, using the then exciting new tools of machinery and chemicals. This was the advent of 'perfect fruit and vegetables' (not a blemish or nibble in sight) and gradually we were led to believe that these unrealistically perfect examples were what we should expect. And, through clever advertising, we bought it, and demanded them. It was big business.

The soil food web

In a healthy soil, there is an incredible array of microorganisms which carry out some of the most important functions on this planet, such as fixing nitrogen from the atmosphere, providing food and making nutrients available to plants — this is the 'soil food web'. The constituent parts are:

- ❑ Bacteria (beneficial) — break down organic matter, fix nitrogen and feed plant roots.
- ❑ Protozoa — eat bacteria and are food for insects, releasing more nitrogen.
- ❑ Mycorrhizal fungi — break down resistant organic matter, maintain soil structure and have a symbiotic relationship with 90% of plants by supplying them with phosphorous from the soil.
- ❑ Nematodes (beneficial types) — feed on bacteria and fungi, and predate on other, less beneficial plant-parasitic-nematodes.



Monarch caterpillar eating swan plant leaf. Photo courtesy of Pseudopanax under the Wikipedia creative commons attribution license agreement.

Put aside for a moment the dramatic loss of farmland birds as a direct result of insecticide use. More insidious still applying pesticides (which are composed of chemical salts) to the soil also destroys beneficial bacteria which support life at the very base of our food chain. The consequence? Dependency on chemical fertilizer and yet more pesticide use; a vicious downward spiral.

The original model displaced by modern farming

Bees, other insects and plants coexisted on earth for over 100 million years in an evolving, burgeoning, self-righting ecosystem; later on supporting reptiles and eventually, mammals. The plant-eating animals were kept in check by meat-eating animals, just as today aphids are kept in check by ladybirds, hoverflies, lacewings and wasps, while slugs and snails are kept in check by hedgehogs, slow worms and birds etc. If an animal loses its food source, it becomes extinct. So we can arrive at the understanding that such 'pests' are an indispensable part of a balanced ecosystem.

Sometimes, we throw the ecosystem out of kilter by importing foreign pests who have no predator in our country (a prime example must be the varroa mite) and their control is justified, but maybe more effective control will eventually come in the form of predatory mites, which do not harm bees.

A natural model for today

'Prevention is better than cure' is a sound maxim and this applies

to plants just as much as to bees or people. Some progressive current thinking in raising healthy plants sits quite comfortably with the Spartans' treatment of babies who were exposed overnight on a hillside as a test of strength. If baby plants are not 'molly-coddled', not over-fed they grow slowly, their tissue being tougher and more resilient to pest attack. Similarly, if they are exposed to the natural world of bacteria and fungi they tend to develop a strong immune system; those that survive will be strong plants.

Hybridised plants are less resilient to disease than their wild ancestors. It is similar in the whole living world. The addiction to 'altered' plants is not doing us or the environment any favours, since they will be likely to depend on more pesticides. Moreover, some plants have been altered without consideration to bees or other wildlife, by breeding out nectaries, or making them unpalatable to birds. We can only know for certain that unadulterated 'species' or wild plants are perfect for pollinators. The only plants we can justify hybridising are tried-and-tested fruit and vegetable cultivars that improve quantity or quality of our food, yet still being 'open-pollinated'. Ornamentals which are sterile, hybridised clones provide nothing for wildlife or their own species.

Organic control to the rescue

A big, resounding 'however'! There are times when we do not want our broad beans swamped by black-fly, or our kale gobbled by cabbage white caterpillars; we do sometimes need help (PDQ). There is now a huge selection of organically acceptable products including:

- ❑ Fatty acids insecticidal soap is effective against aphids, white-fly, red spider-mite
- ❑ Seaweed extract boosts plants' natural immunity
- ❑ Yellow sticky traps attract white and sciarid-fly to non-toxic glue
- ❑ Potassium bicarbonate for powdery and downy mildew or black-spot
- ❑ Sulphur for powdery mildew, also acidifies soil.
- ❑ Ferric phosphate is a slug and snail killer, non-toxic to everything else (though I do not use this; I make sure I plant plugs which are large enough to sustain slug attacks).
- ❑ Biological control. An array of living organisms which provide help to control outbreaks and often used in commercial tunnels, though in my experience, not as effective as native garden insects.
- ❑ Physical barriers. Nets, prevent carrot root-fly or cabbage white butterflies landing.

One caveat

Pyrethrum, an organic insecticide, made from flowers of Chrysanthemum, is effective against most pests, and is toxic to bees, but does not persist in the environment. If you are going to use this do so with care; do not spray during the day and do not spray onto flowers.



Sarah Holdsworth,
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Swarming Bees are Healthy Bees

Bees swarm to reproduce and spread their genes. Healthy offspring are best produced in optimum conditions of temperature and nutrition and with a vigorous parent colony. However, like other organisms, bees will be instinctively driven to reproduce more when they are subjected to stress, danger and threatened survival.

Beekeepers are constantly being directed to control swarming at all costs, whether to improve honey harvests or reduce nuisance to neighbours. I have been wondering if a century of increasing control over honey bees' basic natural function has had an adverse impact on the health of our bees. In this article I have considered the bee's reproductive process in a natural environment to see how it benefits a colony, as well as the impact of swarm control husbandry.

Swarm preparation phase

During springtime, a colony will build up rapidly, increasing its stores, brood and adult bees. The colony maintains its brood nest temperature at 35–36°C, the optimum for rearing healthy brood. By late April or early May a healthy colony will reach a state of affluence, which will enable it to swarm.

Many beekeepers start swarm prevention inspection in March at temperatures as low as 11°C. This regular hive opening breaks open propolis and wax seals; releases heat and volatile compounds from the nest and disrupts thousands of worker tasks. The result is a stressed colony, forced to do unnecessary work and with a brood temperature below the optimum. This brood cooling can contribute to European Foul Brood (EFB).¹ The reduced nest temperature also favours *Varroa*, which has an optimum brood temperature of 33°C; enabling the colony to maintain a nest temperature of 35°C works against *Varroa*.²

Varroa and other pathogens will thrive in fatigued and weakened colonies. To keep colonies alive beekeepers are using chemical varroacides and medications. These substances, even the organic acids and thymol, are toxic and harmful to bees.^{3,4}

A colony will raise as many drones as it considers necessary. Often beekeepers cull drones as unproductive honey consumers. They also use drone brood as expendable varroa traps. This reduction of the drone population has an adverse effect on the quality of queen mating. It also consumes significant resources as the colony strives to replace essential males in time for mating.

