

BBKA News

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



No: 196 – December 2011



Apimondia 2011 opening ceremony

Apimondia 2011

Apimondia is a biennial beekeeping event for scientists, commercial and hobby beekeepers and in September 2011 this event was held in Buenos Aires in Argentina. For those who attend the BBKA Spring Convention, it is a similar event to that with lectures, posters, trade stands and more, but it is international so it has a completely different feel to it. In addition, there are a number of technical tours with both beekeeping and 'tourist' interests.

Argentina is the second largest honey producer in the world, after China, so perhaps not surprisingly this year's event had lots to interest commercial beekeepers.



Korean delegate showing a hornet trap

At the closing ceremony there was success for three British entries. Simon Crosman from Lincolnshire won a gold medal in the individual photography competition, *Beecraft* won a silver medal and IBRA's *Bee World* won a bronze medal in the International Beekeeping Magazines category.

Apimondia usually alternates between the southern and northern hemisphere and in September 2013 Apimondia will be in Kiev in the Ukraine, www.apimondia2013.org.ua and Daejeon in South Korea in 2015.



What are the features of natural honey bee nests? How does a feral bee nest compare with your carefully managed hive? Find out on page 8.



Invasion of Asian Hornets: Husbandry tips to help protect your hive from hornet attack and EU advice on hornet trapping is reviewed on page 21.



Building a hive: Reclaim, reuse and recycle to create bespoke beekeeping equipment at a fraction of usual costs. See page 26 for more.





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Chairman's Letter

The last gasp of summer at the end of September/early October has now long since gone and my thoughts have had to give consideration to bringing colonies to sheltered positions for over-wintering. I, along with a beekeeping partner, keep hives in the army firing range in north Northumberland between Alwinton and Otterburn all the year round, these being well sheltered as they are tied down onto pallets to protect them against gale-force winds and marauding sheep. Other colonies, there to take advantage of acres of willow herb, need to be brought nearer to home before the winter starts to make access difficult. We completed this task in early October. Unfortunately, this year they ignored the willow herb, found some heather but failed to exploit that fully; ever the optimist I am sure we will prosper next year.

'Watch out there's a thief about.' As winter approaches and apiaries that are hidden in the summer suddenly become exposed as the vegetation dies back, there is a risk of opportunist crime; two problems have been reported to me recently. A number of hives were taped up ready to be moved when the owner arrived; thieves having just made themselves scarce. It suggests that beekeepers everywhere should remain vigilant and pay occasional random visits to apiaries that they feel might be at risk. The other instance was a beekeeper living on the border with Scotland reporting losing circa £8,000 of stored equipment including heather press and numerous national hives; these are all security coded and the police have been informed.

During the past few months I have drawn your attention to the need to have plenty of members willing to put themselves forward as BBKA Trustees for 2012 and beyond. I am pleased to report that we have more nominees than we have vacancies, which with seven vacancies is a remarkable achievement; thank you to everyone involved.

On the subject of Trustees I am sorry to advise that David Bancalari has stood down because of ill health. David, who has been a Trustee for two years, was a bee farmer and extremely knowledgeable about European legislation on matters related to honey and honey bees. David's input into our discussions will be sorely missed and we wish him well in the future and hope for an early return to good health.



Brian Ripley, Chairman, BBKA

Exam Success

The Worshipful Company of Wax Chandlers has awarded the prize for the Best Master Beekeeper to Jo Schup from Shropshire.

Congratulations Jo!

Cover photos: Apimondia 2011 ceremony image and Korean showing hornet trap, Clive de Bruyn; right-hand panel: top, Dr James E Tew; middle, Jean Haxaire; and bottom, Dr Chris Coulson.

Contents

Regulars

Chairman's Letter	3
In the Apiary	4
Beekeeping Notes for Beginners	7
The Forager	13
Exam Results	17
On the Bookshelf	25
Learning from Other Associations	26
BBKA ADM 2012 Nominations	29
BBKA ADM 2012 Propositions	29
Business Corner	30
Diary of Events	30
Classified Directory	33
Your Letters	34

Features and Practical Advice

What's New at the Spring Convention 2012?	5
Some Features of the Honey Bees' Natural Nest	8
A Closer look at Colony Conflict	11
Disastrous Beekeeping Purchases	15
Pondering the Invasion of Hornets	21
A View of Bees: Language	23
Registration of Honey Premises: Regulations	24
BBKA Finances: An Overview	27

Pull-out Leaflets

Wax Moths	after p16
Preserving Hives	after p20

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In the Apiary

Check hive stores, clean unused hive components, repair damaged frames and recycle wax. It may be winter, but a beekeepers' work is never done!

Bees should now be well into their period of quiescence only being seen on nice warm days flying for cleansing flights. Regular visits to the apiary should be made to make sure that hive roofs have not been blown off and hives are still upright and in good order. If you treat with oxalic acid, as discussed last month, it is a good idea to look between the frames and check the stores. If the bee cluster is at the top of the frames it indicates a shortage of stores and emergency feeding using 'candy' will be required. Some beekeepers heft hives to make a rough assessment of stores; this is where one side of the hive is lifted and the weight gauged. If you have not done this before you need to heft an empty hive containing combs to get an idea of the weight so as to make comparisons. With a little experience you will quickly learn which hives need emergency winter feeding. The more technical beekeepers use a weighing scale and calculate the amount of stores!

Winter jobs

Now is the time to clean up stored equipment. During cold spells propolis and wax become very brittle making it easy to clean up frames by scraping off the extraneous pieces of comb and propolis. Old and damaged frames can be destroyed and poor combs recycled by melting them down for beeswax. The inside of wooden supers can also be scraped and lightly scorched off, and I find that a light rub with a wire brush removes the propolis that rises to the surface after heating. Having clean frames and supers will make hive management easier next year. Queen excluders need cleaning according to type. Wire ones can be scraped and wire brushed before lightly flaming with a blowlamp, being careful not to melt any soldered joints. Perforated and plastic excluders can be scrapped off and scrubbed clean in washing soda solution. Some very useful plastic trays are available from garden centres that make ideal soaking pots. Plastics can be cleaned by scrubbing using washing soda solution, disinfected by using

a solution of household bleach and rinsed in clean water before storage and use.



Hive toppled by livestock. Photo by Pinguis Imperium.

Stored super combs need checking each month for wax moth damage. Providing the combs have never had brood in them they should be safe. Wax moth larvae cause damage by eating the comb but they need protein in their diet so if the comb is only pure beeswax they cannot survive. Comb that has been used for brood is best rendered but if you must keep it, deep freezing kills all life stages of wax moth. Never use mothballs, PDB crystals, or similar as the chemicals, which are

stock. Most beekeepers have less than six hives so queen rearing projects may seem daunting but small scale beekeepers can use artificial swarm techniques or make nuclei to select and improve stock. Study now and make your plans for 2012.

Having mentioned study, winter is a good time to work on the theory, and if this is organised through BKA groups it is often more effective. When I started beekeeping in the 1980s it was difficult to find any training as

the Agricultural Colleges had mostly stopped running courses and BKA groups were very spasmodic in their offerings. Today it is different; much more is available with the BBKA introducing Course in a Case as a basis for training through the exam modules. These 'cases' should not be dismissed because groups already have courses, but should be used as the basis of future courses to ensure good quality, standardised information within a course structure available throughout England.



Winter training group. Photo by Pinguis Imperium.

With Christmas coming up now is the time to be dropping hints for that beekeeping book or piece of equipment that you need or wish to try out. If you need some new equipment place your orders early to ensure it is available when you need it next season. With the surge of new beekeepers sometimes you may be disappointed when sourcing during the active season due to unprecedented demands.

This will be my last 'In the Apiary' having written the column for a year and I hope that readers have found it useful. It has been an enjoyable and challenging experience but I feel that a regular change of author is essential to maintain freshness so I wish my successor well.

Happy Christmas and good beekeeping for 2012.

Pinguis Imperium

considered harmful to humans, are absorbed into the wax and then are subsequently into honey crops.

Plan ahead

During winter evenings why not check your records with a view to improving your bee

What's New at the Spring Convention 2012?

The BBKA Spring Convention moves to Harper Adams in 2012; the editor talks to Tim Lovett, the Spring Convention Chairman.

Ed: Why is the event moving from Stoneleigh Park?

TL: The main reasons are that the trade show was more or less at its limit and with more people attending the lecture facilities at Stoneleigh were becoming inadequate.

Ed: Will the event cost more to stage and will ticket prices rise?

TL: No, some costs are a little lower at HA as all the lecture and seminar rooms are equipped with IT kit, computer projectors, screens and sound. Ticket sales will start via post or the BBKA Website www.bbka.org.uk on 9 January 2012 and prices will be the same as for 2011; BBKA Members £14 in advance and £16 on the day, non-members £20 in advance and £22 on the day.

Ed: What will the lecture facilities be like?

TL: The halls are all larger than those at Stoneleigh. However, that still does not guarantee a seat for everyone at a specific lecture; just as at Stoneleigh we have to try to guess what will be most popular.

Ed: Are there any major innovations in the programme?

TL: The programme will as usual offer a full range of lectures and courses with leading international and national speakers. Innovations include a recognised food hygiene qualification, a brewing with honey course and a practical course for preparation for the Senior Husbandry qualification.

Ed: Will there be a queen-rearing event?

TL: Yes, and the microscopy courses will be run in the HA laboratories. We expect these to book-up quickly. There will also be activities for non-beekeepers.

Ed: The trade exhibition is always a draw; what arrangements are being made for it?

TL: We have two large adjoining halls for the trade show which is already a sell-out. More space means wider aisles and we hope to manage the early 'crush for bargains' rather better.

Ed: Can delegates stay on site?

TL: The on-site, en-suite rooms are all singles (£45 B&B) but we can offer 'pairs' of rooms to couples (£76 B&B). Camping and mobile home facilities are available on-site too.

Ed: What about catering?

TL: Good food at sensible prices will be available from a number of outlets during the event and there is also a lounge bar.

Ed: What is access like?

TL: The campus is close to Newport, Shropshire which is easily accessed by the M6/M54. Rail access via Stafford or Telford is good too. From the south the journey is a little longer than to Stoneleigh, but for our northern members, it is shorter.

Ed: So can you sum up the plus points of the move?

TL: We will find ourselves on a pleasant rural campus, with good didactic, trade and social facilities, which should make for an enjoyable weekend. There are lots of attractions in the area for those who have a life beyond beekeeping! More details will be put on the BBKA web-site (News/Events) in due course.



Spring 2012 Convention

Friday 20, Saturday 21
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Beekeeping Notes For Beginners



In this winter period you should leave your bees alone, but you can still check how they are doing, undertake minor repairs, feed if needed and treat for varroa if the levels are high and brood is absent.

December is traditionally the quietest and most anxious month for beekeepers. In this case tradition is wrong; quiet, yes, but colonies are either already extinct (!) or are still doing well. Early February will be when special care needs to be taken regarding the risk of starvation.

Check your bees during the winter

On a warm day in December, when temperatures are 10°C or above, go round the apiary and look for several things:

- ❑ Signs of bees flying; always reassuring, but possibly misleading. If most hives are flying but one is not, check that its entrance is not blocked.
- ❑ Hive damage or bad joints; fix as best as you can.
- ❑ Signs of excreta staining around the entrance of a hive or on roofs in the apiary generally. This is a sign of poor hygiene and possible nosema disease. This colony will need a good clean up in spring.
- ❑ Have a good smell of each hive. If you smell 'vinegar-like' smells, this is probably fermenting honey. Did you take all the wets off in September/October? If you can identify the offending part and remove it, then do so as it will not help the bees to leave it on the hive.
- ❑ If any hive smells really decomposed and you are quite sure it contains no live bees then close it completely. Use parcel tape to seal the entrance and prevent any disease spreading. This will need to be dealt with (carefully) in spring.
- ❑ Check the weight of each hive. If it is warm, lift off the roof (wear a veil). If you cannot see any bees, all is well. If the hive is light or you see bees all around the hole in the crown board, then the bees need feeding. Wait until you get the best warm weather you can then insert slices of fondant (sometimes called bakers' candy and available from bee suppliers or a good supermarket). These are cut to about 10mm thick, placed on clingfilm and put in the brood box on top of the frames, not in the roof. That way the bees have direct contact with the food. You will need to lever one side of the chambers up above the brood box to insert this, but use your smoker sparingly. You may see the clingfilm emerge from the entrance a few weeks later.

Monitor varroa levels and treat if high

In the rush towards 25 December another date which is often overlooked is 21 December, the winter solstice and the shortest

day. After this the days start to extend and although it remains cold, the bees will start to pick up the extending day length in mid-January and react accordingly. This means brood rearing will start to pick up, particularly in the south. Why is this important in December? It is all to do with varroa management (by now you should have guessed). You should still be monitoring your varroa drop levels and these should remain low. If they continue to be high, you have probably been wondering what to do as it has been too cold to open hives and add any treatment.

Varroa breeds in brood, but the adult mite can survive in the hive for some weeks waiting for a chance to enter a brood cell and reproduce. As long as brood levels remain low (almost zero), the mites have nowhere to go and must simply wait, clinging on to the adult bees. In this state they are vulnerable. If your varroa levels remain high, however, then the small window in late December/ early January when the varroa are exposed on the adult bees with little or no brood present gives an opportunity to treat so that you enter next spring in a good state.

Treatment is done by applying a solution of oxalic acid directly to the bees in the brood box. There is more information about this on page 4 of November BBKA News or from NBC but the following points are worth making:

- ❑ Oxalic acid is dangerous; follow precautions.
- ❑ Use a fresh, pre-mixed solution from a reputable supplier (often a syrup/oxalic mix). Do not mix it yourself unless you know what you are doing; the dosage is critical.
- ❑ The application is per 'seam' (the line of bees between frames) not per hive.
- ❑ Practise application using a syringe and water.

This treatment can only be done once in a given hive. There is some risk of damage to the adult bees, but these will die in the spring, so the effect on the colony is minimal. The treatment will damage eggs and brood (sealed or unsealed), so must be done when brood levels are at a minimum.

Finally, remember the custom of 'telling the bees'. Superstition often has a basis in fact, so while you are going round the apiary wish the bees a Merry Christmas and a prosperous New Year, although the latter is really down to you to make happen.

Chris Deaves, Chair of Education and Husbandry Committee



Your bees may be safely 'battened down for the winter', but you can still use your senses to check that they are OK. Photo by David Wootton.

