

BBKA News

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



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Spring Convention 2013



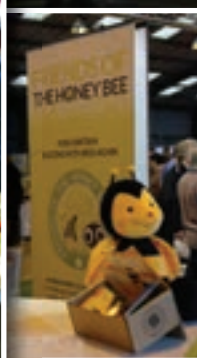
Extracting Honey

Your supers are capped and you are ready to harvest. Follow our step-by-step guide to process clear honey on page 11.

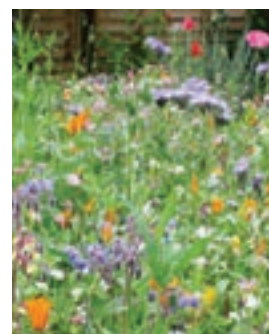


Neonicotinoids

Will the EU ban on three of these insecticides from December 2013 lead to healthier bees? Read our review on page 20.



Photos by Simon King.



Are There Enough Flowers to Support London's Bees?

An important question for all urban bees. Could we do more? Turn to page 28 and decide for yourself.





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Chairman's Letter



As most of you will know by now, the European Commission (EC) succeeded in achieving its aim to restrict the use of neonicotinoids in agriculture, horticulture and amateur uses. Like many things in life the devil will be in the detail and we await the details of the proposed actions and how the Member States will be implementing the restrictions.

We can only hope that the EC has fully evaluated the consequences of its actions and from the beekeeper's perspective; whatever course of action has to be taken, there must be no increased risk to honey bees.

The discerning beekeeper knows only too well that honey bee health is dependent on a number of factors, all interacting in complex ways. A key factor is the availability of forage for bees throughout the season. The BBKA recognised some time ago that habitat destruction affected forage supply which in turn impacted on honey bee health. So we began the process of finding opportunities to influence policy makers to rectify this; for example through the Common Agricultural Policy and through UK policies to encourage land managers and businesses of all kinds to do things to create more honey bee forage. These initiatives have taken time to develop and I can say that you will be hearing about some of these in the coming weeks.

By now the results of the BBKA Winter Survival Survey should be available and will hopefully have been made public by the time you read this letter. Thank you to all who completed and returned the survey form. There is much interest in the results and no doubt BBKA representatives will be invited to comment on them in the media. The BBKA has a good reputation with all forms of media and I would like on your behalf to thank all those who have given their time to work with the media in the cause of the honey bee. It is a team effort and like many things in beekeeping, whether national or local, a huge amount of help and support is willingly given by beekeepers (and their partners!).

The successful management of varroa continues to be a challenge and I do urge all beekeepers to regularly monitor their colonies and determine the risk to the colony and then treat them as required. Do not leave things to chance. The BBKA has raised the profile of varroa and is in discussions with interested parties on what needs to be done to provide practical help and solutions, for example optimising the effectiveness of current management techniques.

Lastly, I would like to mention in this month's letter the interactions which take place with other beekeeping associations and the increase in working together in the interests of the honey bee and beekeepers. These are very welcome and I hope they will continue.

David Aston, BBKA Chairman

Cover photos: Main images: Simon King; Top right: Andy Willis Middle: Dr David Aston; Bottom: Dr Karin Alton.

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In the Apiary

June should be a beautiful sunny month where our bees are building up well in time for the main summer flow. With luck we will have removed the spring harvest and will be hoping for a strong summer flow and maximum honey crop.

This year spring was late and many beekeepers have lost colonies. In most areas of the country the bees were slow to build up and swarming will have been delayed. But we must remain vigilant



Drone trapping on a drawn super frame placed next to the brood nest. All images courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; image supplied by the National Bee Unit at Fera.

because the colonies could still swarm in June, particularly if there is a strong nectar flow and the bees do not have enough room to store their nectar. Lack of room is one of the triggers for swarming.

In some parts of the country there may still be a 'June gap'. This is the time when the spring flow has finished but the summer

flowers have not yet opened. It can be a dangerous time if the spring honey has been removed and there is little nectar available. If the colony has built up well and has a young, vigorous queen then it will need a lot of food to feed the brood. If the weather is wet or if there is no forage then the colony can starve very quickly. If there are no supers on the colony then you can feed a light sugar syrup in a contact feeder.