The swarm of bees has to find a new home, build comb, stock it with stores and feed new brood. This requires bees of different ages and gland development and will not include many old foragers. An artificial swarm, which merely separates the queen and flying bees from the house-bees and brood, risks having old spent bees by the time new brood hatches out and requires feeding.

The colony raises a number of queen cells in specially constructed round cells. Queen cells are given special treatment; they are visited ten times more often than worker bee cells during the 3–5 day larval stage to ensure the optimum development of

new queens, which become almost double the weight of worker bees. Queens raised artificially from two-day-old larvae will receive less nourishment and care.

In an unstressed colony the queen brood survival rate can be as low as 53% from egg to adult; 33% in a stressed colony.⁵ The colony appears to be weeding out substandard queens during development. During artificial swarm manipulation, when we destroy unwanted queen-cells, how do we know we have selected the best two larvae? What are the chances they will fail or produce substandard queens, resulting in a queen-less or a poorly performing colony?

The swarm cluster

On leaving the nest, the swarm pours out of the hive or nest cavity and mills around before settling in a cluster on a nearby bush, tree or structure. Hundreds of forager bees become scouts and seek cavities suitable for a new home. Instinctively they know what constitutes a good cavity. After assessing a site, each scout returns to the cluster and conveys its information to the cluster-bees in a waggle dance. After considering different waggle dances and checking the sites, the bees eventually reach agreement about a site and the scouts lead the swarm-bees to the new cavity. This reconnaissance, communication and consensus-reaching is an important part of the bee's metabolism, decision-making and intelligence development. The new site is most probably 300–500 metres from the home nest.^{6,7}

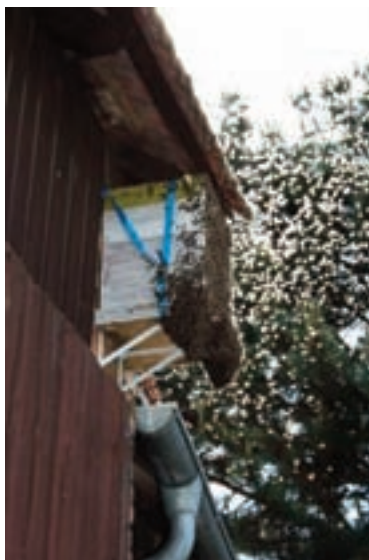
This has the benefits of reducing competition for forage as well as reducing the risks of transfer of pathogens by drifting or robbing. Fries and Camazine suggest⁸ that inter-colony transmission of pathogens by swarming will result in a benign host-parasite relationship, but the horizontal transfer of pathogens from one colony to another by drifting, robbing and comb exchange will result in more virulence. The high colony density in large apiaries and the 'splitting' of colonies to achieve increase will

favour pathogen virulence.

Building the new nest

At the new site, bees make the cavity draught-proof with propolis and start making wax. Bees construct honeycomb and forage for stores; both are needed before brood rearing can commence. A coating of antibacterial, antifungal propolis is applied to the cavity. Temperatures of up to 40°C are required to make comb⁹ and the nest temperature will have to be maintained at 35°C for brood rearing. The swarm will be broodless during the nest building period. *Varroa* will have no uncapped brood cells in which to hide, and develop. They will be exposed to grooming by bees and fall to the bottom of the cavity, far from the comb.

While the new nest is being constructed, stores collected and brood started, the swarm is vulnerable to conditions of poor weather, poor forage and predators. Seeley⁶ considers that about three quarters of new swarms fail. Beekeepers reduce this vulnerability by providing suitable nest sites and emergency feeding to prevent starvation, often using sugar. Sugar is a poor



Swarm arrival. Photo by Bernhart Ruso.

substitute for nutritious honey¹⁰; brood reared on poor nutrition will not achieve optimum development and immunocompetence will be reduced.

The home nest

The original nest is reduced by a queen, about half of its adult bees and some of the honey stores. It still has virgin queen cells, developing brood, an extant nest structure and good stocks of stores. It is quite wealthy but will not be so if beekeeper manipulation denudes it of nurse bees and honey stores.



Swarm moving up into brood box. Photo by John Haverson.

The first virgin queen could emerge eight days after the swarm departure. Other brood will have hatched. The queen will take time to mature and mate. Her egg laying may not commence for three or four weeks after the swarm departs, depending on weather conditions. Again a broodless period will work against varroa. The collection of pollen and increased foraging will indicate when brood rearing commences. Constant hive opening to check for eggs is highly disruptive to a new and developing nest.

The first virgin queen may be allowed to kill her siblings, but if the mother colony is strong and conditions are favourable, the workers may protect some virgin queens so the colony can produce secondary swarms, to spread its genes.

On the mating flights, colonies escort valuable virgin queens providing a 'herring shoal' protection effect against bird predators. Large escorts ensure successful returns whereas smaller escorts from mini-colonies, favoured in artificial breeding, suffer queen losses of some 33%.⁹ On the mating flight a vigorous queen will require a good drone to catch her. Poor queens will be caught by good males but can also be caught by poor drones increasing the chances of low grade offspring.

Local bees will be genetically conditioned to the local environment. In UK this can be cool, wet weather during the swarming season. Local bees will be able to cope with inclement weather and achieve successful mating when exotic bees from warmer climates may not. The natural mating with up to 20 drones will ensure genetic diversity, essential to species survival. Nature will select for characteristics to enable survival in its environment and against pathogens. These will not necessarily be the docility, productivity and non-swarming sought by beekeepers.



Swarm hanging in a tree. Photo by scf courtesy of Vita-europe.

Afterword

The entire swarming process brings into play a huge array of diverse behaviours affected by natural selection. The colonies that survive the dangerous adventure of swarming will, on the whole, be the fittest. If we short-circuit this fundamental behavioural feature of the honey bee, we reduce the opportunity for nature to hone the fitness of the bee population.

There is growing anecdotal and scientific evidence^{11,12} that wild bees are surviving and coping with varroa. It is clear to me, that the ability to swarm naturally is a significant factor in their survival. I believe we should be considering how we might better manage swarming to make use of its colony health benefits; perhaps using bait hives and informed, non-intrusive 'reading' of colony activity.¹³ This might reduce honey harvests, but there would be more bees. Man can live without honey, but not without bees.

John Haverson, Hampshire BKA

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Surveying the Levels of Pesticides within UK Apiaries

Firstly I would like to thank all those individuals and beekeeping associations who agreed to take part in our study to survey the levels of pesticides within UK apiaries. I would also like to thank Dr C Connolly (Dundee University) for his efforts in recruiting Scottish participants. There was a great response from UK beekeepers with over 150 wax samples being received for chemical analysis. The analysis involved a two-step extraction process to remove pesticides from the wax, before being analysed using gas chromatography-mass spectroscopy (GC-MS). Unforeseen delays have meant, however, that returning individual sample results has been slower than anticipated. These issues have now been rectified for future studies.