Some Features of the Honey Bees' Natural Nest

The natural nest cavity

When searching for a new home, bee scouts normally look for a surprisingly small cavity; maybe as small as one foot cubed. Finer features of a future bee home are:

- ❑ It should be dark inside,
- ❑ It should have a defensible entrance,
- ❑ It should be dry,
- ❑ It should not have anything else living there such as birds, squirrels or ants.

Ideally, it should not be on or in the ground. When tearing into trees, early beekeepers were confronted with a morass of bees, comb, brood and dripping honey. How could any structure be found in something so chaotic? As we now know the bee nest is a highly structured living environment. Understanding that structure can make one a better beekeeper.¹



Figure 1. A natural nest cavity. Note external comb pieces on the left-hand side of the tree. Photo by Dr J Tew.

The population of the nest

Wild nest populations and sizes vary significantly. The pace at which a colony can fill a cavity varies greatly. Therefore, some nests are large while others stay relatively small. Reasons for size variations could be:

- ❑ Genetics,
- ❑ Presence of diseases and pests,
- ❑ the availability of nectar and pollen resources,
- ❑ Water resources,
- ❑ Pure luck (tornadoes, lumberjacks or the natural death of the host tree).

In fact, as humans have altered the

world's environment, suitable nesting sites have become much dearer to scouting bees forcing them to accept sites not ideal for their needs. Not infrequently, a swarm is forced to actually build in the open; a fatal decision for most nests within the temperate climates.

Nest fixtures

The natural bee nest is plainly furnished with wax combs only. Although bees can diligently modify the nest cavity to a degree, for the most part they must accept the space as it is. Along the top and sides of the nest, some bees will lay out the beginning midrib of combs and other bees will begin to construct comb along those lines. We do not know how bees measure the spacing needed when laying out for dimensions for future comb, but we have long ago discovered that bees require living and working space; the famous 'bee space' concept that allowed the subsequent development of artificial domiciles.

When bees first occupy a nest cavity, the first matter of business is to construct worker comb and set up housekeeping by getting a brood nest started. Besides being an area to nurse developing worker bees, worker-sized comb can also be used to store nectar, pollen and, occasionally, water.

Combs seem to be produced almost mystically. The bees will mass together into a cluster. The cluster is not a rigid structure, but is fragile and temporary. As bees hang in such a cluster, the force of gravity will cause it to hang perpendicular; in essence, combs are built in line with gravitational pull. Later, within the dark hive, this orientation with gravity becomes important in orienting the dance language communication procedure. Four pairs of wax glands on the ventral surface of the bees' abdomen produce virgin wax. Comb constructing bees pass a newly produced wax flake forward to their mouths where the wax is chewed and pulverised. After a short time, the wax particle is moulded,

using the bees' trowel-shaped mandibles, into part of a developing cell. It is a communal effort. Other bees may reshape previous efforts before adding their own contribution of wax to the new cell, but finally, by committee, a new cell is produced. No doubt no single bee actually constructs



Figure 2. An exposed nest that will perish during the winter season. Photo by Dr J Tew.

a single cell. Experienced beekeepers have seen the completed cells in use near the top of a new frame while lower on the comb; shallower cells will still be under construction. Bees build comb as needed. For the beekeeper, new wax is nearly snow white and is valuable for candles and other wax products.

Cell shapes

Individual cells are classic hexagons. Upon mathematical review, this configuration provides the most strength and space efficiency of all common geometric configurations. The cell base is important in that it is not simply a flat plane, but is pointed in such a way that each hexagonal cell base provides one third of three cells on the opposite side of the comb. Hexagonal shapes are efficient in both space and building materials.²

The importance of a nectar and pollen flow

Inexperienced beekeepers are frequently disappointed that all brood chamber space and super space is not used by the bees during a particular season. Indeed, beekeeper-supplied foundation may even be

chewed and mangled by bees not building comb on it (though such damaged foundation will probably be successfully used during subsequent productive seasons). Bees will only construct comb on the impetus of nectar flow and space shortage. Simply stated, bees must have building material before they can build. Nectar provides that building material, but an unusual building material it is for it can also be stored as honey rather than restructured into wax. Bees will not use stored honey to construct

significant amounts of new comb. Again, the experienced beekeeper will provide drawn comb for the bees to store the crop rather than requiring bees to rebuild comb each year.

Comb is expensive

Comb is costly for the bees to build. It has been shown that bees must metabolise about 7–8 pounds (3.2 kg–3.6kg) of honey to produce one pound of wax. But with that one pound of building material, bees can build 35,000 cells in which they can store 22 pounds (10kg) of honey. Consequently, their approximate net gain after consuming 8 pounds (3.6kg) of honey is 14 pounds (6.35kg) of stored honey plus reusable comb. It takes about 10,000 bees, over a three day period to produce one pound (0.45kg) of wax. That one pound will be made up of about 500,000 wax scales.

Comb construction for the bee hive is clearly an investment. Inexplicably, cappings and other wax particles are not reused to any degree, but are allowed to drop to the bottom board where they either accumulate or are discarded in front of the colony. New wax is soft and pliable and will break easily, but as the comb ages, it becomes reinforced with old cocoons and propolis. Whereas new comb is snow white, old comb is nearly jet black.

Types of comb cells with the nest

Worker comb is, by far, the most abundant comb size within the colony. As mentioned above, worker sized comb (about five cells per inch or 2.54cm) can be used by bees to house developing worker bees or to store honey and pollen. Larger cells, about four cells per inch, are used to produce drone larvae or to store honey and pollen. Distorted cells or cells of intermediate size



Figure 3. A natural nest in a damaged Maple tree. Note propolis and wax wall coating. Photo by Dr J Tew.

can occur that are used by bees to splice different sizes of cells together. In other words, worker comb will be filled with patches of drone comb with small amounts of transitional comb wherever needed in order to make a piece of solid comb.

Some worker cells may be drastically modified or special cells may be built purposefully for raising queens. As you would expect, this type of specialised comb cell, though distinctive, is the least seen of all the cell types. A modification of queen cells is queen cups which are simply queen cells that are not in use. Worker cells, drone cells, queen cells and transitional comb make up the types of comb within the colony.

Brace comb, burr comb, or ladder comb

Apparently, brace, burr and ladder combs are terms describing the same structure. Bees will frequently build brace comb between frames, above or below frames, or on the bottom board (floor) especially after a colony has been recently moved. Anywhere bee space is violated additional comb may be built that is a nuisance to beekeepers in commercially manufactured hives. Normally, in managed hives, it is scraped off and melted as high quality wax. Within wild nests it remains in place and helps give rigidity to the overall nest.

Bee space

The concept of bee space has been mentioned several times. Within both wild and managed hives bee spacing must be implemented. Bee space is generally considered to be

anything between 1/4" (6.35mm) and 3/8" (9.5mm). Space less than 1/4" will be filled with propolis while anything greater than 3/8" will have either comb or brace comb built within the space depending on its size. LL Langstroth is generally given credit for conceptualising and describing the concept of bee space.

Propolis — a natural caulking compound³

Propolis is a hive product that is little known outside of the inner circles of beekeeping. It begins as a resinous material collected from the buds of trees or from resins in softwood trees. Wax and other by-products are added to make propolis. It has several uses,

including being used to seal the hive structure.

Though stringy and sticky when fresh, propolis dries hard and brittle. It is soluble in alcohol and has a pleasant weedy odour. Since there is no difference between the two, both wild and managed bees will collect propolis. Caucasian bees are renowned for collecting copious amounts of propolis and, if left to their own schemes, will very nearly close an entire colony entrance.

Propolis is the material that causes the hive to crack sharply when opened. Propolis was the primary demon that relegated so many hive designs to beekeeping's junk heap. If colonies are not opened for several years, propolis will make the hive nearly indestructible. Propolis, along with pollen, darkens white wax over a period of just a few years. In addition to being used to polish cells, propolis is added to the wax that covers cappings, therefore, giving them a different appearance than honey cappings.



Figure 4. An unintended comparison of natural and managed combs. Photo by Dr J Tew.

Propolis is 'anti-bacterially active' and will restrict bacterial growth. In addition to being used to make primitive varnishes, in some countries propolis has been used as a toothpaste component. Probably due to this antibiotic characteristic propolis is used to entomb anything the bees cannot move — such as a dead mouse or a small tree twig.

Inside the warm, dark nest

Inside the warm, dark nest bees probably communicate by pheromone perception (which is a type of smell), touch and other sensory perceptions such as gravitational sensitivity or electro-magnetism. It is also incredibly crowded; bees are literally shoulder-to-shoulder. Yet, all of these characteristics vanish when the beekeeper removes the top from the hive. With the application of smoke the effective communicative odours are masked. All is visible and the normal way of the colony is totally disrupted.

Within the undisturbed dark hive, everything seems to have an odour cue: workers, queen, drones, wax moths, brood, nectar, pollen, the hunger of larvae, danger, and whether or not larvae are in the correct cell. As beekeepers, we crudely use

smoke to mask this elegant chemical communication. Temperature must be regulated to about 35°C in the brood nest, nectar must be enzymatically reduced and excess water removed to form honey; brood must be fed freshly collected pollen and this hive-city must be defended from intruders and pests.

This society must be kept in balance. In a full strength colony, about 60,000 sterile workers, one fertile queen, and about 400 to 600 drones make up the population of a strong hive. Developing brood must be produced in anticipation of upcoming nectar flows or winter seasons. All these individuals come together to form the super-organism — the bee nest. Individual bees are incapable of supporting themselves for more than a few weeks under ideal conditions. The total bee nest is the animal, not the individual bee. Such is a day in the life of a bee in the nest.

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References

1. For honey bee biology information is available at <http://www.onetew.com>. Select the PowerPoint pdf page.
2. An excellent presentation on comb function and production is presented in Tautz, Jürgen. *The Buzz about Bees*. Heidelberg, Springer-Verlag, Pp 165–77.
3. More propolis information is at *Propolis*, James E. Tew <http://www.onetew.com>. Select the PowerPoint pdf page.

Dr. James E. Tew is a Consulting Professor for the Alabama Cooperative Extension Service, Auburn University. In this capacity, he serves as the State Beekeeping Specialist, conducts extension and outreach programs, and addresses honey bee issues through on-site visits and social media outlets.



Dr. Tew contributes monthly articles for national beekeeping publications and has written two books: *Beekeeping Principles* and *Backyard Beekeeping*. Dr. Tew is a frequent speaker at state and national meetings and has traveled nationally and internationally to observe beekeeping techniques and offer suggestions.

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A Closer Look at Colony Conflict

When usually placid bees can show aggression

Within the highly cooperative honey bee society conflict is rare, but it can exist at low levels (e.g. worker policing)¹ and may become intense periodically during drone assassination² and queen elimination.³ Most notably, conflict increases drastically during temporary polygyny (the presence of multiple queens) which occurs during queen replacement whether through superseding or emergency queen rearing, and during colony reproduction or swarming. These supernumerary queens are usually quickly eliminated in the re-establishment of monogyny. Both worker and queen behaviours may be involved in the queen reduction process. Newly produced queens fight each other until only one queen remains in the brood nest. Young queens patrol queen cells to kill rival queens when they are vulnerable. Workers act aggressively toward queens to prevent them from destroying queen cells and queens 'pipe' to inhibit worker aggression. Workers immobilise queens to make them easy targets for rival queens and queens eject hind gut contents to cause their rival to be immobilized by the workers. Survival to become the egg-laying mother of a colony is the ultimate goal of this reproductive competition among honey bee queens.⁴

Duelling queens have secret weapons

Queens have long been observed to eliminate rival queens during temporary polygyny by fighting.^{5,6} During a fight, rival queens usually grapple with each other before one kills the other using her sting; after which the workers dispose of the victim. Direct interaction between two competing queens is infrequent during temporary polygyny and consequently the process of queen elimination may take several hours to complete.⁴ One of the most spectacular events that can occur during a queen duel is the ejection of a queen's hind-gut contents. A queen curls her abdomen underneath her until her stinger is pointed at her opponent's thorax and head, and she expels a translucent liquid that hits her opponent.³ The spray that hits the target queen has three effects:

- ❑ it interrupts the encounter between queens causing the combatants to separate,
- ❑ it covers the victim with fluid,
- ❑ it alters the behaviour of the workers towards the victim.

This behaviour was observed by staging queen duels within colonies housed in observation hives.⁴ Spraying occurred in 39.7% of all interactions between rival queens and was recorded in twelve of fifteen duels. Workers were highly attracted to the surfaces of individuals who had been contaminated by spraying, forming tight clusters around them, which restricted their movement. One or both queens in a pair became immobilised by the workers in one third of all spraying events, respectively, but the queens were never killed by the workers. Conversely, a mobile queen penetrated the worker aggregation and stung an immobilized queen in one-third of the observed bouts. So spraying may serve as a fighting tactic by virgin queens to increase their chances of winning by temporarily immobilizing their rivals.