June is also a time when we must remain vigilant about varroa. We should monitor the number of mites in our colonies four times per year, and one of these occasions is after the spring flow. We can then use Integrated Pest Management (IPM) to control their numbers. IPM is a variety of methods to keep the number of mites below the economic injury level, which, in the UK, is considered to be 1,000 mites. Of course mite numbers will vary because all colonies are different. Remember that in summer the mites can live for two to three months and complete three or four breeding cycles inside the capped brood cells. In this way the population will double every four weeks.

How best to measure varroa numbers

The first thing to do is to insert the varroa monitoring tray into the open mesh floor and leave it there for a week. Then count the number of dead mites on the tray and work out the average daily mite fall. If it is more than ten per day in June then the colony is in trouble.



Drone brood ready for removal.

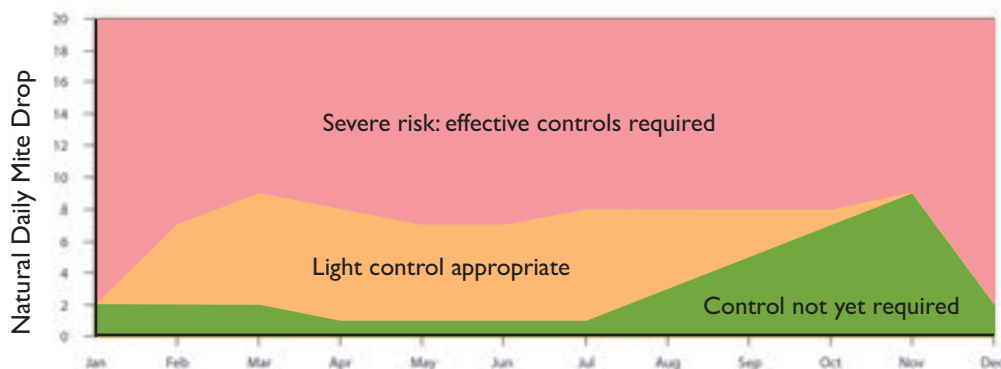
Strong colonies should have plenty of drones. Mites prefer drone brood because the cells are capped for longer thus giving the mites more time to breed. As part of IPM we can cull some of this drone brood

“ The 'June gap' is the time when the spring flow has finished but the summer flowers have not yet opened. If there is little nectar available a strong, well built up colony can starve very quickly and you may need to feed a light sugar syrup in a contact feeder. ”

and remove some of the mites. One of the ways to do this is to insert a super frame with drawn comb next to the brood nest. Normally the bees will draw drone comb underneath it. When the drone brood is capped and at the red-eyed stage remove it, uncap it and count the number of mites. If it is more than 5% to 10 % infested then the mite count is too high and action must be taken or the colony is likely to collapse before the end of the season.

Last year was a disaster for our bees in most parts of the country and this year has started badly. It is therefore most important that we do everything we can to maintain the health of our bees and to do this we must remember that the biggest threat to them is not the weather or the beekeeper. It is still the varroa mite.

Margaret Murdin,
Master Beekeeper,
Ormskirk and Croston BKA



Variation in natural daily varroa mite drop during a typical year.

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from a beginner's perspective

"Plant of the month" our recommendations
on bee friendly plants

"Around the colony" all the latest news of
beekeeping in the UK

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by Alan Potter of Brunel Microscopes

"Taking Bees to the Heather"
by Andrew Gibb

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Funny Honey: Honeydew

You take off supers after a long, hot summer and find combs of black, odd-tasting honey. You cannot sell it as flower honey, so what can you do with it?



Above: Aphid giving birth by MedievalRich at the English language Wikipedia. Left: Ant receives honeydew from Aphid by Dawidl at the English language Wikipedia. Both photos are licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license.



Honeydew honey is strange; almost everything about it is different from flower honey. Strictly speaking, it is not even of plant origin; at least not directly. Warm settled weather allows sap-sucking insects such as aphids and scale insects to multiply rapidly on suitable plants. Aphids (often called greenfly although they come in all colours) are poor fliers and are easily knocked off plants by wind and rain, so 'normal' weather keeps them in check naturally. When food is plentiful they do not even bother to mate and lay eggs: females can give birth to one or two small, but fully formed, females every day. In a few days these offspring will mature and do the same, so numbers can build quickly.