The results so far look promising and indicate that beekeepers need not be worried about cocktails of pesticides in high levels within comb wax. However, all individual samples will be reviewed further to ensure that nothing has been overlooked. I hope to report on the work conducted a later issue of *BBKA News*.

The next stage of the project aims to have a number of 'pre-screened' foundation wax frames within various bee hives around the UK; the purpose of this is to monitor any possible accumulation of pesticides at various stages over the next two to three years.

Kristopher Wisniewski



Keele researchers at work: Kristopher Wisniewski is by the hive (above) and Richard Bridgett (below) is in the lab.

Improving Honey Bee Health by Enhancing the Palatability of Food Supplements

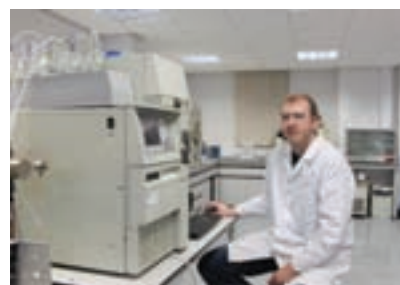
Supplementary or substitute pollen diets often suffer from poor acceptability unless amounts of natural pollen or pollen extract are included. Various studies present evidence that pollens contain additional phagostimulants (feeding stimulants), but little is known either about their number or identity. Funding from both the Perry Foundation and BBKA is being used to investigate whether any of these stimulants can be isolated and identified. Achieving this may enable more palatable protein-rich supplemental bee diets to be developed. Encouraging initial chemical analysis (May–Dec 2011) of trapped and hive stored ('bee bread') pollen samples, extracted with numerous solvents, has confirmed the extraction of a range of expected compound classes which exhibit segregation between solvents. Attempts to separate these within each extraction solvent are ongoing, with initially positive results.

April 2012 saw the project shift focus towards investigating what phagostimulatory effect certain compounds within these extracts have on colonies of *Apis mellifera*. This is being tested via a series of feeding trials. Previously conducted US studies have shown that different whole solvent extracts of trapped corbicular pollens initiate different levels of feeding within colonies. This work will, through a series of trials, attempt to isolate and conclusively identify specific compounds responsible; activities of corbicular pollens and 'bee bread' samples will be compared.

We are using 'choice' trials whereby colonies are provided with multiple test diets within the hive. An adapted formulation of a homemade pollen supplement recipe is being used as both a negative control diet and a substrate diet within which test extracts may be delivered. Initial trials are delivering whole extracts to colonies and monitoring honey bee preference through diet uptake over time. Highly active extracts will be subjected to separation (fractionation) before each fraction is tested again in a similar fashion. Through a series of successive cycles the aim is to isolate particularly active fractions and ultimately individual compounds for identification. Incorporating both corbicular pollen and 'bee bread' samples obtained from the same geographical location in the study will additionally facilitate complimentary work examining whether bee processing of foraged pollen may affect its palatability as bee bread. Data gathered here could potentially indicate whether any identified phagostimulatory compounds are added or increased as a result of bees' pollen processing behaviour.

I would like to thank both the BBKA Technical Committee and members of the South Cheshire BKA for their active participation in the project.

Richard Bridgett



For more information on either project, or should you wish to participate in any way, please feel free to contact us directly in the following ways: k.d.wisniewski@epsam.keele.ac.uk (01782 733506) and r.j.bridgett@epsam.keele.ac.uk (01782 733942).



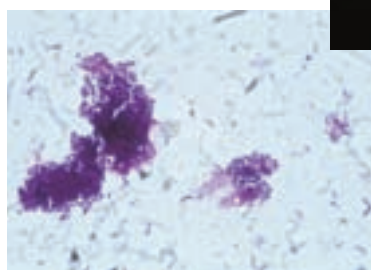
Biology and Spread of European Foul Brood: Some Preliminary Results

European foul brood (EFB) of honey bees is arguably the most important brood disease of honey bees in the UK, and is caused by the bacterium *Melissococcus plutonius*. It is far more common than the other bacterial disease of honey bees, American foul brood (AFB); in 2011 there were 366 cases of EFB in Great Britain, compared with fifty cases of AFB. On top of that its symptoms are probably more serious for a hive than other brood disorders like Chalkbrood, caused by the fungus *Ascosphaera apis*. I have written in *BBKA News* in February 2011 and October of the same year about my PhD project, in which I am trying to understand the biology and spread of EFB. Here I will give a brief update about my most recent progress.

Bioinformatics

Most of my recent work has been in bioinformatics; the use of sophisticated computer software to analyse DNA sequences. My main aim has been to arrange our identified sequence sections of the *M. plutonius* type strain genome into the correct order (the type strain genome being the complete DNA sequence found in the first strain of this bacterium). This task is proving a lot more complicated than envisaged, as we now have identified large sections of DNA whose internal sequence we are confident about, but we are not completely certain in what order these large sections are arranged.

Despite not being completely finalised this genome sequence has been very valuable for other investigations into the biology of *M. plutonius*. For example, some work I did a while ago on the comparative metabolism of *M. plutonius* and another bacterium has been taken forward by undergraduate and Masters students in my laboratory at the university. This research has the potential to produce insights into how the bacterium is able to survive and thrive inside a honey bee larva. In addition to looking at the type strain genome I



Melissococcus plutonius.

Another aspect of my work with DNA sequences has been identifying genes that have slightly different sequences of DNA letters in different samples of *Melissococcus*. Knowing this will allow us to differentiate between strains of the bacterium. This work has been going on for some time now and I am gradually moving towards a scheme I am happy with. As with any scheme the amount of variation that I can detect is fundamentally limited by the variation present within the species.

In *M. plutonius* there are not huge differences between isolates, but I do seem able to pick out trends from isolates from different countries. This is something I hope to confirm with more samples from a broader geographical range.

Apiary epidemiological investigations

In terms of working out some of the ways that EFB spreads around, my work has not solely been limited to making inferences from sequence data. I have taken samples (and had samples sent to me) from several case study apiaries from the Midlands and the north of England. The samples taken covered all the possible sources of EFB infection we could think of; soil, water, wild pollinators, bees from the apiaries, as well as swabs from all sorts of structures and equipment at the sites.

These samples were sent to Fera where I subdivided them; one portion of each sample was preserved to keep any bacteria present alive and the other portion had all the DNA present



EFB-twisted and discoloured larvae. All photos supplied courtesy of The Food and Environment Research Agency (Fera), Crown Copyright.