Last queen standing

In 2011 Gilley examined the behaviour of honey bees following the production of new queens at the period of a colony's life-cycle when intra-colony conflict is at its peak.³ A typical honey bee colony rears new queens annually during swarming preparations and the primary swarm is normally accompanied by the colony's

current queen. After departure of the prime swarm there remains in the nest approximately half of the workers and 15–25 pupating queens.⁷ If there are insufficient workers to produce another swarm, then the first queen to emerge from her cell typically kills the other queens before they complete pupation, and she becomes the new queen of the colony. However, if there are enough workers to produce a 'cast' (a second swarm) then most queens emerge safely and compete for queenship of the colony. A few of these queens may depart with one or more casts, but most remain in the nest engaging in deadly combat until only one queen remains. The combat between these queens can be viewed as a tournament consisting of a series of lethal duels. The survivor of each duel goes on to fight in the next until only one queen remains alive in the colony. A few of these queens will have avoided the tournament by departing with casts. The serial nature of the duels that take place during a tournament is a result of the asynchronous laying of the eggs destined to become queens. So one queen typically kills her rival before the next queen emerges from her cell; rarely are three or more queens involved in a duel simultaneously.³

Virgin queens on patrol

Newly emerged queens spend most of their time moving quickly around the hive, approaching and contacting the queen cells that contain rival queens.³ These queens show an ability to discriminate occupied from unoccupied queen cells, presumably by detecting pheromones transmitted through the queen cell wall.⁸ Queen cell patrolling might increase a queen's chance of winning the tournament



Workers inspecting two adjacent queen cells. Photo by David Wootton.

in several ways. Firstly, she may be able to attempt to destroy her rivals while they are still defenceless pupae.³ By making frequent approaches to queen cells a patrolling queen may reduce her risk of dying in a fight by catching a rival just as she emerges from her cell and fatally stinging her through her soft, unsclerotized cuticle.³

Maturity matters when queens fight

When pairs of young (24 hours old) and older (72 hours) queens fought, researchers found that the older queen won in two thirds of 27 observed pairs.⁹ The advantage of age may be even greater when the younger queen is less than 24 hours old, as would be the case during queen-cell patrolling.³ The reduction from polygyny to monogyny is affected by queen age, but not by queen quality.⁹ Older queens, i.e. those reared earlier in the queenless period, had an advantage during queen fighting over rivals two days younger

than themselves. Factors that may confer this advantage, such as harder (sclerotized) cuticle or increased pheromone production, are purely speculative at this point. Polygyny reduction appears to be another mechanism that has been under selection for colonies in requeening as quickly as possible. This advantage would be even more pronounced in a more natural context. Older queens have an opportunity to tear down rival cells before their emergence, which would consequently give older cohorts an even greater advantage during polygyny reduction.¹⁰ A third possible function of queen-cell patrolling may be to gather information crucial for making decisions such as whether to depart with a swarm or remain in the nest to duel with rival queens.³

Queen piping can delay queen emergence

Piping has been well described acoustically and has been shown to delay the emergence of mature queens. By delaying conflict with her emerged rivals, the piping queen may increase her chance of successfully attacking the cells of rival queens. When a queen pipes, she pauses, lowers her thorax to the comb, and rapidly contracts her wing muscles for about five seconds, causing a piping sound and

Bees recognise and may favour their relatives

Workers can distinguish between adult queens that are related and unrelated to themselves, possibly by using a chemical signal originating from the tergite glands.¹¹ Using this discriminatory ability, workers can behave more aggressively towards introduced queens, but such behaviour has usually proved to be non-fatal.^{12–15} The influence of relatedness during queen fighting is largely unknown,⁴ but there is a suggestion that incumbent queens have a 1.7:1 advantage in surviving a queen fight if they are half-sisters of both the workers and their introduced rivals.¹⁴ On the other hand, an introduced queen that is a half-sister to the workers, but is a super-sister to the resident queen, is less disadvantaged during queen fighting.

When the influence of relatedness on the pre- and post-emergent survival of queens was investigated⁴ workers did not preferentially rear sisters over non-siblings under conditions of natural queen replacement. The potential influence of cell position on larval acceptance (related or unrelated) was also non-significant. The number of queen cells accepted by the workers and the number of queens that were reared to emergence was independent of relatedness. However, cell position was significantly related to queen emergence; queens had a higher probability of emerging when positioned closer to the centre of the brood nest. After queen emergence, however, there was a significant effect of a queen's relatedness to the workers on her surviving fights with rival queens; both in fighting ability and survivorship. The related queen had a significant advantage in winning but the mechanism of this bias towards related queens is unknown. The difference in post-emergent survivability suggests that kin selection may operate during competition among adult queens at this crucial stage of honey bee reproduction.

Workers can control a queen's fate

Worker bees will routinely keep fully developed queens imprisoned in their queen cells for prolonged periods of time.¹⁶ Even though some queens may cut open their cells to emerge, the workers imprison them by adding additional wax to the slit at the tip of the queen cell where the queen has cut through the pupal silk and wax. It is through this narrow slit that the worker bees feed the queen inside her 'cell-prison'. Why do bees keep perfectly good queens entombed in the cells? There is some evidence that worker bees are using their collective consensus to control the fate of these queens. The imprisoned cells that are shaken by worker bees are

more likely to be the first to emerge. The workers control the timing of queen emergence by adding or reducing wax deposits on the incision at the tip of the cell. Finally, there is some evidence that bees will selectively confine half-sister queens over super-sister queens, which is one of the best examples yet of potential genetic control of the final queen.

Once a queen emerges from a cell the worker bees continue to control her fate. They can favour one queen so she emerges first, allowing her to systematically sting her sisters still confined in their queen cells.⁴ Or the workers may indirectly kill the queen by arranging two queens to 'duel' on the comb until one queen is dead. The workers often have control over the success of the fight, keeping one queen in a 'ball' of bees so she is less able to defend herself. Indeed, a queen is more likely to win if related to the worker bees.

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The Forager asks: Economy or False Economy?

I recently had the pleasure of spending some time chattering to and handling bees with one of this year's new beekeepers, and very interesting it was too. He had, quite wisely, restricted his expenditure in the first instance as he was not at all certain that he would fully take to beekeeping or indeed, whether it would take to him. So, what he did was to buy new equipment, but from one of the many 'budget' suppliers. He was extremely happy with the bee suit that they sold him and with his smoker (he had certainly mastered the art of lighting that and keeping it going). But he had some reservations about the hive equipment and I must confess so did I.

We started out by taking the roof off. It was one which had been made to look like a WBC roof, presumably to make it more 'attractive' but as anyone who has operated with these roofs will know, they cannot just be inverted and used to stack supers on as they are inherently unstable. Fortunately, he had had the good sense to place a couple of logs down which made the roof stable when inverted, but how many beginners would think of that or would they just struggle. Next, we got to the crown board and here we experienced another problem. Whether the manufacturers are unaware of bee

space or just did not care I do not know but the crown board was made with about 4mm bee space on either side; of use neither to man nor bee! Again, how many beginners would realise that the brace comb or propolis build up was actually due to inaccurate dimensions of the equipment?



Problems with bee space! Photo by The Forager.

However, we persevered and the next task was to remove the super in order to inspect the brood. This actually proved to be very much more easily said than done because a significant amount of brace comb had been drawn by the bees both above and below the plastic slotted excluder which had been supplied with the equipment. Because, once again, the manufacturing dimensions were not accurate, the bees had drawn brace comb

on the bottom of the super frames and the top of the brood frames and, even though the queen excluder was made of quite rigid plastic, it was already warping after only a couple of months use. At this point, I attempted to demonstrate the correct use of the hive tool to remove the brace comb but a combination of the very poor quality wood used to make the frames and the extremely sharp edge of the hive tool contributed to the top of each of the frames being 'shaved' of quite a lot of wood. Only after I



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The right bee space. Photo by The Forager.

had embarked upon this task did my host warn me that he was rather 'surprised' at how sharp the hive tool was'.

I really do not want to bore you with this tale, but it

does continue. The brood box was supplied without runners and so the frames were propolised to the box making removal difficult, especially as the beekeeper had chosen to run with twelve frames in the National box and did not have a 'J-hook', and when they were actually removed there was around 15–20mm of additional comb below the bottom bars of each frame because the floor was excessively deep. As the main task that day was to put the colony into its winter state by putting a stores super under the brood box, this was a particularly difficult task and necessitated removing all of the excess comb and brood. The beekeeper admitted that he would not have had the confidence to carry out that particular manoeuvre and would have just left the excess comb in place thus building up a problem for next year.

So why have I chosen to tell you about this experience? Quite simply because it occurs to me that many of the people who come into beekeeping and then leave it almost as quickly may well do so because of experiences such as this. They may actually be being hampered in their enjoyment of our craft by using the poor quality equipment which they are getting from 'budget' suppliers. As they do not really know what to expect, they may feel that experiences such as the one I had are the norm while I am able to appreciate that it is *not* — because I do not tolerate equipment, which is not made to the right dimensions or the right quality. Incidentally, as I was tightening the frames up in the brood box I found two more problems. The first was that the ends of the box were in danger of popping out as there were no neat joints, just already rusting nails, and the second was that I could feel the hive tool beginning to bend!

I must confess, I do not know what we can do about this problem, if a problem it is, except to raise awareness, but it would be a shame if we are losing beekeepers solely because of false economy.

The Forager

Briefly — 'Undersupering' for Winter

For many beekeepers this has long been a common practice as it allows the extra space for winter stores that a super can give while reducing the risk of isolation starvation that using a 'top' super creates. It is used without a queen excluder between the two boxes and has the added advantage that by moving the brood nest, and thus its warmth, further away from the entrance, mice are less tempted to use the colony as an overwintering residence. As the brood volume is increased by using the super, the circulation of air is improved thus reducing any possible condensation problems.

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Disastrous Beekeeping Purchases

Each year the BBKA sponsors the National Honey Show essay, the winner of which is announced at the annual National Honey Show. Congratulations go to Margaret Ginman, the 2011 winner, with her essay about disastrous beekeeping purchases, which is here for you all to enjoy. For 2012, the title for the essay is 'A Funny Thing Happened at the Apiary.' The essay needs to be not more than 2,000 words, excluding references. Now might be a good time to start writing!

Oh dear! Disastrous beekeeping purchases? My essay could be titled 'Angry young man meets Disgusted of Tunbridge Wells.' Jimmy Porter, you may be disgruntled, but there was no need to invent such a cruel device to both man and bees. No escape from the disastrous consequences when your invention landed in my hands!

My complaint against you, Mr Porter, really starts with an idle conversation between two innocent beekeepers — one an 'absolute' expert who had been keeping two hives for all of one season and myself — a near expert who flicked through Ted Hooper's book, which was a Christmas stocking gift and who got his bees this spring. Now; what could be simpler? Put a few bees in a box at the bottom of the garden, take a few of my City friends down to admire them after a few beevies at my upmarket dinner parties and scoop off lashings of that beautiful amber nectar a couple of months later.

I am salivating now as I imagine the butter-soaked, piping-hot toast with golden honey running down my chin and sucking my sticky fingers. There would be hundreds of beautifully labelled jars lining the shelves of my purpose built honey shed which houses my exceedingly expensive electric extractor. I invited my beekeeping neighbour over to have a look. He seemed most impressed.

But I digress. Let me start at the beginning. My beekeeping was going brilliantly. I really don't understand why all you beekeepers make such a fuss of this simple pursuit. I spent thousands on my pristine new hives (White Box Cartons I think they are called) and got my gardener to set up an apiary under some large chestnut trees at the bottom of my two acre property, near where I do target practise with my airgun. My bees were delivered in a stiff cardboard box one night around dusk. I was a little busy that night and put the box in the garage for a couple of days. I expect if bees had brains they would think it was rather a privilege to be in the same room as my Porsche!

So, I admit, they ended up being placed rather hurriedly at the end of the garden in early May. Hardly worth donning my new camouflage green bee suit to do it — so I didn't. You bee bumpkins say the year begins in September when you feed the little guys, check for disease and see they have adequate brood and stores for the winter. Well, the way I did it I did not bother with all that nonsense. Mine arrived, in a nice cardboard box in May.

I then only managed to open the heaving, humming mass once during June. They seemed a pretty tetchy bunch and I got stung a couple of times. I also had a couple of complaints from neighbours about bees and the children got stung a couple of times while they were in the swimming pool. The day I opened them was pretty hot, and to tell you the truth, I was pretty sweaty in my bee suit so I just had a quick peak and did not bother to lift the frames out of

the big box on the bottom, just looked. They seemed fine.

I had meant to open my WBC (in the lingo now!) again and 'check the brood'. Maybe I could even have looked for the queen cell — whatever that might be. I remember reading something about stores and space, but was it really important? I should have looked out for swarming but my expert friend said that was not usually a problem in the first year. Every weekend I was busy. I work in the City, you know. My weekends are precious; not to mention that the weather has been pretty iffy this year. That long, dry June meant my garden looked quite bare but I trust the bees flew elsewhere to find food. I am sure I read somewhere that they can fly eight miles for forage. You, Mr Porter, being such an expert, will know the answer to that.



Photo by David Wootton.

Anyway, I managed to get down there last weekend and the superannation box (I think that's what you call it) was pretty heavy. I didn't actually go into the bottom box because the bees seemed quite angry and I wasn't really sure what I was looking for. But the super was definitely pretty heavy. It nearly killed me heaving it back on top. I wondered whether I should put another one on and made a mental note to ask my friend.

So I telephoned him later with the good news about the heavy box and he said 'You need a Porter Bee Escape. They make taking the honey off a doddle.'

I reached for that Bible of Beekeeping — the Thorne's catalogue. It says: 'This new plastic escape with accurately spaced stainless steel springs slides apart easily for cleaning. The springs are easy to adjust if necessary and will not rust or corrode. A very old and tested way of clearing your honey supers.' £1 a pair — peanuts to a Merchant Banker like me. I might as well order a hundred. They would be useful in years to come when I expand the apiary.

Oh and while I was on the blower to that nice girl Gill at Thorne's, I ordered a hundred jars. I am sure to need that many at least. I heard that neighbour got ninety pounds from one hive last year and I must be better at it than that country bumpkin! My hive is pristine compared to his! He has been keeping bees for more than forty years and he really could do with some new kit. Even his suit is tatty and boringly white, though, I must say it is always clean.

Anyway the box of Porter Bee Escapes and the gross of jars (144, actually) were delivered in the week. Last weekend I donned that designer camouflage suit once again and pulled on my beautifully clean green wellies to go to the hive and fit these little, rather cheap and nasty looking, plastic things. Took me half my time to light the smoker. That Bumpkin gets his going in seconds. I am sure any idiot can light a fire in a can. Made a mental note to sort that one out. Perhaps, I should buy some special fuel? Oh! And I

forgot to ask my friend if I should put another box on the hive. Well, I thought, there would be plenty of time to do that later and I wasn't sure if I had enough frames to put in another box. Check that later too. I was sure I would be better organised next year.

Next problem was fitting your damned inventions to the throne board (or is it the tiara board?). I needed a hammer in the end. Didn't stoop to calling Bumpkin for help. I clumsily lifted the super box off. The bees buzzed around my suit. Had I zipped up my suit properly? Those bees were right in my face. I placed the throne board on, then lifted the heavy box on to it. I hurriedly put the roof back. I was in a bit of a rush. I could hear the kids in the pool and had promised to join them. But should I have put another throne board on top? What, do you think, Mr Porter?

I meant to go back and attend to the hive in a couple of days but ended up late home from the office (one has to take drinks with clients, you know). When I went back at the next weekend — well Sunday evening actually, I expected the box to be empty. You claimed it was 'an old and tested way of clearing the super.' On that information and as, again, I was in a rush I didn't don a bee suit. Well, as soon as I lifted the roof and, before I had time to turn round and put it on the ground, I realised the superannuation box wasn't empty! It was heaving. There were more bees in it than when I started!