Aphids gather at the growing tips of plants where the 'skin' is thinnest and most easily pierced by their needle-like mouthparts. They are protected by hiding behind leaves or their camouflage colouring. The host plant's sap is their only food, but it is too high in sugars and too low in proteins for their needs. The excess sugars are disposed of by excreting them along with other wastes as a colourless, sticky liquid. To avoid gluing themselves together they flick away droplets of this honeydew from the ends of their abdomens, and these land on the leaves (or cars) below. These sticky droplets of honeydew are ideal breeding grounds for black sooty moulds, which darken the resultant honey. The colour can be olive green, brown with greenish tints or nearly black: it is influenced by the plant species, primary insect species, weather and environment. Kirk and Howes¹ suggest that the greenish tint found in some lime flower honeys '... may be due to traces of honeydew...'. The droplets also collect dust, which raises the mineral content and electrical conductivity of honeydew honey above the levels normal for flower honey.

Honeydew honey contains complex sugars that are absent or at low levels in flower honey. These could be produced by the host plant, in the digestive system of the primary insect, in that of the honey bee that collects it, during ripening, or any combination of these sources. Dadant² listed melezitose and erlose among others, and Hogervorst et al. describe these two as signature sugars for honeydew.³ It has less glucose and fructose, and a higher pH, ash percentage and nitrogen content than flower honey.⁴ Dipping a spoon into some honeydew honeys and lifting will pull out a long thread of honey, possibly due to the amount of 'gummy' substances they contain.

Many British plants' sap will be used to produce honeydew in a long enough spell of warm settled weather. Kirk and Howes⁵ describe the common lime as '...the worst offender among British trees...', also mentioning oak.⁶ In countries with warmer and more consistent climates, honeydew honey is regularly harvested and regarded as a delicacy more valuable than flower honey. In Germany's Black Forest, fir and spruce tree aphids produce the honeydew in Waldhönig (forest honey) or Tannenhönig (fir honey)⁷. On New Zealand's South Island, two species of Southern beech tree (*Notofagus*) are attacked by two species of sooty scale insect, resulting in New Zealand beech honeydew honey.⁸

Almost everything about honeydew is bizarre. Ants sometimes gather live aphids and move them to fresh plants to start new populations from which they gather honeydew for food. I have

watched one lane of ants running up the trunk of a pine tree in France and another beside it running down, presumably to tend, defend and milk a 'herd' of aphids above!

If your bees produce honeydew honey, you will know it by the dark colour of the comb when held up to the light, its different consistency and its strong flavour. The taste is definitely an acquired one: described variously as malty, woody,⁹ unctuous and metallic; it reminds me of a mixture of Syrup of Figs and Brasso! Any warm-weather honey can contain some honeydew, and this happens more often than most beekeepers realise.

What can you do with it?

Most British natives are not familiar with it and do not like it, but residents born in warmer countries may know and love it. Unless you are sure that it is fairly pure honeydew honey, you cannot label it as such under the Trades Description Act. You could sell it as honey and tell customers that there is some honeydew in it without specifying how much. You could sell it as bakers honey; its strong flavour would not come through when it is only a thin glaze on top of a sticky bun. Feeding it to your bees is another possibility. It is high in indigestible substances, which would not matter where bees have access to ad lib water and the weather allows cleansing flights. Crystallisation is slow to absent depending on its contents. But its high mineral content is mildly toxic to honey bees, and liable to shorten their life-span.¹⁰ So what would you do with it? Decide soon, in case global warming brings it to your apiary.

Peter Whyte, Master Beekeeper,
Member of Offaly BKA, Republic of Ireland

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Bees and Pollen: The Power of Flowers

Nectar and pollen are key attractants for pollinating insects. Nectar, ripened into honey, and pollen, trapped from foragers at hive entrances, are rewards beekeepers might gather for their bee colony stewardship.