EFB scale.

extracted. This DNA was then tested for sequences that were specific to *M. plutonius*. DNA from the EFB pathogen has been found on a range of equipment and in several samples of insects, and these provisional results will inform my sampling strategy for the coming beekeeping season.

Future directions

I am now in the third year of my PhD and this coming beekeeping season will be the last I take samples from. One of the most important things now is to have a clear idea of what aspect of the work from last year I want to investigate further, and how I need to go about this in order to make the results rigorous and defensible. Other avenues of work will be the completion of the typing scheme, the finalisation of our genome sequence, and analysis of the data generated.

Acknowledgements

My work is funded by a BBSRC CASE (Council for Advancement and Support of Education) studentship, in partnership with BDI (Bee Diseases Insurance). I am supervised by Dr Thorunn Helgason and Prof J Peter W Young (University of York), Dr Richard Thwaites and Dr Giles Budge (Fera), and Bernard Diaper (BDI). In addition, I would like to give thanks to the beekeepers and Bee Inspectors who have been an invaluable help with sample collection.

Edward Haynes, Fera and the University of York

First ever Congress of the French-speaking Apitherapy Society

This event was organised on 21–22 January 2012 as a result of a close collaboration between AFA (Association Francophone d'Apithérapie) and UNAF — the French equivalent of BBKA. It was given tremendous support by the city of Lille, which provided an excellent venue and facilitated every aspect of the conference. Like another fifty cities or districts in France, Lille has vowed to support bees, with a strong emphasis on urban beekeeping (beehives have been kept on the Lille opera roof since 2007). Eminent speakers included medical doctors, surgeons and research scientists, attracting some 150 delegates from all over France, Belgium, Switzerland and further afield. The audience included not only beekeepers, but 20% practitioners from the medical professions and a dozen students involved in scientific research.

Apitherapy: medical applications

A handful of hospitals in Europe already use apitherapy, particularly in the field of wound treatment, a practice which is well recognised. AFA's main objective is to introduce scientific rigour to apitherapy with a view to regulating processes, extend its activity and ultimately concentrate on prevention rather than cure.

Henri Clément, president of UNAF, opened the conference by emphasising the links between the need for better education and sound beekeeping practices at all levels, particularly in the context of our modern world with its use of pollutants such as insecticides. He was followed by Dr Albert Becker, President of AFA and a GP who actively practices Apitherapy. Dr Becker's presentation on the use of honey on wounds had the audience riveted. A hard act to follow, which didn't deter the next speaker, Patrice Percie du Sert, an agricultural engineer and professional beekeeper, who illustrated the virtues of fresh pollen as well as presenting research that demonstrates the probiotic action of bee-collected pollen on *Salmonella*.

Maintaining quality is essential

Nicolas Cardinault, a specialist in human nutrition, presented papers on the quality standards required for the use of propolis and on research which has been carried out on the anti-cancer activities of propolis. Both *in vitro* tests and studies on mice have demonstrated potential benefits of using propolis in the treatment of cancer tumours, as well as highlighting the added benefits it can bring to healthy cells, in particular liver and heart cells.

Patrice Percie du Sert gave detailed explanations on how propolis for medical use should be produced and harvested while Alain Bekaert (lecturer in pharmacy at Paris University) reported extensively on the active ingredients found in propolis and their potential uses. Meanwhile, the delegates were treated by Henri Joyeux, professor in oncology and digestive surgery at Montpellier University, to a fascinating yet entertaining exposé on the value of using all the products from the hive in human medicine.

Dr Stefan Stangaciu from Romania is the top-most authority on apitherapy and he gave an account of the use of bee venom therapy and its role in the treatment of a wide-ranging list of conditions such as MS, wounds and heart conditions. This was complemented by an exposé on desensitisation for allergy sufferers

by Dr Claude Nonotte-Varly, an allergy specialist who explored risk-factors and treatment methods. In his presentation, professor Eberhart Bengsch, a world expert on royal jelly from the Max Plank Institute in Munich, reported on the treatment of a large number of conditions (viral infections, osteoporosis, diabetes and mental illness to name but a few) using royal jelly.

Science helps protect the integrity of honey and other bee products

Dr Albert Becker explained how laboratory studies now enable the authorities to check honeys from all over the world for quality and authenticity, keeping one step ahead of fraudsters who would otherwise compromise what remains man's best ally from nature. A world 'honey library' is currently being developed to preserve data for future generations. Practical sessions on honey massage, digipuncture [French for acupressure] and the preparation of cosmetics rounded up a pleasant and tremendously informative weekend.

Watch out for the next event: an international congress on apitherapy, to be held in the south of France in October 2012. Details will be announced on <http://apitherapiefrancophone.com/>



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Learning from Others: Stroud Buzzclub

Stroud BKA get a real buzz from thinking outside of the box. Intrigued? Then read on.

Four years ago the Stroud BKA (SBKA) was a small local group with around twenty members or so. We were happy but we did not have a satisfactory site for our apiary; we had a low local profile and we were not really setting the beekeeping world on fire or helping to secure the future of beekeeping in the district.

As the national profile of beekeeping took off and as our membership doubled, the committee worked hard and found a new apiary site at the local convent. Unfortunately although beekeeping was on the up, the popularity of living in a convent was taking a nosedive and at the end of 2010 our convent closed down leaving us with a real and pressing problem. This was especially challenging as we had by then successfully tapped into the local interest in beekeeping and developed a very popular training programme for new beekeepers, which meant we needed a good apiary site to help us manage the flood of new beekeepers.

Bees, beekeepers and a Buzzclub for juniors

By using our developing local networks a novel opportunity presented itself and we were offered the chance to re-site our apiary in the playing field of the local St Dominic's Primary School. At the time this was felt by some to be a bold, even foolhardy, choice of site, but our committee saw the potential of uniting a range of needs, aspirations and opportunities. After a presentation explaining the benefits and following satisfactory risk assessments it was agreed by the school governors that we could use part of the field for our apiary, and alongside it the school would develop a nature centre. Combined, all parties saw that this would create an educational centre that embraced all ages.



The school governors and the SBKA committee both signed up to the vision and this ensured that the numerous hurdles to be crossed were seen as challenges on the way to success rather than as insurmountable problems. Appropriately enough, the agreed rent for siting the apiary in the school field was a super full of honey and this led to helping deliver the next stage of the vision.

Soon after the school summer holiday our chairman extracted the honey at the school with all the children. What a buzz that created! The honey was bottled by the children and for days afterwards the children were talking about their experience. They now wanted to start their own bee club. The local press reported these events and that led to a short film being shown on the local TV news. The children sold the honey that they had bottled at their Christmas bazaar and this raised nearly enough funds for four children-sized beekeepers' suits to be bought. A phone call to BBWear resulted in them sponsoring the children and supplying five suits for the price of four.