Here could you just clear up a point for me, Mr Porter? Does the shiny side go up or down? This may be where I went wrong. I blame you, though, for the books claim they are easy to fit.

The noise was tremendous! The bees welled up. Thousands — maybe millions — of upturned angry abdomens with, what seemed like giant, scorpion-sized stings is an image I will never forget. The maelstrom mass seemed to have been trapped in the box. Those bees had a whole week of pent up anger as I have never seen it before. I stumbled and almost fell over the roof. I then tried to run down the garden but the wrath-drunk, pulsating swarm poured down the lawn behind me.

I crashed into the trees, flaying my arms in the air to fight off the angry wild beasts. They were caught in my hair and in my clothes. Maybe it was my Lynx aftershave that made matters worse. I put it on to attract the birds, not the bees!

I had to jump into the swimming pool to escape. You can only imagine the effect this must have had on my poor children. I can assure you that none of them will become beekeepers. The ambulance men said that jumping in the pool probably helped to cool the stings. My wife, you understand, panicked at the sight of me careering down the garden with a halo of bees and dialled 999. The hospital was most kind and told me I had a 'non-allergic reaction'. Maybe no allergy but pretty itchy a week later and my swollen face is a bit of a conversation stopper with City clients.

My normally meek mannered wife has decreed that 'the bees must go!' Kindly Mr Bumpkin, who turned up to help the police collect the angry bees, has agreed to remove them from my land and only charged me £100! He said the itching is caused by the protein in the venom reacting with my fat. He said once I had the first sting the pheromone went out to all the other bees to sting me. Interesting but painful. He has also offered to remove my top notch extractor free of charge. I think this is most generous of him as there is so much work involved.

Now Mr Porter, after that disastrous beekeeping purchase, can

you suggest a hobby that would suit me better?

Yours faithfully
D I S Gusted, Tunbridge Wells

Many of you, dear readers, will be imagining Mr Porter's reply. It would probably be based on the five morals of this fictitious tale:

- ❑ Beekeepers should be aware of the dangers of the growing number of people who are taking up our wonderful hobby without proper training or understanding of the commitment involved.
- ❑ Their disastrous purchases could provide a source of cheap, second-hand equipment for real beekeepers. This equipment is usually in pristine condition. The downside of this for many beekeepers making a living out of selling hardware is that it could flood the market.
- ❑ Local beekeepers' associations may need to consider how to deal with this influx of people who only keep bees for a short time. They should have plans for rehousing rescued bees from situations like this.
- ❑ Notice our fictitious banker never mentioned his local association or the need for insurance and only made a passing mention of the dangers of spreading disease.
- ❑ The local beekeeper, Mr Bumpkin, had to step in when the emergency occurred. Many of you will have found yourself in this position.

So, in conclusion, this man should never have bought a hive in the first place; that was his disastrous beekeeping purchase.

Margaret Ginman, Groombridge, Tunbridge Wells

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3. *Bacillus thuringiensis*. Certan® (also B401 and Mellonex®) Certan® is a commercially available spore preparation of the bacterium *Bacillus thuringiensis* which invades and kills all caterpillars but has no reported effect on bees.

- shake the spore suspension well and use a hand sprayer
- spray each side of the combs with a fine mist of the suspension
- dry the frames thoroughly
- stack in boxes and seal for storing

Advantages – very effective against caterpillars. Not toxic or dangerous to handle. Useful for small number of frames.

Disadvantage – no effect on eggs. Relatively time consuming since frames must be dried thoroughly. Expensive for large numbers of frames. Spore suspension can clump and block the sprayer.

4. Acetic acid

Acetic acid is an excellent all round disinfectant for a wide range of pathogens and diseases. As with sulphur, care must be taken not to inhale any of the fumes. Wear gloves and eye protection when using acetic acid. Make sure that 80% acid is used and not glacial acetic acid.

- remove any metal parts and ends from frames
- stack boxes and seal as for sulphur treatment
- place on a wooden or grass base, not concrete or metal
- 80% acetic acid is poured onto pads or into a small plastic container
- use approximately 120ml/super
- seal the top carefully
- the fumes will sink and penetrate the frames
- do not leave for more than 2 weeks to avoid damage to metal parts

Advantages – highly effective against all stages of wax moth, Nosema, chalk brood and other fungal spores. Cheap. Unused liquid stores well. Does not harm honey so can be used on brood frames from hives with Nosema

Disadvantages – toxic fumes. Attacks metal so overexposure can damage the wires in the wax and nails in the frame. It also attacks concrete.

General points

None of these treatments can protect permanently from re-infestation as wax moths are common throughout the year, other than in really cold weather. The only exception is storing the frames in a freezer for the entire winter. Layers of newspaper can help but the stored frames must be inspected at intervals to ensure that there is not a fresh batch of caterpillars.

Do not store drawn combs in plastic bags as they are then prone to mould which is just as damaging.

This leaflet is one of a series intended to help beekeepers and non-beekeepers. If you believe the contents of this leaflet are relevant to you, please seek further advice from an experienced beekeeper or your tutor.

Information is updated regularly – please check with the BBKA web site at: **www.bbka.org.uk** – for the latest information.

Note: The same information is published on our website as a PDF download - please visit **www.bbka.org.uk**

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Wax Moth in the Apiary

There are two types of wax moth, the Greater Wax Moth – *Galleria mellonella* and the Lesser Wax Moth – *Achroia grisella* and both species can completely destroy combs. In the wild, wax moths perform a valuable role as they completely destroy abandoned combs, which may well be diseased. The resultant frass that they produce is unlikely to harbour many bee diseases. It is also unattractive to a fresh swarm of bees looking for a new home.

Wax moths may be found in a live colony or in combs for storage. The stored combs are generally at greater risk. The adult female moth lays her eggs preferably in drawn wax, rarely in foundation, usually finding a crevice around the edge of the frame. On hatching, the larvae, which are very active caterpillars, tunnel through the combs leaving silken webs over the surface of the comb. After a period of pupation, adult moths emerge, mate and continue the infestation cycle. In temperate regions the Greater Wax Moth overwinters as mature larvae and pupae in cocoons. The Lesser Wax Moth has been observed to overwinter in the egg or larval stages.



BBKA – supporting bees and beekeepers

Within the hive

Generally strong colonies are less prone to attack, as the bees discourage them, but they can be found in active colonies, burrowing under the brood cappings.

Adults – may be seen when the lid is lifted. If possible catch them and kill them but they move very fast and their presence indicates that larvae may be present.

Larvae – may be in the sealed brood. Slightly damaged cappings can indicate the presence of larvae burrowing between cells. Uncap some cells and you may find the larvae. Tap the frames and often the larvae emerge. Pick them out with fine tweezers.



‘Bald brood’ – can also be caused by the bees uncapping cells where wax moth larvae have been.

Eggs – are not visible but if larvae have been seen take special care in the next inspection to check for larvae.

If larvae are found examine them carefully to distinguish them from the larvae of Small Hive Beetle. The latter look similar but have small spines on the back and three ‘legs’ underneath.

Floors

Floors – whether open or solid can provide a haven for wax moth. If mesh floors are used over a solid floor, a long handled stainless steel scraper (obtainable from bee suppliers) is an essential. This is designed to reach to the front of the floor when inserted at the back and allows debris to be removed. If open mesh floors are used take care not to leave the insert in for extended periods without removing and cleaning.

Apiary Hygiene

During hive inspections put all wax scrapings into a plastic box or tub and remove from the vicinity of the hive.

Protecting drawn comb from damage by Wax Moth

Frames of drawn comb, both for honey supers and for brood, are very valuable to the beekeeper especially the beginner as they cannot be bought. The bees expend a great deal of energy in drawing wax and a good flow of nectar is required to get the bees to draw foundation. It is therefore important to prevent damage by wax moths of these frames, especially when they are stored in the winter.

Wax moths are attracted to brood comb preferentially as they prefer the larval skins and pupal cases left in the brood comb as food. They can attack any combs in store but prefer the brood. Empty super combs stored wet can be less attractive to wax moth as they are not keen on honey, but are messy to handle. Pupae of Greater Wax Moth can also damage the boxes (as larvae pupate they make burrows in the material). Mature larvae spin tough white cocoons, first gouging depressions in woodwork to attach the cocoons.

A treatment which was in common use but is no longer acceptable is the use of para dichloro benzene (PDB) crystals. This moth deterrent was extremely effective but the chemical can accumulate in the wax and possibly damage larvae and contaminate honey. This product should not be sold or used. Similarly no household moth killer or moth balls should ever be used as they are all based on chemicals that are highly toxic to bees as well as moths, and, as with PDB can accumulate in wax and possibly contaminate honey - an example is naphthalene.



Treatment and avoidance

- Avoid equipment with hidden crevices e.g. combs with split top bar.
- Check parts that bees can't reach, e.g. varroa floors.
- Use a flame torch to destroy eggs in equipment when not in use.
- Don't leave drawn combs lying around.
- Stacking boxes after treatment with newspaper in between each box can help prevent any subsequent invasion by wax moths or restrict their movement between boxes.

Methods of protecting combs in store

1. Chilling and freezing.

If a large chest freezer is available the combs can be frozen and this prevents eggs hatching, kills caterpillars and prevents combs from being re-infested. Suitable for a relatively small number of frames. Needs 24 hours at -18°C to destroy eggs and caterpillars.

- if enough freezer space is available leave in for the winter
- if not, after freezing, stack boxes with frames over a mesh floor with an air space underneath
- put a mesh and cover on the top of the boxes and leave outside.
- in very cold weather any frosts will ensure no wax moth can survive.

Advantages – if freezer is available, cheap, easy and effective.

Disadvantage – as with other methods, once removed from freezer, wax moth can invade in mild weather

2. Sulphur strips

Sulphur is widely used to sterilize brewing equipment and greenhouses. Strips and a metal holder are sold to use for bee equipment. Care must be taken not to inhale any of the fumes.

- stack boxes containing frames on a secure base.
- place an empty box on top
- seal the stack of boxes and either tape all joints or enclose in a large plastic sack or bin
- put sulphur strips in perforated metal container in top box
- light the strips and cover the top immediately
- seal top cover securely
- sulphur dioxide fumes are produced
- the fumes are heavier than air, sink and penetrate the stack of frames
- 2 strips are adequate for 6 boxes

Advantages – very effective. Strips are cheap, metal container costs more but lasts for years.

Disadvantage – toxic fumes. Wax moths can invade again when fumes dissipate.

Exam Results

Record Numbers of Successes in Practical Examinations!

2011 has proved to be a record breaking year for successes in BBKA practical examinations. There are three practical exams; the Basic, the General Husbandry and the Advanced Husbandry and large numbers of candidates have been taking these exams. This is encouraging for the future of beekeeping, helping to increase the standards both of handling and of general knowledge.

The Basic Examination, more properly called a 'Certificate of Proficiency in Beekeeping' is the cornerstone of all the BBKA examinations and is one that all beekeepers should aspire to hold. The exam may be held in the candidates' local branch or association apiary but not using the candidates' own hives. It lasts approximately one hour and involves opening a hive and performing a few simple tasks. Additionally the candidate has to discuss a range of topics which include aspects of disease and general beekeeping. There is no written paper and one of the aims is for this assessment to be as relaxed as possible and for the candidate to learn during the examination. The numbers of candidates taking this examination has increased steadily in recent years and the pass rate is gratifyingly high! Most candidates are new beekeepers with just one or two years experience but a number of experienced members who have somehow slipped through the net also take the Basic. This year 53 associations (including BBKA Individual Members) put forward 888 candidates and 873 of these candidates passed — a magnificent achievement! Also following on from the Basic, a record 53 candidates have been successful in the General Husbandry Assessment this year.

Pam Hunter, BBKA Exam Board

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can be maintained very readily, only requiring cleaning down and recoating.

Varnishes are unsuitable for use on hive parts as exposure to sunlight and mechanical abrasion breaks down the coating and it is difficult to restore.

Note: hive parts that have been treated or finished should be dry and free from odour by airing in the open before the bees are introduced to the hive.

Hive Roofs

Galvanised metal is the most suitable material for long term use as a roofing cover. When the galvanised coating is damaged a metal primer followed by a metal paint can be applied.

Alternatively thin aluminium sheeting can be used as it is corrosion resistant and needs no maintenance, although it is easily punctured if not handled carefully.

Consider using silicone mastic to fix the metal cover to the underlying structure as this means you don't have to make holes in it for nails.

Roofing felt can also be used but it is not very durable. The application of heat reflective paint helps prolong the life of the felt.

Holes or small tears can be repaired using a suitable mastic sealant but it is preferable to remove and replace the whole roof covering.

Care during use and Repairs

The useful life of hive parts can be extended if damage is avoided and repairs are carried out at an early stage.

Damage is commonly caused to top and bottom edges of boxes by the use of poorly made hive tools. This can make gaps for bees and wasps to enter.

Hive tools with thin blades are much easier to separate boxes than those with thicker ended blades.

Damage caused by woodpeckers can often be satisfactorily repaired using wood filler rather than discarding.

General Notes:

This leaflet is one of a series intended to help beekeepers and non-beekeepers. If you believe the contents of this leaflet are relevant to you, please seek further advice from an experienced beekeeper or your tutor.

Information is updated regularly – please check with the BBKA web site at: www.bbka.org.uk – for the latest information.

This leaflet supersedes 'The Preservation of Beehives' (B7 2007 4th edition)

Note: The same information is published on our website as a PDF download - please visit www.bbka.org.uk

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Care of Wooden Beehives

This leaflet gives advice on how to extend the useful life of wooden beehive components for as long as possible in order to recover the initial cost and to provide a return on the investment.

Hives that are dry inside and well ventilated, especially during the winter, provide the honey bee colony with the best conditions in which to develop and prosper.

Wood becomes porous through the effects of age and weathering and retains water. This reduces its thermal insulation properties. Evaporation of this water by wind will cool the hive markedly. Cold hive walls cause condensation and dampness inside the hive. Damp is considered to be a significant danger to the health of bee colonies.



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Wood that is constantly damp is susceptible to fungal attack. Early onset of decay will be aided if the hive is made of non-durable sapwood or low durability heartwood. Stored equipment can also suffer damage, e.g. woodworm, wax moth, rats, etc.

The useful life of wooden beehive components - (hive stand, floor, brood box, super and roof) can be extended by adopting the following good practices:

Choice of wood

Use wood from timber species which have a degree of natural durability. Western Red Cedar is a preferred material. It has good dimensional stability, is light in weight and has some natural resistance to decay and insect attack.

There are other timber species commonly used including red-wood (Scots Pine) and whitewood (spruce), especially in some budget or economy ranges sold by beekeeping suppliers and these may not be so durable, especially for parts that are exposed to weather all year round e.g. floors and brood boxes, although they are adequate for supers. Wherever possible check the components for the presence of loose knots as these may fall out; however reputable suppliers should not have included such material in their premium products. If 'seconds' are purchased these may have loose knots. Some wood can be very resinous and the application of a knotting compound will help the adhesion of a paint finish.

Whichever timber species is selected, if the timber component contains a high proportion of sapwood it will require attention to reduce its decay potential.

Plywood suitable for exterior applications can also be used and care should be taken in machining it to avoid splintered edges. Plywood hives are heavy to handle and may not be able to 'breathe' owing to the layers of glue. Blockboard, MDF or oriented strand board (Sterling Board) are non-durable in exterior uses where a useful service life is required.

Pre-treated timber, also referred to as pressure treated, can be bought from timber merchants or DIY centres but always obtain information on the product used to treat the timber and check whether there are any restrictions in its use for beehives. Ask the outlet for product information.

Design

Hives should be made to recognised designs such as National, Commercial, Langstroth or Smith. Well-made joints will help stop moisture from penetrating the timber.

When assembling or repairing hives using nails, use only galvanized or sheradised nails. Screws are often better than nails in preventing the wood from warping at vulnerable joints.

Bee equipment suppliers sell hives as flat-pack kits. Always follow the instructions and use waterproof glue to ensure strong and durable joints. However, glued joints do not 'give' and any movement of the wood puts pressure on the glued joint, which may split. If water does get behind the glue, the wood takes much longer to dry out. It is almost impossible to replace damaged parts if they are glued. Using screws, rather than nails, can make repair work easier.

Hive stand

Single walled hives, such as the National, should be stood on hive stands well clear of the ground. This keeps solid floors dry and ensures there is good air circulation under the hive.

Hive stands can be permanent structures or moveable with the hives. They can be made from pressure treated wood, metal frames or concrete building blocks. Porous blocks that have



absorbed water may crumble during frosty weather. Ensure that the hive stand is large enough to support the whole hive. A narrow stand can put unnecessary strain on the floor and may cause the hive to collapse.

Placing the hive stand onto a level paving slab ensures a flat and stable base for the hive. The removal of vegetation will increase air circulation and will help to keep the hive dry.

Choice of wood preservative

Any product which claims to be a wood preservative requires authorisation before it can be placed on the market. Before purchasing any wood preservative product you should:

- Check the product label on the container for the HSE Number, which indicates that the product has been cleared for use by the general public (also referred to as Amateur users). If it states for Professional or Industrial use then it should not be used by the general public.
- Carefully read the label and other information on the container and note any conditions of use and whether there are restrictions on the use of the product on beehives. Latest information may be found on the manufacturer's website.

Do not be tempted to use old products which you may happen to have in your shed. They may no longer be appropriate or legal to use. Take them to your Local Authority Civic Amenity site which will have a special facility to deal with them.

Whilst not a wood preservative as such, dipping hive parts into hot liquid paraffin wax is not a recommended practice for most beekeepers because of the high fire risk.

Choice of exterior coating or finish

There are many wood protection products on the market which protect the timber against the effects of weather and give a colour to the timber.

Water-based acrylic paints and stains can be used. They provide good weather resistance but are soft and prone to physical damage. Water-based shed and fence treatments are usually not suitable for application to planed timbers such as those used in hive components. Solvent based paints and stains can also be used.

Whichever of these products you use always remember that there is a risk of blistering caused by moisture being trapped under the paint film if the coating can't breathe.

'Microporous' finishes work well on hives. They are more permeable to allow water vapour to escape through the film without peeling or blistering the finish. They repel water well and are relatively flexible, accommodating to some extent the movement of the wood substrate.

Woodstains can also be used and can be low or medium build according to their solids content. Low build finishes are preferable for migratory beekeeping because they are less liable to mechanical damage and abrasion. Woodstains and microporous finishes

Pondering the Invasion of Hornets

Nina Jackson, from West Wiltshire, posed the following question: 'With the expected influx of Asian hornets likely in the UK at some point I am interested in any research undertaken or consideration given to reducing hive entrances, so that hornets cannot gain entry to bee colonies. In the winter we put mice guards up, and in the wild bee entrances are usually quite small. While mice guards tend to knock pollen off bees on entry, is there a possibility of making the holes large enough for bees to pass through with their forage, but too small for hornets to pass through? I understand hornets are larger than honey bees, but are they able to squeeze through small spaces? It seems to make sense to plan ahead to give our bees a fighting chance against these invaders.' We asked the NBU for their comments.

As BBKA readers will be aware, the Asian hornet *Vespa velutina* is now well established in many areas of France. The latest guidance given to beekeepers by the Association de développement de l'apiculture en Aquitaine, (ADAAO) the Centre national de développement Apicole (CNDA) and the Office pour l'information et la documentation en Apiculture (OPIDA) is that hive entrances need to be reduced, using entrance blocks, to a height of 5.5 mm to prevent Asian hornets from entering. It is the experience of French beekeepers that traditional metal entrance strips are ineffective at excluding *V. velutina*. An entrance height of 5.5 mm will also prevent mice from entering hives so metal strip mouse guards are no longer needed.

Other helpful husbandry practices include maintenance of vegetation around apiaries; tall grass in front of hives hinders the Asian hornets' prey-capture behaviours, limiting their ability to 'hawk' for honey bee workers on the wing. Taking sensible precautions, such as not leaving wet frames in the open after honey extraction, will avoid attracting hornets (Asian or European) to the apiary.

In France *V. velutina* adults are actively flying from spring to late autumn, but the key life stage to eliminate is the mated queen, as just one such foundress can produce an entire colony. There is good evidence that the spreading population of *V. velutina* across France and Spain arose after a single incursion. For this reason, detection and removal

of any *V. velutina*, especially during hibernation, in early spring or late autumn, is likely to have the greatest impact on limiting establishment and spread. Reports from France suggest that in areas where spring traps have been used, subsequent numbers of

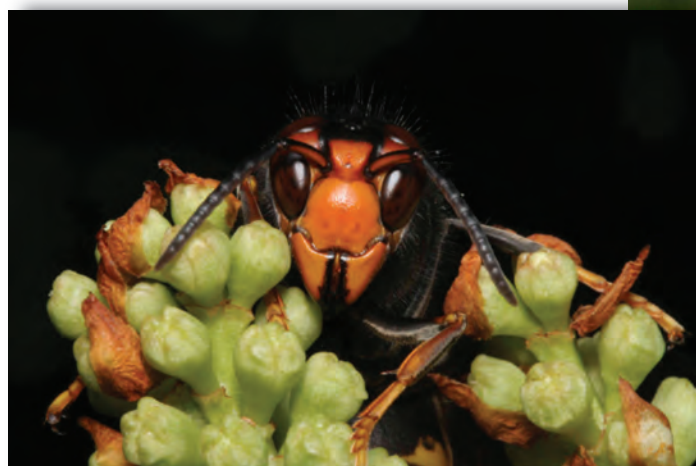
Asian hornet nests are reduced by as much as 97% (two or three nests in trapping areas versus seventy plus nests where no traps have been hung).

A variety of traps are available for catching predatory adult hornets 'on the wing', including Asian hornets. Preliminary comparisons of various designs for use against *V. velutina* in Europe have shown that funnel traps are the most efficient. Hornet traps can be purchased over-the-counter, but French beekeepers are frequently resorting to home made equivalents. These can be made at minimal cost. Most of these share the same basic design:

a plastic flask or bottle, containing a food attractant/bait, over which is inverted a funnel; the insects enter the funnel and crawl/drop into the attractant mixture from which they cannot easily escape; trapped insects subsequently drown. This 'pit-fall' effect can be enhanced by treating inner walls of the trap with talc, thus maximising the numbers of individuals entering and minimising the



V. velutina hunting honey bees. Photo by Jean Haxaire. Jean Haxaire is the entomologist who originally identified the Asian hornet when it first arrived in France.



Above: *V. velutina*, colony founder. **Left:** *V. velutina* head view. Photos by Jean Haxaire, who is the point of contact for reporting sightings in France.

numbers of escapees. Note that the orifice of the funnel should be 7 mm, and no wider, as this will prevent larger native European hornets (*Vespa crabro*) from passing through. An example of basic trap designs can be seen at <http://www.apiculteurs-en-aquitaine.fr/pdf/frelon-piege.pdf>.

At the end of hibernation emergent Asian hornet queens have a raised energy requirement, and therefore show a preference for sweet foods. Sweet baits are thus the most effective for the first captures of foundresses. ADAAQ-CNDA-OPIDA use a mixture of beer and sugar, but other recipes include sweet mixtures of wine, sugar, cassis, water etc.

Dates for hanging trap use will vary with local climate. In Aquitaine in France, the first sorties by Asian hornet queens begin between mid January and late February. French beekeepers place their traps in trees and on hive stands, in and around affected apiaries, as well as at other critical locations such as wood piles, stones, tiles, etc., which are all favourable hibernation sites. Traps are hung at the height of a person.

trap designed and tested specifically for use with Asian hornets. In collaboration with INRA (France) and Aristotle University of Thessaloniki (Greece), Vita Europe Ltd have developed a trap that exploits the fact that when a honey bee colony has been seriously depleted by the hawking activities of predatory hornets outside the hive, the colony's defences collapse to such an extent that hornets can actually enter the hive to plunder the colony's reserves. The non-baited trap fits permanently on the bottom of a conventional bee hive. Asian hornets are lured into the trap by the colony's odour and away from the hive entrance. Honey bees are able to enter their colony normally and access their brood chamber. However, any Asian hornets that enter via the cone-shaped entrances of the trap are led into a cage that not only prevents them from penetrating the colony, but also prevents their escape. Vita is currently arranging international patents and is in the final stages of design and tender. The product (the APIBURG®) is expected to be ready in 2012.

Remember, beekeepers and the public should report any suspect sightings via the Alert System: alert_nonnative@ceh.ac.uk

At present the National Bee Unit is only aware of one in-hive

Gay Marris and Mike Brown, National Bee Unit

The Bee Farmers' Association of the UK (BFA) Situations Vacant

The BFA represents the commercial and semi-commercial professional, beekeepers of the UK. Current membership is around three hundred. The running of the Association is dealt with by the Executive Committee with assistance from some other officers for specialist areas such as education, magazines and spray.

General Secretary

The post-holder will, as a key member of the Executive, be required to seek out and develop long-term sponsorship arrangements that promote and reflect the Association's role as the voice of professional beekeeping in the UK. He or she will be required to work closely with the Executive on all internal functions of the Association. The role will also involve close working contact with the NFU, government bodies and MPs; liaising with other beekeeping organisations and the media, and engagement in European networking at National and International level. Reporting to the BFA Chairman and executive committee, the primary objectives of the post will be:

- representation of the BFA to government, media and other bodies;
- generating sponsorship and fund raising;
- daily administration of BFA business.

The post holder will require:

- Significant experience in a senior administrative role.
- Self-motivation, excellent organisation skills and the ability to prioritise and manage their own workload and that of the Office Assistant.

- Excellent written and oral communication skills that enable the post-holder to communicate effectively with a wide range of individuals, organisations and other bodies.
- To have, or be able to quickly acquire a good grasp of the technicalities of the job including commercial bee farming, government practices, disparate administrative functions etc.
- To be able to work well under pressure and to handle competing demands on his/her time and energy successfully.
- Enthusiasm to promote the aims and objectives of bee farming in the UK.
- To be IT competent with full office skills, including a good working knowledge of MS Office.
- A willingness to work out of regular hours and to travel.

Experience in commercial beekeeping is desirable but not essential as training in the subject can be given. Hours: variable, as required to carry out the job; expected to average twenty-five hours per week. Remuneration: depending on experience and results, by negotiation.

Office Assistant

The post holder will be required to carry out the general office duties of the BFA. He or she will be required to work closely with, and under the supervision of, the General Secretary. Reporting to the BFA Chairman and executive committee, the primary objectives of the post will be to deal with day-to-day administration of the BFA and to support the General Secretary and other members of the Executive in the execution of their duties. The post holder will require:

- Significant experience in an administrative role.
- Self-motivation, excellent organisation skills and the ability to prioritise and manage their own workload.
- Excellent written and oral communication skills.
- Enthusiasm to promote the aims and objectives of bee farming in the UK.
- Accuracy and attention to detail.
- To be IT competent with full office skills, including a good working knowledge of MS Office.
- Flexibility and a willingness to work out of regular hours and to travel.

Hours: variable, as required to carry out the job; they are expected to average two days per week. Remuneration will be by negotiation.

How to apply for either of these positions:

In the first instance, a job description should be obtained from the secretary at john@eclipse01.demon.co.uk or from the Treasurer, Doug Isles, at hudnallsapiaries@aol.co.uk. **Applications should be made by email to: john@eclipse01.demon.co.uk by noon on 31st December 2011**, and should include a curriculum vitae, a covering letter that details how you meet the requirements of the post, and details of two referees, one of which should be your current or most recent employer.

A View of Bees: Language

Do honey bees have language? If a bee makes sounds or carries out actions that carry information that other bees read and understand then they have language. The bee dance is an example of such an action. Having returned from the foraging field it is said that the bee does a dance that conveys to others where the field is and how to get there. It is also said that the bee has been seen to offer a sample of the forage to other bees.

We, as homo-sapiens, learn our language from our parents; we mimic and copy them. We can, and do, learn other languages this way. This method of learning is not available to bees. It must therefore be part of the bee's genetic make-up, and is 'hard wired'; so, they have language.