So what have been the tangible results of all this enthusiasm you might wonder? SBKA are forming a junior section and St Dominic's children have built a website aptly named Buzzclub. They are planning after-school apiary visits throughout the coming summer. Teachers have become enthused and used the opportunity to incorporate bees into their teaching across the curriculum.



Children at the bee hives in south Winchester (photographed with their parents' permission). Photos by Peter Lead.

From small beginnings opportunities flourish

Working with our local Gloucestershire Wildlife Trust we have jointly helped develop a bog garden, an orchard and an area protected to allow wildflowers to grow. Further planting of nectar-producing and pollen-bearing plants will take place in future, with most of this work carried out by members of the Buzzclub and their parents.

We have built a new training shed and are providing winter study courses for those wishing to take the basic beekeeping exam, and a new beekeepers' training course including ongoing training that provides a year's training at the apiary. Our membership has never been higher as we now have over one hundred members and our training programme is thriving.

What is so exciting from this whole opportunity is the huge enthusiasm that it has engendered in the pupils and their parents as well as helping link our current beekeepers with those of the future.

We have several events in the pipeline and these include a picnic with bees at the nature centre hosted by the Buzzclub as part of the Nailsworth Festival, 20 May 2–5pm and a three-day display of beekeeping at the 'Stroud on Water' festival in June.

For details of our comprehensive training courses and meetings visit our website www.stroudbeekeepers.co.uk

Peter Lead,
Stroud BKA

Notes from a Clifftop Apiary

Sliding the white board inspection tray out during the summer months I usually find, among other debris, small lumps of pollen which have fallen through the mesh floor. Collecting a few and putting them on my tongue produces a small powdery explosion of nutty flavours. This year, on 16 January, I saw white pollen being carried up a landing board. This would almost certainly have been pollen from the male hazel catkins, which is always the first to put out. At the other end of the flowering season, October and November, it's the pale orange of ivy. These, the first and the last pollen producers in the year, are easy to identify. Right now though, in May, the whole complex colour-range of summer pollens is arriving.

A few days after the white pollen sighting, 23 January to be precise — a windless day of clear blue-washed skies, with blinding sunlight flashing off a shining sea — the air felt mild enough to take the lids off the hives and do a quick check on stores. I don't like hefting. It's a very imprecise measuring practice; it usually means cracking sections like brood box and floor apart from each other. Sometimes it's brood box from super and, because you don't have a hand free to brush bees away, this always results in crushing those bees that immediately crawl into the opening. And can I tell what the poundage of stored food is in there, separate from the weight of the boxes? No, I can't. So, (another benefit of living in South Devon) opening up on a mild midday in January does no harm, and means I can quickly spot frames holding late-summer honey which the bees made after I had taken off the summer crop in early August. So that was alright then. It was yet another reminder that rural Devon, and the coastal margin, is a very fruitful region in which to keep bees. I could, if I wished, take two or even three honey crops during the course of a summer. As it is, I take honey off in August, and whatever the bees make after that they keep for winter. Which reduces the syrup feed.



There's a wooden five-bar gate at the roadside which leads to the village allotments. Whenever I take visitors to see the bee hives, I hear a sharp intake of breath at the gate. 'O M G, what a view!' Well, yes. And believe me, I spend a lot of time looking at it. A ruler-straight horizon. The wedge of Portland. The distant hills across the bay above Abbotsbury. And the infinite faces of the sea. I'm the only vertical gardener there. All the other allotmenters are bent backs. They're rootling among the rhubarb, fossicking among the flowerpots. I'm the only one standing. I watch waves travelling inshore, like curved ribs. I can hear the slap and rinse of small waves on the shingle beach far below. On vast blue windless days I stare out into sea-glitter. This is not time wasted. When I gave up full time work, my colleagues looked hard at me and said, 'But what are you going to do?' They, like me, had spent half a lifetime with their mind in next week, next month, and found it difficult to imagine a daily life drained of future-content. A life of conscious attention in the present moment. But that's all in the past, and here we are, it's Now time. And keeping bees only contributes to that. Zip the suit. Light the smoker. Select the tools. Pause by the hive and watch the bees. Then quietly open up the box, and quietly look in. Everything done consciously in Now. Deliberations rooted in the present. Quality time.



I am on the allotment and looking at brood frames when my mobile chirrups. A text from Wife. Whoosh u doomigini? I ring her. What is her message about, I ask? She says she is still trying to get the hang of predictive text on her new mobile. She wanted to ask, 'What are you doing?' 'But,' she adds, 'I don't want you to ring me, I want to do texting.'

'Why?'

'It's more fun.'

'But it's quite difficult to operate a mobile phone from inside a bee suit and wearing marigolds.'

'Well, I'd come home now anyway if I were you because your lunch will be cold.' When I get home I find lunch is quiche and salad. 'I thought you said I had to get home because of lunch getting cold.' 'Quite right. There it is. It's cold. It's a cold lunch. Are you complaining?'

I tell her I think I'll leave my mobile at home in future. 'No, you can't do that. You have to have it so you can call the ambulance.'

'Call the ambulance? Why?'

'For when the bees attack you and you have one of those naff electric shocks.'

Rowland Molony, East Devon BKA





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Abandoned Hives

As the finder of the long-abandoned apiary referred to in *BBKA News* in September and December 2011, I would like to assure readers that they really would not want to keep bees anywhere near an abandoned apiary site like the one I found. The discovery and subsequent investigation has highlighted various points that we should address as beekeepers. The following will be outlined here:

- ❑ Lack of information on how best to stop beekeeping activities
- ❑ Impact of untended apiaries
- ❑ Registration of all apiaries
- ❑ Prejudice toward and ignorance of the NBU's BeeBase
- ❑ Making provision for our bees
- ❑ Out of date legislation
- ❑ Beekeeping suppliers essential involvement.

Background

In autumn 2010 a power company cleared trees and undergrowth from an area located close to one of my out-apiaries. This allowed me to discover nine dead hives that were being actively investigated by scout bees. All the boxes and contents were safely disposed of by fire in two large pits in an adjacent field. The boxes were brittle with age and the contents chewed and contaminated by mice and pyrethroid strips. I had kept bees in the nearby apiary for six years and in the early years had European foul brood (the source was never identified) and reinvasions of varroa. Any new queens mated on site also showed poor traits in the resulting offspring.