Brood box volume

It is argued that one must provide adequate volume in the brood box to accommodate the queen's rate of lay. This is not wholly true; what is the queen's rate of lay? In February it is a few eggs per day. In June it is so many she fills one whole side of the frame. To increase the volume of the box by adding frames will not resolve the problem of a high rate of lay in June. The bees swarm when her rate of lay causes her to reach the edge of the frame and lay an egg in each incipient queen cell there. This suggests that crude volume of the brood box is not the all-important factor to be considered. The volume of the brood box could be increased by adding frames; but this would not satisfy the reasoning here. The other two dimensions, length and depth of frame, could be increased, but there will be limits. Bear in mind that the bees want to swarm, need to swarm, and will swarm, or die out. The vibration travels out from the queen and reflects at the wax edges; in so doing it 'talks' to all those that are on that frame. It reflects, and must reflect; this sets a limit to the size of the frame. If the beekeeper, with impressed wax foundation, makes the frame too large, he will defeat his purpose. The queen, as she vibrates the wax, may be viewed as standing on a pile of energy; this moves away from her across the wax as a growing circle. The amount of energy in that circle is fixed and as the circle grows the energy at its edge grows less. The bees, at the wax edges will not respond to a too depleted vibration; no reflection, no layer of wax, no incipient cells. There would be no swarm cells. But, neither would there be a vital message carrier in the hive; the queen and others will not know how big the hive is, and where they are in it. The advancing pulse and its reflection tell them all this. So, there must be more to swarming than reduced brood box volume, and perhaps bees' language has a role to play in this.

My recent re-reading of Adams on queen breeding and mating

Adams wrote of the selection of queens and drones that he had cross-bred to get hybrid vigour. He also wrote of the outcome of

some of those crosses. Some crosses were prone to diseases, others were inclined to swarm, and some were bad tempered. Any one of these factors ruled them out of consideration for further use; each was discarded.

He said they swarmed a lot, but did not explain why. Let us use the foregone hypothesis to examine why swarming takes place. The vibration on the wax; the reflection of that vibration at the wax edges; the increased amplitude of vibration at those places; the laying down of a thick layer of wax there; the construction of incipient queen cells on those thick layers of wax; the delayed activation of those incipient cells until the queen's rate of lay is at its maximum and carries her to the edge of the wax - it is then that the hive is full of brood. Then and only then, when the queen cells are capped, do the bees and the queen depart in a swarm. Which parts of the hypothesis have failed and should, therefore, be rejected? Adams did not say. Perhaps all the forgone suggestions are wrong, but then we would be left with nothing. So why do bees swarm at those times?



A swarm settled on a tree trunk. Photo by David Wootton.

Earlier in this discourse, language was considered, and the bee dance was used as an example of a bee passing information. Having returned from the forage fields a bee tells other bees how good it was, where it was and how to get there; all contained in a dance. Let us accept that evidence and apply our reasoning to the inclination to swarm of one of the experimental crosses.

The queen, let us call her A, was brought from distant lands for the purpose of experiment. She was mated with a local drone; let us call him B. He would die in the process of mating. Their worker bee offspring would be AB. The drones would be A; being born of unfertilised eggs.

Everything proceeds normally in the hive; eggs are laid, grubs are fed and then after nine days the grubs are fully grown and the bees cap their cells. Is this the clock that marks the time for the queen to depart to a new surface? In the case being considered,

why did she not go; did the bees fail to tell her? Perhaps the language of those bees is B, and this queen's language is A. Did she fail to understand them and continue to lay eggs on that frame until she reached the edge of the wax, where the incipient cells would have been laid? Hence the early swarm.

The queen cells left behind contain AB grubs so the future queen will be AB; so when mated with Tom, Dick or Harry local B drones the offspring will be AB+B_s. The propensity to swarm is no longer expressed. If this is so, it suggests that language is, carried forward by the drone, not the queen.

Ivor Clayton, Bournemouth and Dorset South BKA

Registration of Beekeepers' Honey Production Premises

The BBKA continues to receive questions (sometimes from rather worried beekeepers) regarding the 'registration' of their premises. This is usually as a result of a 'demand' from the local Environmental Health department. The BBKA engaged in considerable discussion with the Food Standards Agency on this topic in 2008 and 2009 and an agreed position is available on the BBKA website. This article summarises this position. It should be emphasised that nothing expressed in this article has been tested in any UK court.

1. The legislation.

The Food Hygiene (England) Regulations 2006 (SI 2006 No.14) became law on 11 January 2006. Equivalent Regulations exist in Scotland, Wales and Northern Ireland. These Regulations include, *inter alia*, a general requirement for the registration of 'food businesses', and lay down general rules for food business operators to follow during all stages of production, processing and distribution of food. Registered premises are inspected on a rolling cycle. This legislation is the UK implementation of EU Regulation No. 852/2004 as a result of our obligation to the EU.

2. How is the legislation applied?

As is often the case in the UK although the government enacts legislation the responsible department or agency is less forthcoming on guidance to the public. In the UK the usual approach is to leave it to each Local Authority to interpret the legislation in its own way resulting in considerable differences of approach. This is, sadly, the case here; there is no systematic guidance from the UK government. However, the EU is better at this and did publish guidance to its 'parent' regulation. This is available at: http://ec.europa.eu/food/food/biosafety/hygiene_legislation/guidance_doc_852-2004_en.pdf and is worth reading. It is generally accepted that this guidance would form part of any consideration in a court of law, although it does not have the force of a statutory document in its own right.

3. What does the guidance say?

- a) It is concerned with 'primary production' and 'primary products'. Simply put, this is production of foodstuffs 'from the soil, stock farming, hunting and fishing'. It explicitly includes beekeeping and honey production, BUT honey processing by any form of 'co-operative' enterprise is not regarded as primary.
- b) The Regulation explicitly does not apply to small quantities of primary products supplied directly by the producer to the final consumer or to local retail establishments directly supplying the final consumer.

A meaningful interpretation of what constitutes a 'small quantity' of primary products can vary enormously from product to product. The EU regulations do not permit Member States to quote 'specific quantities' in law. However, in general terms, the notion 'small quantities' should be broad enough to allow:

- ▣ Farmers to sell primary products (vegetables, fruits, eggs, raw milk etc.) directly to the final consumer e.g. farm gate sales or sales at local markets, to local retail shops for direct sale to the final

consumer and to local restaurants.

- ▣ Individuals who collect products in the wild such as mushrooms and berries to deliver their yield directly to the final consumer or to local retail shops for direct sale to the final consumer and to local restaurants.

Pursuant to Article 1, paragraph 3 of Regulation (EC) No 852/2004, it is up to Member States to further refine the notion of small quantities depending on the local situation, and to lay down under national law the rules necessary to ensure that the safety of the food is guaranteed (risk based approach). As far as I am aware, no such guidance exists in the UK.

- c) The guidance deals with 'Traditional methods of production': 'In the Member States food may be manufactured in accordance with longstanding traditions that have proven their safety although not always fully in line with certain technical requirements of the Regulation. The Regulation recognises the need for maintaining these traditional methods of production, which are proof of the cultural diversity of Europe and provide, therefore, for the flexibility needed by food businesses.'

There is no intention in the context of this document to proceed to making an inventory of the traditional methods of production in the Member States. It is up to the competent authorities to take the necessary initiatives or act on possible requests from food businesses for flexibility.'

4. Discussion

From the above it would seem that the bulk of small-scale honey production in England can be argued as exempt from the 2006 Regulations and that Registration by the beekeeper is not required, on the basis of:

- a) Article 1 paragraph 2(c) 'small-scale exemption' and
- b) Flexibility/traditional methods of production: 'allowing current practice to continue, ... achieving objectives of the Regulation.' Since most honey production in the UK follows 'traditional methods' and has proved itself to be capable of producing 'safe food' the EU concerns with flexibility also suggest that there is no need to change the basis of small-scale honey production in the UK.

The BBKA recommends that this discussion is used to respond to any request to register received by a beekeeper.

5. Keep it clean

None of the above should be taken as an endorsement by the BBKA of any bad practice in honey production. The pressure for high quality safe honey from the customer should be our guiding light. Remember that the Honey Regulations 2005 and other food quality/ safety legislation provide ample grounds for prosecution when honey which contains debris or other contaminants is sold to the public.

Chris Deaves, Chairman Education and Husbandry

On the Book Shelf:

Beekeeping — A Novices' Guide

Beekeeping — A Novices' Guide
Author: David Wootton
Edition: Second; 152 pages; 2011
ISBN: 978-0-9566877-1-5
www.beekeeping-book.com

In recent years there has been a considerable increase in the attractions of beekeeping. The membership of the BBKA has risen sharply and there is great demand in many beekeeping associations for classes to encourage and support novice beekeepers. It is one of my privileges to currently be responsible for a lecture series where sixty new beekeepers are eager to learn more about the craft. One of the most regular questions that I get asked is: 'What book do you recommend I read?' Everyone has their favourite book and in recent years I have unhesitatingly recommended Ted Hooper's fine book: *A Guide to Bees and Honey*. But there is a new kid on the block — and I now commend to all beginners that they should read David Wootton's *Beekeeping — a Novices' Guide* (First ed. published in 2010; ISBN 978-0-9566877-0-8; pp128).

David Wootton clearly outlines his aim in writing this book to his potential readers in the introduction: 'Most beekeeping books are written by experts who assume that you know something about beekeeping ... *this book is not an expert's view on how to keep bees, there are plenty of those ... this is an aid to discovering the pleasures of how to keep bees written in layman's language by someone who only a short while ago was in the same position you are in now.*' There is no doubt, in my mind, that David Wootton has more than succeeded in fulfilling this aim, because, quite simply, this is an outstanding book. David is an extremely accomplished professional photographer and thus the standard of illustrations and photographs are of the highest quality. Every beekeeping operation is fully described and illustrated with a superb accompanying photograph. Nothing is assumed and everything is explained in a clear and direct manner. There are handy boxes of text on most pages containing 'Hints and Tips'.

The book outlines a beekeeper's experiences during his first year of keeping bees, with all the fun and excitement that sometimes more experienced beekeepers have forgotten. David Wootton begins with 'getting started'; he then moves on to the hive and other equipment needed by the beekeeper. The book then gives one of the clearest outlines of the life cycle of the honey bee that I have read. The location of the hive is discussed, followed by how to open the hive, how to feed the bees and what should happen during routine inspections. The delights and challenges of

swarming are described, and this is followed by chapters on extracting and presenting honey. There are two pages that give a month-by-month list of things to remember during the 'beekeeper's year'. I particularly liked the chapter at the end of the book called 'The End' — when the author says, 'If you have got to this stage, congratulations you are a beekeeper'. This phrase captures the author's desire to encourage new beekeepers and also his realisation that he still has much to learn. David Wootton knows well enough that there are many aspects of beekeeping that he could have added to his book, but as a description of the first year of experiencing beekeeping this book cannot be matched for its clarity and sense of excitement. The book concludes with a five page glossary of beekeeping terms and expressions.

Since it was first published in 2010 the book has attracted its fair share of criticisms. David Wootton has addressed these in the second edition, published on 5 November 2011. David Wootton writes: 'I have received numerous comments from readers who were not novices, some saying what I wrote was wrong and others saying it was correct. Some criticised me

for writing the book in the first place as a novice without any beekeeping experience. As I have pointed out to them, they have missed the point of the book; it is written *by a novice for novices* to demonstrate that taking up beekeeping does not need to be complicated.'

In the second edition the text has been improved by the author using the services of a professional proof reader. The second edition has also benefited by suggestions made by more experienced beekeepers. The author has added more details and has rearranged the chapters. Two new chapters on frames/foundation and pollen have been added. The book contains the experience of another year of beekeeping, but not at the expense of losing the freshness and vitality of the first edition. There are plans to produce an e-book version of this second edition.

Of course there are things in this book that I would do differently, e.g. I would prefer that more hives were discussed than simply the National hive, but my personal preferences take nothing away from the very considerable achievement that this book represents. This book does exactly 'what it says on the tin' — it is a novices' guide written by a new beekeeper. Without hesitation I commend this book to my students and to those who it is my privilege to mentor as they start out on the beekeeping journey that David Wootton so admirably describes.

Dr Stephen Palmer, FGRS FLS, Master Beekeeper

Learning from Other Associations: *Building Hives*

I think Dr Butt in his letter in *BBKA News*, September 2011, has a point that the start-up cost of beekeeping could be a disincentive for many potential amateur beekeepers as I have also noticed cost constraints can dissuade some people from taking up the craft.

Even when I started beekeeping 36 years ago the prices of manufactured hives, although a fraction of the present cost, made starting up a financial consideration and the dogged use of the ubiquitous National hive in England means that secondhand ones of these may not be all that cheap. Because of such considerations I took a hive building course in the 1970s under the tutelage of John Cosburn at the beekeeping department of Hampshire College of Agriculture at Sparsholt, now unfortunately closed.

Reclaimed, reused and recycled

From starting beekeeping I have built all my own wooden equipment as well as some equipment made out of metal, and with



Equipment can be made from many recycled materials providing you remember to prepare all surfaces thoroughly where bees can come into contact with them. Photo by Chris Coulson.

wax from my home-built solar extractor I continue to cast my own foundation. Most importantly I have mainly used reclaimed materials such as parts of old wardrobes, beds, floor joists, floorboards, shelves (metal and wood), sash windows, mesh from old 'meat safes' etc — the list is endless. Of course such wood needs preparing (cutting to size, planing etc) but much

Victorian timber obtained during house renovations is of excellent quality; though picking the appropriate timber is important for both 'workability' and weight — and watch out for nails and screws!

Examination and preparation are key

Surfaces must be prepared where bees might come into contact with them. Old paint etc is generally removed in preparing reclaimed wood, though on the outside of the hive I have never found it a problem — except for the colour! Most preservatives don't penetrate far into the wood and shaping etc usually serves to remove them. You can tell a lot about chemical penetration into wood by looking at the newly cut end of it. Of course using wood that has obviously been infused with 'creosote' might be asking for trouble. Note, however, if you see material that looks useful in a skip you should ask permission before taking it. I have always found people more than willing to

donate old wood for beekeeping enterprises to the extent that I am now contacted when people are about to discard any that might be useful to me. After a time you develop an eye for potentially useful discarded material and build up a stock of it, though over recent years I have noticed that good deep 'planks' are harder to find and I have sometimes had to resort to jointing to make very deep broods. Recently the East Yorkshire and North Lincolnshire Co-op Committee kindly supported my efforts of introducing hive building from reclaimed materials to beginners and they have asked I run the course again.

Benefits aplenty to be had

All this has provided me with the following: inexpensive bespoke beekeeping equipment (some is over three decades old and still very functional); the feeling I was 'helping the environment' by recycling; the knowledge to help new beekeepers to start up more cheaply and in the process it has given me a lot of enjoyment!

I know that not everyone is 'practical' but all you really need is a bit of determination and the ability to measure and saw straight (measure twice, cut once!). Power tools are handy and spatial awareness and problem solving are useful attributes. Although mistakes will be made most are correctable. However, whatever hive you build you should use the correct measurements so that the proper bee space is maintained. It is important to concentrate at the certain times as I recently found to my cost when I built a 'nuc' while trying to listen to the India v England Test Match and forgot to put an entrance in it!



Fruits of my labours: bespoke nucs ready for next season. Photo by Chris Coulson.

'Chip off old block' comes to mind as my daughter and her husband have recently taken up beekeeping and build their own equipment, which gives them an interesting common hobby at a reasonable price.

Dr Chris Coulson, Beverley BKA

BBKA Finances: An Overview

Over the past few years the BBKA has had a rapid increase in its membership and the profile of the honey bee and beekeeping has risen. The finances of the BBKA have undertaken a similarly rapid transformation and this article seeks to explain where the BBKA's money comes from and where it is spent.

Income

Analysis of the BBKA net income streams shows that members' capitation is by far the most important as shown in Figure 1.

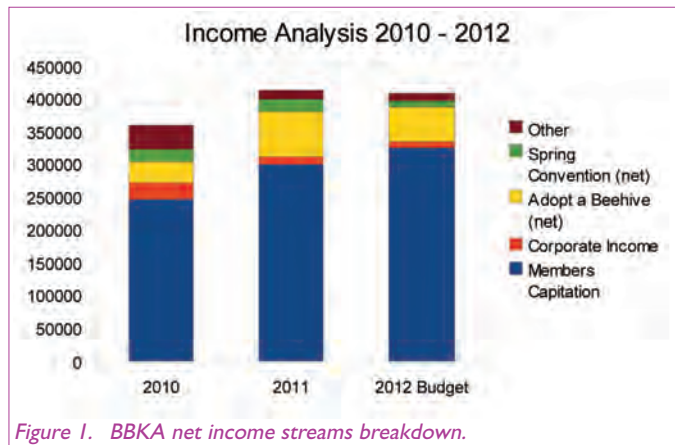


Figure 1. BBKA net income streams breakdown.

However, if we gross up the other sources of revenue that we typically show as net, such as the Spring Convention, the Examinations' Board and the Adopt A Beehive scheme to show their income rather than the contribution they make, we see that for 2011 although members' capitation is still the biggest element it is now only 44% of the receipts of the charity. Total gross income of the charity is now around £680,000 for 2011.

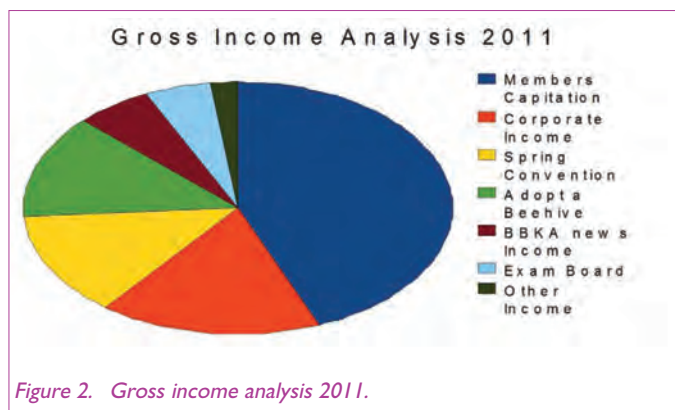


Figure 2. Gross income analysis 2011.

The concentration on alternative income streams has been an important focus of the work of the BBKA trustees in the last few years, enabling funds to be raised for research, education and other activities from sources other than the membership. This has enabled the trustees to enhance the benefits provided to members, such as moving BBKA News to monthly full colour, and to put more money into education and research activities.

Expenditure

In terms of where the money is spent, a gross analysis is shown in Figure 3. In addition to the direct member and public benefits, a good proportion of the HQ salaries and costs relate to the indirect costs of providing these services. This can further be analysed in

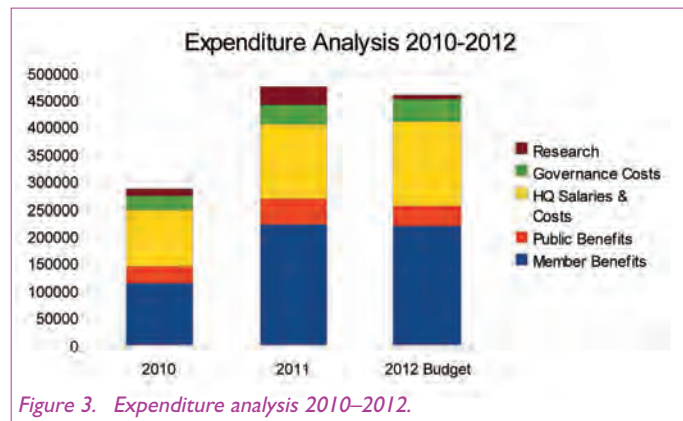


Figure 3. Expenditure analysis 2010-2012.

terms of benefits and costs per member. While capitation has increased from £13 to £14 during the period under review, as can be seen, direct members' benefits have risen by more than this.

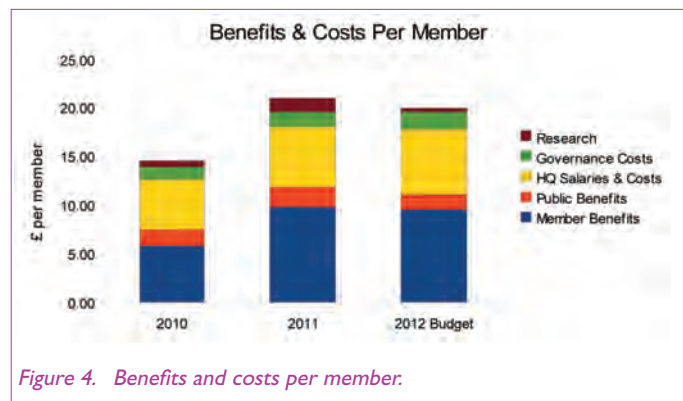


Figure 4. Benefits and costs per member.

Figure 4 shows that of the current £14 capitation rate almost £10 is now being spent on direct members' benefits. This compares with £5.50 in 2010. The main reason for the rise in 2011, which is projected to continue into 2012, is the increased spend on both BBKA News and educational activities such as Course in a Case (CiC) and regional training activities. The detailed split for 2011 is shown in Figure 5. Total expenditure per member is now running at around £20; well in excess of the capitation as other sustainable sources of income are established.

Conclusion

During the past few years, both membership and other income have risen substantially. This has enabled the BBKA to embark on a number of activities, in particular increased expenditure on research and educational activities by using these other sources of funds. Partially as a result of this, benefits to members have increased substantially over the period and are forecast to remain at this higher level during 2012.

Martin Smith, BBKA President

Notes

- Please note that this article is not a substitute for the full accounts and detailed budgets that are sent to delegates attending the Annual Delegates Meeting (ADM) held each year in January. This article takes information from different sources and may differ slightly from the figures in the accounts in the

Detailed Split of Member Benefits 2011

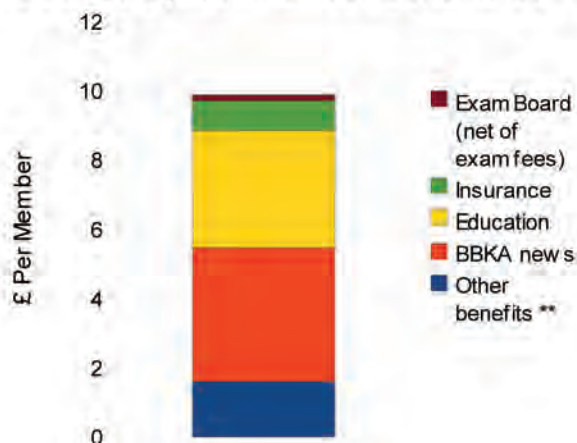


Figure 5. Detailed split of member benefits. **"Other benefits" includes items such membership cards, year books and the costs of the ADM and forum.

interest of clarity. In particular the separate allocation of funds to dedicated reserves for such items as research has been ignored.

- Summary financial information about the BBKA is displayed on the charity commissioner's website www.charity-commissioners.gov.uk (the BBKA number is 212025).
- Full accounts of the charity are available for members' inspection in the members' area of the BBKA website in the section that deals with the ADM papers.

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BBKA ADM — 14 January 2012

ADM Nominations

Nomination for President

Martin Tovey

Nominations for the Executive Committee

There are four vacancies by rotation for three years, one vacancy for two years and one vacancy for one year.

Kenneth Basterfield, Alan Bezzant, Ian Homer, Alice Hunter, Tim Lovett, Margaret Murdin, Peter Sutcliffe, David Teasdale, Clive Watson and Angela Woods.

Nominations for the Examinations Board

There are three vacancies for three years:

Gerald Collins, Dr Ivor Davis, Kenneth Edwards and Joanna Schup.

ADM Propositions

The propositions listed below do not include their supporting notes. These will be included with the ADM papers that are sent out to Area Association Secretaries and ADM Delegates. They will provide the background to the propositions

1/2012 Middlesex BKA Proposition

This Association asks the BBKA to formulate a policy for the use of 'Natural Beekeeping' to take into account the management methods specific to this approach to beekeeping and to the impact that this may have on the health and welfare of bees.

2/2012 Middlesex BKA Proposition

Following the success of previous campaigns, we call upon the BBKA to build for the future and allocate increased resources to support associations in the training of aspiring beekeepers and the education of the public in ways that may help honey bees.

3/2012 BBKA Executive Committee Proposition

That the BBKA invites all its members to pay a voluntary donation equivalent to the price of a jar of honey to the BBKA Research Fund together with their capitation payment and collected by the Area Association, starting with the 2011–2012 capitations payable in April 2012.

4/2012 BBKA Executive Committee Proposition

That the BBKA Constitution clauses 4.2 and 18.1 be amended as follows:

4.2 to read 'the Executive Committee (EC), which comprises the Trustees, elected by the Delegates' and 18.1 to read 'At any time the EC shall comprise a President and a maximum of twelve other Trustees, all of whom are elected at a Delegate Meeting to be members of the EC, except that an election under clauses 15.2 or 18.3.7 may be postal'.

5/2012 BBKA Executive Committee Proposition

That the BBKA Constitution be amended to create a Junior Membership category as follows, and furthermore, that the capitation rate shall be equal to half that of a registered member.

Add clause 7.11 — Junior Members: Individuals under the age of

18 years, for whom a membership fee has been paid to their AAM or one of its component associations and in respect of whom a capitation is subsequently paid to the BBKA and for whom a contact name and address has been supplied to the BBKA. Junior membership shall cease at the end of the BBKA Financial Year in which the Junior attains the age of 18.

In Clause 8.1 delete the words 'Registered Members, Partners Members and Country Members' and substitute the words 'Registered, Partner, Country and Junior Members'

In clause 8.2.1 delete the words 'Registered, Partner and Country Members' and insert the words 'Registered, Partner, Country and Junior Members'

In Clause 10.1 delete the words 'Registered Members, Partner Members or Country Members' and insert the words 'Registered, Partner, Country or Junior Members'

In Clause 10.2.3 delete the words 'Registered, Partner and Country Members' and insert the words 'Registered, Partner, Country and Junior Members'

Add new clause '11.5 Junior Members shall not be eligible to serve as Delegates to the ADM.'

At Appendix A, add Junior Member with benefits of BBKA News, Events & Advice and Representation & Facilities.

6/2012 BBKA Executive Committee Proposition

That the BBKA Constitution clause 10.2.2 Arrears of Capitation be amended to read:

If any AAM is in arrears with its capitation fees payable to the BBKA by more than eight full weeks, the General Secretary shall issue a written 'Notice of Arrears'. If the AAM fails to settle the arrears in full within four full weeks of such notice, it shall be suspended from membership, forfeiting all the benefits thereof, until the arrears are paid. Neither lapse nor suspension of membership will cancel the debt of the arrears.

7/2012 BBKA Executive Committee Proposition

That the BBKA Constitution clause 16.2.5 be amended to read:

Only the Trustees have the right to vote. In the case of an equality of votes, the Chairman of the meeting shall have a second casting vote.

8/2012 BBKA Executive Committee Proposition

That the BBKA Constitution adds a sub clause 19.5 to read:

The Trustees have the power to expel a Trustee if s/he is deemed to have engaged in conduct considered disreputable or opposed to the general interests of the BBKA or is in breach of the Trustees' Code of Conduct. In such an event, the Trustee will have the right to be heard at a properly convened meeting of Trustees, held prior to any such expulsion and the expulsion, shall only take effect by a two thirds vote of the Trustees present, the quorum for such a meeting of the Trustees being two thirds of the total number of Trustees excluding the Trustee under consideration.

Business Corner

From the Boardroom

The last Executive meeting of the year is always a frenetic occasion with the normal agenda but also the preparation for the ADM, and it is pressured by the timetable required for December BBKA News and the distribution of the ADM papers.

In the weeks leading to the November Executive meeting Trustees and staff are also extremely busy with preparation of reports, year end accounts are subject to audit, and decisions are taken with regard financial planning for 2012 plus estimates for 2013 and 2014 all of which need to be discussed and agreed, and then presented to the Trustees for sign off.

A significant amount of time was also given to discussing the education and training strategy of the BBKA presented by Chris Deaves and Martin Smith. Trustees spent a lot of time assuring themselves that they fully understood what was being proposed and the associated costs.

Detailed discussions were then held on the propositions being presented by the Trustees and those received from the membership; each one needing to be fully understood and Trustees were tasked to prepare draft responses.

By 4pm on the Saturday afternoon Trustees and Executives attending the meeting had probably seen enough words and heard enough arguments both for and against topics to be happy when the meeting closed; this Chairman certainly was.

Brian Ripley, Chairman BBKA

BBKA Enterprises Ltd

The lack of a viable and up-to-date website since early this year continues to present us with lost opportunities, as on-line sales have been non-existent since the old site was taken down. Members, however, are continuing to purchase directly through the NBC. Selecting a new fulfillment house, sourcing products, photographing and optimising images, and populating the website is a mammoth task which Jane Moseley has bravely taken on in addition to her other responsibilities.

Red (Improvers) and Green (Proficient) Course in a Case (CiC) are now available and NBC are dealing with orders after the delays in product sourcing for two items.