Eight of the nine abandoned hives were branded boxes. The apiary appeared professionally laid out and this indicated to me that the hives had not been stolen and then dumped. Enquiries revealed that I was not the first to discover the apiary; a local man was called in to investigate a huge number of swarms during 1993–1994, which were plaguing locals. He was new to beekeeping and within eighteen months became allergic to bee stings and had to give up. This was shortly after he found the site and put pyrethroid strips into the hives. As he was totally overwhelmed by the situation and did not know what else to do, he abandoned the apiary to its own fate, once again.

Lack of information on stopping beekeeping

There is lots of information available about how to get into beekeeping and how to do beekeeping, but very little about an exit strategy and how to stop. Many books recommend not buying second-hand equipment when starting. This, by implication, means that selling or giving away boxes/equipment is not the done thing.

Impact of untended apiaries

We will all have to stop beekeeping at some point and we will all need an exit strategy to suit our own circumstances, but abandonment should not be one of them. With more people coming into beekeeping in recent years there is inevitably going to be a rise in people stopping. Allowing boxes to slowly rot in a corner of a field could be classed as criminal, (the beekeeping equivalent of fly tipping) and can constitute a potential bio-hazard.

Registration of all apiaries

Various beekeepers are rumoured to play 'hide-and-seek' with their hives/apiaries and the bee inspectors, and may not declare all of their sites on BeeBase. I would ask whether it is now time for the BBKA to grasp the nettle and make registering with the National Bee Unit compulsory rather than 'recommended'. As the threat of exotic

pests and diseases increase, any thought of control, for example, of small hive beetle, would be impossible. Forgotten and abandoned sites will get re-occupied by swarms once a colony has died out and may become reservoirs to any number of pests and diseases along with desirable and undesirable traits for a very long time (a good quality cedar hive has a life expectancy of 60–80 years!).

Prejudice toward and ignorance of BeeBase

Many beekeepers are against registering their apiary sites due to the idea that others will then steal their hives if the location is known and/or the tax man will be interested in their beekeeping. Both ideas are folly and unfounded and show prejudice and ignorance. This needs to be addressed at all levels in beekeeping.

Making provision for our bees

Abandonment incidents emphasise a need for registration of all apiary sites on BeeBase. This would not only make the bee inspectors' job easier, but abandoned apiaries would come to light at any follow-up inspections. Being registered on BeeBase is also a first step for making a provision should something untoward happen to you, preventing you from safely disposing of or handing on your apiaries. We should all make provision in our wills for our bees as they are both a dependant and an asset, or under certain circumstances, a liability. Our relatives and next of kin are not beekeepers (generally) and will not understand the importance of the safe disposal of our equipment and bees or the risks that may accompany an untended out-apiary. And they are unlikely to know where they all are, or their value.



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Out of date legislation

My concern is for the long-term survival of beekeeping. I have kept bees for twenty one years and beekeeping has changed beyond all recognition from when I started, because of just one pest: varroa. Registration and legislation is now long overdue for change if we



An abandoned hive (right) and its contents should be safely disposed of by fire in a fire pit (as exemplified above). Photos by Andy Willis.

want to avoid having the bee equivalent of the Foot and Mouth epidemic (due to an exotic pest invasion) when it was difficult to track animals who were potential carriers. Has the arrival of varroa not taught us this already? I feel that the BBKA should lobby for changes to legislation, before it is too late.

Beekeeping suppliers essential involvement

Not all beekeepers are members of an association and therefore

part of the BBKA. The suppliers of equipment play a big part in education and could help resolve or tackle some of the issues raised in this article, and thereby reach the widest possible target audience. Beekeeping suppliers have a vested interest in the successful continuance of beekeeping and have more to lose than most should beekeeping not survive as suggested by Lord Rooker.

Conclusion

Is it not time we brought beekeeping into the 21st century? The BBKA is perfectly placed to undertake the tasks necessary to address all of the points raised here. Large-scale beekeepers and beekeeping suppliers rely on beekeeping to earn their living; it is in their interests to work with us hobbyist beekeepers to save the future of beekeeping. We all need to take responsibility for beekeeping very seriously and recognise and implement changes that are now long overdue and needed. My regional bee inspector has asked district associations to change their constitutions so that membership names and addresses can be forwarded to him so he can contact those not yet registered on BeeBase. He has taken this idea from the Welsh BKA who have already implemented it. What we do as individual beekeepers we may be doing on our own, but it has far reaching and long term effects on others. No beekeeper is an island.

Andy Willis,

Southampton & District BKA



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Business Corner

Insect Pollinators Initiative: Your Help is Needed

There has been a great deal of publicity regarding the effects of agricultural pesticides on honey bees and these chemicals have been found to accumulate in honey bee colonies in the USA and Europe. In these studies, the presence of miticides within colonies has been recorded. This is unsurprising of course, but we do not have any field evidence as to what their consequences (if any) are to honey bee overwintering. To address this issue it will be necessary to first see if any miticide treatment correlates with an improved, or even worsened, overwintering success. This research project is part of the Insect Pollinators Initiative to study the effects of pesticides and miticides on bee health. Although this data may inform our future research direction, it is primarily intended to provide robust data to guide and reassure individual beekeepers in their decisions regarding the control of varroa mites. This data will be released to both the Scottish BA and the BBKA for dissemination among their members, possibly as a summary report.

Questionnaire:

Please email responses to c.n.connolly@dundee.ac.uk

Please use the subject heading: **OVERWINTERING SUCCESS**

1. **POSTCODE** for overwintering site (first part only required, e.g. SW1A, rather than SW1A 1AA);
2. **MITICIDE TREATMENT(S) USED** (between April 2011–March 2012);
3. **NUMBER OF COLONIES TREATED:**
4. **NUMBER OF COLONIES THAT SURVIVED THE WINTER:**
5. **NUMBER OF COLONIES THAT FAILED:**

Repeat questions 2–5 if some colonies had different treatments. Repeat 1–5 if you are reporting on another apiary from a different postcode area.

Please include all treatments, including icing sugar dusting, as well as chemical treatments for other purposes (e.g. Fumidil B), but not physical methods (e.g. drone brood uncapping).

Your name will not be included in any data sheet and I will not release your name or e-mail address to any other person or group. This survey is completely separate to the BBKA Winter Survival Survey which is used differently; once analysed the results from that are fed into the European COLOSS survey.

Dr Christopher Connolly,

Division of Neuroscience, University of Dundee

c.n.connolly@dundee.ac.uk

http://www.dundee.ac.uk/medschool/staff/chris_connolly

Diary of Events 2012

5 May. Meon Valley BKA. Bees and beekeeping equipment auction at The Greatham Village Hall, Liss, Hampshire. Entries to be received by 19 April. Details: Bruce Taylor 01489 895428 or Bruce.Taylor@tiscali.co.uk.

13 May. Yalding and District BKA – Honey Bee Fayre and Auction. Fayre opens 10am to 4:30pm, auction starts at 2:30pm. Free entry. More information: www.beefayre.yaldingbeekeepers.co.uk

7–9 June. Royal Cornwall Show, Wadebridge. Schedules available from Sheila Sleeman, 01872 863842.

A New Face at the Bee Farmers' Association

Margaret Ginman has been appointed as its first full-time General Secretary. Margaret is a journalist and business woman and has run her own engineering company for many years. She has just stepped down after twelve years on the Council of Management of Which? and fourteen years in consumer work in the water industry. Margaret is also an experienced beekeeper.



The BFA has further strengthened its management team with the appointment of David Bancalari as Research and Administration Officer. David, whose background is in banking and IT, has undertaken many roles at the BFA in the past and is a familiar face in the beekeeping world,

Margaret said: 'David and I will provide a strong leadership team for the BFA which is already well known for its work as the Voice of the Professional Beekeeper'.

Bad News for Bees — Fumidil B

Despite ongoing correspondence with Jim Paice, Defra Minister responsible for animal health, we are unable to report progress on the Fumidil B affair. Notwithstanding the growth in *Nosema ceranae* incidence, thus rendering the availability of an effective treatment of strategic importance, the Minister is clinging to his argument that withdrawal was a necessity under EU regulations. Yet, it is well established that sovereign states may take whatever action they find appropriate in the protection of animal (and of course, human) health. We have been joined by the Bee Farmers' Association in the cause; something which many members are beginning to suggest should become a campaign. We will continue to pursue this matter, which may need now to escalate to the European level.

Tim Lovett, BBKA Public Affairs Director

Your Help is Needed

I am biochemist with an interest in the use of natural products as antimicrobials. Could I ask beekeepers to send a small sample of propolis (weighing just a few grams) to me in a standard envelope or plastic bag to the address below. Please include the date collected and postcode for inclusion in an anonymous database. The project, subject to approval by the College of Medicine, Swansea University, will analyse the compounds present in each propolis sample, plot the efficacy against a range of microbes as well as against a map of the U K. At a later date I will provide a report in BBKA News of my findings.

Rheinalt Morgan BSc (Hons.)

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Business Corner

Education and Husbandry Committee

The re-formed Education and Husbandry Committee has now met twice and is starting to formulate a revised education strategy to take forward into the future. This takes note of the ADM motion to try to put more resources towards education and training to reach all members.

The work over the last two years in producing the four 'Course in a Case' will now go forward to a review and revision period; the White and the Yellow CiCs having had two seasons of use and the Red CiC having been used by a few. Any feedback will be welcomed and requests will be made to those that have purchased the cases so that levels and ease of use can be established and any required revisions can be made.

The need for training of new beekeepers continues; I do not know if we have yet reached the peak but numbers are still high. Beginners of two or three years ago should be taking their Basic Assessment if they have not all ready done so and there is a thirst for further

knowledge. A major push on education this year is to make sure that training at all levels is available to all, and that the courses available are known to all that require them. It is expected that courses can be run at local, regional and national level as required; the numbers wanting the higher levels of training tend to be insufficient to justify running local courses. Where possible courses will be run with local tutors rather than those 'flown in from afar' as continuation of learning is much better in local networks.

Other areas of work include some first attempts at digital training for Disease Diagnosis and an initial exploration of the widely used web-based media for learning.

Work on digitising the slide library nears completion and most of the content both of slides and videos are now available digitally on CD or DVD. Full details are on the BBKA web site.

Julian Routh, Lead Trustee, Education

British Beekeepers' Association Examination Board Vacancy for Correspondence Course Co-ordinator



The Examinations Board, responsible for the management of the BBKA Examinations and the maintenance of standards and quality, is looking for a volunteer to co-ordinate the day-to-day running of the Correspondence Courses. This will include processing applications, matching students to tutors and sending out course packs. The Co-ordinator will work with the Examination Board to maintain course materials and will be expected to attend selected Board meetings.

The ideal candidate for the post will hold or be working towards the BBKA Advanced Theory Certificate in Beekeeping Husbandry. Experience in tutoring students would be an advantage. Having broadband internet is essential. This is a part time home based job. An honorarium will be paid and expenses covered.

Those interested in the post should contact Mrs Val Francis, Examinations Board Secretary by email val.francis@bbka.org.uk or by telephone 01226 286341.

Apimondia 2013

The Organising Committee of the XXXXIII International Apimondia Congress being held in Ukraine from 29 September to 4 October 2013 announces the start of the registration of the full delegates. <http://apimondia2013.com.ua/registration>. The full delegate fee for super-early registration is 150 Euros until the end of June 2012. Download super-early registration forms on http://apimondia2013.com.ua/files/Api2013_regform.pdf

Tetyana Vasylykivska, President, Apimondia 2013

Welsh Beekeeping Centre

A National Beekeeping Centre for Wales (NBCW) is due to open in May 2012 after having secured £200,000 of funding. NBCW will combine visitor facilities, including a 'hands-on' apiary, with training courses and support for practical beekeeping research, so becoming the only project of its kind in Wales. It will seek to develop practical research projects with beekeepers and academic researchers within Wales and aim to help preserve and enhance local and national beekeeping. The centre will also develop its training courses at the Henfaes Research Farm, a Bangor University facility at Abergwyngregyn, and a further visitor facility at Tŷ Hyll near Capel Curig in conjunction with the Snowdonia Society, which will include queen mating hives and woodland gardens as examples of the ideal bee habitat. The main centre aims to attract up to 25,000 visitors a year and will form part of the new £6.5m Bodnant Food Centre at Furnace Farm in the Conwy Valley.

Funding for NBCW was mainly through the Conwy Rural Partnership under the Axis3 Environment theme of the Rural Development Plan for Wales. Other funders include Environment Wales, Snowdonia National Park CAE Fund, South Clwyd Beekeeper's Association, Conwy Beekeepers' Association and the Welsh Beekeepers' Association, John Hall legacy.

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Allergic Reaction to Propolis

I am sure I am allergic to propolis. I would like to know if we are aware of any experts in this field and if there so what they would advise. My story is as follows: I am 67 years old and have been keeping (manipulating) bees since 2008. I have wanted to keep them since I was in my 40's but I felt my job precluded it as I had to frequently travel worldwide on company business. The opportunity came after I retired and it has been an extremely interesting experience ever since. I already know I am allergic to pine sap as I unthinkingly cut a *Leylandii* hedge without wearing a shirt and come out in great wheals across my body where I had leant into the hedge. Since then my hands itch if I drag at the leaves or any part with bare hands.