The long awaited virtual hive update is now available as a nucleus of five double-sided frames covering disease, queen cells and, by popular request, enlarged images of workers, drones and a queen. Prices will be £145.00 per set including VAT and postage to UK mainland addresses.

Roger Cullum-Kenyon,
Chairman, BBKA Enterprises Ltd

Welcome to a New Member of the BBKA Office Team

After two years working for BBKA Jan Fellows has decided that she needs more time to pursue her many other interests. Replacing a Jan with a Jan, Jan Alcock is joining the BBKA office team as Admin Assistant, after taking voluntary redundancy from Warwickshire Police, where she worked for the last ten years in their Road Safety Department. Before that she worked in both the public and private sectors in a variety of administrative and secretarial roles. Jan is married to Mark and they have two grown up sons. They live on the outskirts of Coventry, in an ex-miners house which they have gradually renovated, with their collie Jess, ginger tom Bill and five chickens. Jan enjoys gardening and is hoping for more success from the vegetable plot that she started this year. She regularly attends shows and craft fairs and is looking forward to learning about bees and beekeeping.



BBKA Website Shop Launch



We are pleased to announce that the new BBKA 'Webshop' on your BBKA website is now open for business just in time for you to do some Christmas shopping.

When you look at the Webshop, you will see products of a good quality at affordable prices. This is the start and more items will be added in the future. Happy shopping!

David Teasdale,
Chairman BBKA Website Working Group

Preparation for Spring 2012

BBKA are seeking photos of swarms and swarm collectors for an awareness campaign. If you have images that we could use, then please email them to: bbka.info@bbka.org.uk with details of where and when if you have the information and the photographers name.

Diary of Events 2012

Starting late January. Beekeepers and microscopes: preparing for the BBKA Microscopy Exam. Three half-day, weekend training sessions at University of Bath. E-mail for details stevenmynard@sky.com Tel: 01373 300 748

18 February. Somerset BKA Lecture Day at Kings of Wessex Academy, Cheddar. Dr Jim Tew, Graham Royle, NDB, Dr Gay Marris, Nic Charlton B.Sc. Details form Caroline Butter 01934 742075 E-mail: okapi.bhive@uwclub.net

Saturday 31 March. LBKA, Lincoln District. Sale of Bees and Equipment. From 11am, County Showground, Scampton, Lincoln. Details from: Alan Campion 01522 522679; Bill & Jenny Williams 01522 730365 or Jonathan Korejko 01526 378222.

20-22 April. BBKA Spring Convention 2012 at Harper Adams University College Campus, Newport, Shropshire.

Business Corner

Beekeeping Research and the BBKA

The honey bee has been widely studied and yet, as we have seen in recent years, there is still much to learn about the factors that influence bee health. For at least the last one hundred years beekeepers have experienced periods of increased colony losses especially in the last two decades with the arrival in the UK of *Varroa destructor*.

The response to the increase in colony losses has been the establishment of the Healthy Bee Plan (HBP) which seeks to involve all stakeholders in its implementation. The BBKA is represented and actively contributes to all the working groups concerned with the implementation of the HBP. In addition, the Insect Pollinator Initiative has been established by several funding agencies and research on honey bee-related issues feature in the research projects that are currently underway.

Recently, in response to the requirements of the National Audit Office, Defra has established a panel charged with reviewing honey bee disease control legislation, its implementation, effectiveness and value for money, and will make recommendations in due course. The BBKA participates in the work of this panel. As the panel reviews each disease and condition it identifies knowledge gaps. How these gaps will be filled is yet to be determined. Both the HBP and the Disease Control Review are identifying appropriate work, much of which is likely to be applied research, and experience has shown that even in better economic times such work is unlikely to attract government funding and to fill the gap we as beekeepers need to find ways to help get this research done.

So far the BBKA has received contributions from sponsorship and donations for our Research Fund and we gratefully acknowledge them. These monies have been used to help fund research into a number of topics which the BBKA has identified in its *Research Concepts Document*. A very effective use of research money is to help fund PhD studentships in partnership with other funding bodies. The BBKA Research Fund is currently supporting the following research projects:

- An aspect of the hygienic bee project at the University of Sussex.
- The work of Ron Hoskins in the scaling up of the numbers of hygienic bees within a geographical area.
- The presence of pesticides in bee hives at the University of Keele.
- Improving honey bee health by enhancing the palatability of food supplements at the University of Keele.
- A survey of varroa resistance to synthetic pyrethroids in the North of England being carried out by beekeepers from BBKA member associations.

The BBKA has a limited capacity to carry out research itself, and following the wishes of last year's BBKA Forum the Executive aims to involve the membership. So far this has been successfully achieved and we welcome ideas for new projects from members. We seek to initiate new projects based on our *Research Concept Document*. Usually we are approached by third parties with proposals. The Technical and Environmental Committee then

considers the merits of the project and whether it meets our requirements before making a recommendation to the BBKA Executive for their decision. Some areas of research which the BBKA have identified as being important include:

- The optimisation of the use of thymol-based products in the treatment of varroa.
- The treatment and control of Nosema.
- Increasing the understanding of queen quality and mating issues, through the use of bee sound recording technology.
- Investigating if there is still resistance to synthetic pyrethroids in varroa in the UK.

Our research work will need ongoing funding support and input from beekeepers as well as support from sponsors and the public. Appropriate and successful research will provide answers and guidance to help us work with and manage our bees more effectively and improve the health status of our colonies.

Dr David Aston,
Chair of Technical and Environmental Committee

BBKA Slide and Video Library

Did you know that BBKA have a slide and video library? It is not just slides and videos; it also includes PowerPoint presentations and DVDs. If you give talks to non-beekeepers or to your own division and want some slides or a film to back up your talk, have a look at the BBKA Slide and Video Library. Subjects cover everything from skep making to queen rearing, disease identification, pesticides, making flowers and wax candles, and even hive lifts. They vary from thirteen to eighty slides per pack and most are in colour.

Most of the slides have been transferred to PowerPoint, and the videos are being transferred to DVDs. If a title is not available in PowerPoint or on DVD it can be transferred on request.

If you know you are giving a talk and you want to borrow a set, give plenty of notice in order to make sure your request is available and you have time to look through the slides before your talk. A catalogue can be posted to you at a cost of £1.50 or emailed for free, or you can find it on the BBKA website. Hire fee includes the outward postage and sent recorded delivery. You have to pay the return postage. Please allow at least two weeks to receive your request — and payment with order please.

If anyone has any slides or DVDs that they have made and would be willing to loan them to the BBKA Slide Library, please get in touch. If you want to know more you can email me on bridget_knutson@yahoo.co.uk and I will do my best to answer questions.

Bridget Knutson,
BBKA Librarian

Business Corner

Honey Harvest Hit by the Weather

The BBKA Annual Honey Survey shows that variable weather has affected this year's honey crop. Drought, heavy rain or wind are natural conditions which hinder honey production and this summer included them all. A cold summer can have more impact on the honey bee than a cold winter.

1,295 members responded to the survey, which shows that the amount of honey this year has decreased by 8% year-on-year with each hive producing on average 29 lbs of honey this year compared with 32 lbs in 2010. The combined output from all beekeepers, commercial and amateur, accounts for one fifth of the honey consumed in the UK highlighting how far from self-sufficient the UK is in honey production. Among beekeepers who reported less honey this year the top three factors were cited as:

- ❑ extra long June gap 43%
- ❑ drought 40%
- ❑ cold in July 38%.

Early spring temperatures caused plants to blossom earlier and this produced an unusually long June gap. Lower rainfall affected

2011	Average lbs of honey	Honey Index	Percentage change from 2010 average
Total (all beekeepers)	29.4	100	
East	34.7	117	17% more
London	25.8	88	12% less
Midlands	30.6	104	4% more
N East	26.5	90	10% less
N West	24.9	84	16% less
S East	29.3	100	
S West	29.5	100	
Scotland	20.3	69	31% less
Wales	31.6	107	7% more
N Ireland	34.7	118	18% more

the quantity of blossom produced by trees and flowers which magnified the impact of drought conditions in some parts of the country. London beekeepers reported among the largest regional decreases in honey volume this year with 25.8 lbs of honey per hive, 12% less than the national average. Other regions with lower than average honey include the north east with 10% less and the north west with 16% less.

Brian Ripley,
Chairman BBKA



International Bee Health Symposium 2012

The Symposium will be held on Saturday, 24th March, 2012 at the Citywest Hotel, Dublin, Ireland.

Discounted Early Bird Registration

A special discounted registration of €50 is available until Friday December 16th 2011.

To find out more and to register for the meeting, please visit www.beehealth2012.ie

Or email the Symposium Secretariat on beehealth2012@mci-group.com

As the decline in the world bee population reaches critical levels, a conference between the beekeeping community and top level scientists will take place in Ireland next year to discuss how scientific innovations can be applied within the beekeeping sector to halt this decline.

The International Bee Health Symposium, the first of its kind, will feature roundtable discussions between beekeepers and leading scientists with the aim of transferring knowledge between the two groups, creating practical solutions to dramatically reduce colony loss.

The topics of discussion will include;

- > Varroa
- > Foul Brood
- > Nosema
- > Coloss

A COLOSS Workshop is expected to be held directly prior to the meeting, giving a fantastic opportunity to discuss the implications of the results of the research done over recent years.

Library Archive Request

Members will be aware that we have transferred a number of 16mm films to DVD. These are available via Bridget Knutsford, the BBKA Librarian. We also have in our possession a number of ¼ inch open reel tapes of various talks and lectures that we would like to transfer. To help with this, we would like to borrow (over the winter) a reasonably high-quality open-reel tape recorder. Ideally, this should be a 4-track (stereo) machine, with all three standard speeds and 7 inch spools. We will connect this to a computer to make digital recordings.

If you have such a machine and are prepared to loan it for a few months, please contact Chris Deaves, via the National Beekeeping Centre. We also have a number of cassette recordings but these we have a machine for already!

Chris Deaves,
Chairman of Education and Husbandry Committee

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Your Letters



Dissolving Sugar

A quote was included in the article 'Feeding Bees' in August *BBKA News*, that was correctly taken from the book *The Complete Handbook of Bee-Keeping* by Herbert Mace, but can you help with its accuracy as the quote refers to the melting point of sugar and the article is referring to the dissolving point of sugar in water. Sugar does not melt until about 146°C (Answers.com). Can you give some clarification on the point at which sugar dissolves in water and the point at which sugar melts?

In Response

Melting is a colloquial term for dissolving. It is widely used in the sugar industry to refer to dissolving sugar in process liquors and we have large tanks called 'melters'. What they really mean is dissolving sugar in liquids. Sugar does melt, but at a high temperature of 186°C. The most common application where

sugar melts is in the production of candyfloss. Sugar will dissolve at room temperature but most users dissolve it at higher temperatures to speed up the process. At room temperature sugar is soluble up to 67% i.e. if you take two kilograms of sugar it will dissolve in one litre of water. The hotter you get the water the more sugar will dissolve.

Regarding the candy recipe I am very surprised that the handbook advocates inverting sugar using cream of tartar. When sugar is inverted using acids (even weak ones like cream of tartar) you can start to break down the fructose bit of the sucrose to produce HMF. As every bee keeper knows HMF is something to be avoided.

Dr Julian M Cooper, Head of Food Science,
British Sugar plc

Washing Wax

I was a little perturbed by the last line of Chris Deaves' article 'Beekeeping Notes for Beginners' in August *BBKA News*. As was the plumber who was in my house that day.

Plumbers evidently spend much time in the unpleasant job of unblocking drains. One of the worst causes of these is 'FOG' — fats, oils and grease. I enquired if wax was akin to this disagreeable trio. He shuddered! 'Please ask the beekeepers not to let wax washings go down the sink' he begged.

Mary Paterson, Gloucestershire BKA

In Response

The 'washings' referred to here are the dilute solution of honey that is dissolved in the washing water. The beekeeper needs to make sure that no honey or nectar remains to attract bees or wasps after extraction is complete and to minimise the risk of any bee disease transmitted in honey.

The amount of wax dissolved in the washings (and therefore likely to accumulate in drains) is tiny, as wax is not soluble in cold water. All of the wax debris produced during extraction will have been captured on the uncapping tray or in the filters used on the honey before bottling. This will be retained by the beekeeper for recycling. I hope this corrects any confusion.

Chris Deaves, Chair Education and
Husbandry Committee

Survival of the Fittest

Pippa Barker raises some concern about long-abandoned hives mentioning that such 'hives may be a source of disease' (September *BBKA News*). I put forward an additional view point. Abandoned colonies that survive without any treatment or supplementary feeding may harbour something else instead — something beneficial. They may harbour genes, which enable them to survive in the local area. The process of survival of the fittest or, rather, survival of those best adapted to their environment, works best where there are colonies which are unmanaged. Adaptation will embrace a very broad range of characteristics — tolerance of varroa and suitability to the prevailing flora and weather, to name a few. It may be that the drones from these well-adapted colonies mate with local virgin queens — with benefit for the whole honey bee population in that area.

Janet Probyn, Wye Valley BKA

In Response

Janet raises a good point in that the natural ability of bees to evolve beneficial mutations to better resist pests and diseases is a possibility that we should not ignore. Many research projects around the world are following this kind of line of enquiry, especially as the honey bee genome is now well mapped. The BBKA has sponsored some research by Ron Hoskins and others in the UK in this area. However, there is a balance of benefit/risk in the suggestion Janet raises. To use an extreme human example, we did not eradicate smallpox by letting the disease carry on 'in the population' until the population became immune; the approach was to understand and immunise using solid science as a base.

There are many reported cases where feral bee colonies appear to survive for a significant time i.e. over one or more winters, and a UK research project is looking at these reports. However, what appears to be the same 'occupancy' of any unmanaged location is often occupations by successive colonies of bees, each of which dies out and is replaced by a totally different population. Often, this gives a chance for disease pathogens to accumulate.

On the broader point of general suitability of an evolved strain of bees for a specific environment, bee breeders strive to achieve this. Beekeepers should seek to be more selective in the queens from which they breed princesses; this would be to all our good. However, we are in a period of rapid climate change (for whatever reason); if this is a long term effect rather than a random fluctuation, then the environment for which we are selecting our bees needs careful consideration. Perhaps bees that do well in southern Europe at present are the ones we will need in the UK soon.

Chris Deaves, Chair of Education and Husbandry

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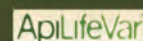
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