My apiary site is a purpose-built decking jetty on the river bank at the bottom of my garden. It is fenced and gated to stop my dogs or grandchildren getting too close. The site is bordered by cherry, sycamore and various bee-friendly shrubbery. I enjoyed the first few years and was beginning to feel I would dispense with the Marigolds I always wear when I am manipulating the bees. I am very keen on hygiene and have a pair of gloves for each hive and clean the hive tools meticulously in soda, water and washing-up liquid after closing up each hive. I have three hives and two of them create large amounts of propolis (one like brittle toffee and one a gooey mess). The bee spaces on the hives are correct. There are three enormous *Leylandii* trees about sixty feet away and I believe these contribute greatly to the propolis.

Last spring I started to itch whenever I cleaned up even though I wore gloves. My eyes and ears itched and the lines on the palms

of my hands went red. Swellings developed on my upper arms and torso. The skin on my hands split and peeled. The season wore on, my ears began to itch internally, and my eyes became sore and felt like grit under the lids. The facial skin around my eyes felt like sandpaper and began to flake. Large whip-like marks appeared on my torso and I was itching from my scalp to my nether regions. I felt like packing up as the itching turned to soreness. I took antihistamines — no result. The problem lasted five to ten days; how inconvenient during the swarming period. I do not like to give up so I tried a process of elimination. I tried latex-free gloves. I did not use washing soda. I did not use the same gloves for cleaning as I had used on the last hive in case I had pierced the glove and the cleaning fluid got into the glove. I handled all my equipment using gloves in case propolis (I was beginning to suspect it) residue was on the surface i.e. smoker, cloth cover handles etc.

I started to clean off all my spare equipment ready for the spring (I have duplicated everything to start clean each year) and started by cleaning off the propolis and odd bits of wax residue from it and had blow-torched it earlier in the year. I was extra careful not to touch anything barehanded. The propolis was scraped into a container with soapy water and this created a bit of dust. Then the item was steam cleaned to remove the last traces of wax and propolis (the wax had already been scraped into a separate container leaving minute amounts). I would then have washed the item in a tub of washing soda etc mix to complete the job. I put this last job off as I like to do the whole lot in one hit and have more equipment to do. The task took several hours and each time I needed to relieve myself I took off my gloves, but unfortunately forgot to wash my hands prior to doing so although I performed the usual habit afterwards. When I took off my gloves I used my ungloved fingers to remove the remaining glove. When I finished for the day I noticed the lines on my palms were beginning to go red and the skin either side starting to split. My scalp was beginning to itch. The next day I had the usual itching bumps on my upper torso, wheals on my nether region and over the next few days my eyes itched and went gritty, my ears itched and my skin on my face around my eyes and nose went like sandpaper. What would you do next?

Philip Carter, Worthing BKA

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Your Letters



My Solar Wax Extractor

The photograph below should be self-explanatory. The trolley in question has wide wheels suitable for use on the lawn, the weight is nicely balanced, the angle can easily be set to the optimum and there are thousands of them trapped in car boots just waiting for a chance to get out and do something useful.



Paul Edwards, Beekeeper's Labourer and Coarse Carpenter, West Dorset BKA

And the Pollen Count was Six ... NDB Short Courses

Armed with a snowdrop from the garden, my friend, Andrea, and I set forth on a cold, rather damp February morning, to join four other enthusiastic beekeepers at

Marshall Hall, near Knutsford, Cheshire, where Robert Smith and Graham Royle were holding an NDB course on Nutrition and Pollen. We had been requested to bring some wild flowers, but the weather had not encouraged many to appear, so the snowdrop did instead. After meeting Bob, Graham and the other 'students' and a welcoming cup of coffee, we went straight to work.

The first day, Bob reminded us of the basic biology of a flower and we examined the different parts under the microscope. We identified different 'families' of plants using the 'Wild Flower Key' by Francis Rose. Bob demonstrated how to make slides and stain samples for work with the microscope and soon we were all busy examining our slides, with the additional expert help from Graham (If there are microscopes, Graham is never far away!). I had never prepared a slide before and I was fascinated by the whole procedure.

On the second day, the emphasis was on the role of pollen in plant reproduction and its' characteristics. Bob explained in detail,

the adaptations in the bee which make it an effective pollinator and how it collects and stores the pollen grains to take back to the hive. We learnt about the microscopy and colour of the pollen grains and were introduced to Rex Sawyer's book *Pollen Identification for Beekeepers*.

The last session was identifying pollen grains in honey. Some of us had taken samples to examine and we shared the slides between the group. Gill Royle and Graham provided wonderful catering and Graham did a fabulous job serving the coffee/tea and washing up! Thank you Graham and Gill.

A tremendous amount of preparation and planning had gone into the course; (Graham had more than one or two last minute problems, which he resolved with no interruption to the course,) which was appreciated by all of us. A big thank you to Bob, who travelled so far and who introduced us to a fascinating aspect of beekeeping. What a wonderful weekend.

Catharine J Edwardes-Evans, Cheshire BKA, Stockport Branch

ECONomics

March 2012's article *Going Wild: from Old Lawns to Wildflowers* was extremely helpful, particularly as it looked beyond beauty to practical management. I have also been watching Sarah Raven's series on bees and butterflies on BBC2; and admire the WI and the Royal Horticultural Society for encouraging others to consider the welfare of our insect life. Ecology is currently an inspiring buzz-word (no pun intended), but it seems that support of the honey bee and bumblebee could go further. For instance, if you undertake an eco-build, particularly Level 6, you are allotted points for planting bee-friendly plants and providing a habitat. However, as far as I am aware, that habitat does not include bee hives.

What strikes me as absurd is that if you plant a wild-flower meadow for bees you will get eco points, but not if you keep several hives. Even before keeping bees I was gardening organically and actively planting to encourage wild-life. Providing we do not over-farm the bees, hives are a terrific 'habitat' for them, so shouldn't beekeeping score points too? If I were to undertake an eco-build I would have to enhance my environment by 30% in order to attain Level 6, despite having already done so much, and even if beekeeping did 'score' the fact that I already have the hives would not count. However, it might make people embracing this lifestyle, consider expanding into beekeeping, or even increase their hives. I appreciate that this has pros and cons, but beekeeping is a fascinating hobby, and it is surely worth promoting an official recognition of its value is it not?

Francis des Rosiers, Cambridgeshire BKA

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Branding Iron, Complete with Two Letters/Numbers £18.00
Additional Letters/Numbers £3.00 each.



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