Bees collect pollen as a protein source to raise their larvae (brood). Brood pheromone is the primary stimulus for the honey bee to leave the security of its home to visit flowers and collect pollen. Declining day length in the autumn may also be a stimulus to collect pollen. Flowering plants typically exhibit a daily or seasonal nectar-secretion and pollen-maturation rhythm. Bees have a sense of time and can adjust their foraging behaviour accordingly. Foragers will fly longer distances to collect attractive pollen compared to nectar foragers.

For plants, pollen is all about reproduction. Self-pollination is not common and although many plants have the ability to do both most flowering plants depend upon a pollinator to move the male germ cell, the pollen grain, from one flower to another. Some flowers produce self-fertile pollen but the vast majority seek a genetically different source of viable pollen. The honey bee, thanks to humans, is one of the most widely distributed generalist pollinators available to service plant reproduction by pollen transfer, although some would question this concept.

Pollen sources and availability

The pollen sources available to a bee in a given area depend on the type of environment and the length of the flowering period. What type of vegetation will grow in an area depends on soil texture, soil pH, soil drainage, daily maximum and minimum temperatures, precipitation, extreme minimum winter temperature and other factors.

Using scale hives, along with records of flowering times, we have come to realise that current seasonal flowering is quite different from as little as thirty years ago, due in large measure to climate warming and urbanization. In the eastern USA for example, records of weight gain from colonies maintained on scale hives, has revealed that the main nectar flow occurs nearly a month earlier than during the 1970s.

Beekeepers can observe which flowers the bees are visiting to collect pollen by observing returning foragers. Nectar collection is best from mid-morning to mid-afternoon while pollen availability is inversely related. Flowers do not continuously make pollen available.

Before pollen can be collected, the anthers must release mature pollen grains. There are usually many early morning pollen plants, then a lull near midday, followed by an increase later in the day. There are obvious exceptions to this rule. Flowering plants do not always follow the rules (or read the books) that biologists publish.

If we closely examine pollen loads, anywhere from 60% to over 90% of them will reveal that the bees have collected their pollen from a single source. When taken inside the hive, cells will be packed with pollens from several sources. This helps insure the bees nutritionally secure a protein 'smorgasbord'. Some pollens, although often touted as a perfect food for bees (and humans), just do not supply all the necessary amino acids bees require in their diet.

Pollen collection

At the flower bees actively collect pollen in a variety of ways; some pollens literally jump at the honey bee. During their flight from the hive bees lose negatively charged electrons, so when a forager arrives at a flower she has a slightly positive charge. The flower is negatively grounded by earth and because opposites attract pollen readily adheres to bee hairs.

Flowers come in many sizes and shapes, but this variety is no accident. Flowers have devised ingenious ways to position anthers such that as a bee pushes into the flower, she brushes along or against the anthers and picks up pollen on her body hairs. Some bees are not above cheating, learning how to extract nectar from alfalfa without tripping the pollen release mechanism or visiting the holes made by bumblebees in

blueberry; as few as 25% of flower visitors are there to collect pollen, the others are robbers or nectar collectors. For a UK survey of bumblebees robbing from red campion, *Silene dioica*, go to website <https://sites.google.com/site/nectarrobbing/>.

Pollen collection, however, is not merely via passive flower visitation. Bees may use their mandibles to dislodge pollen and can be seen actively moving about on the anthers of certain flowers to dislodge pollen and entrap it in their body hairs. Some flowers are specially designed to dust the visiting bee with pollen. Once such adaptation requires bees to grasp the hanging flower from below and vibrate the flower to release a pollen shower onto the body. Honey bees, alas, do not have the ability to do this behaviour, termed buzz pollination, but bumblebees can be seen buzzing appropriate flowering species.



Pollen forager on pussy willow. All photos by Dewey Caron.

Each of the estimated 250,000 flowering species presents a challenge to foraging bees, both honey bees and other native species. Individual bees may visit only one or at most a very few species of flowers in their short foraging lifespan of less than six weeks in the UK. Bees learn to become more efficient foragers with practice, perfecting how to get the flower rewards. Beekeepers, in turn, learn to perfect their bee stewardship to potentially increase harvests of honey and pollen from their bee colonies.

It is all in the aroma!

Bees recognise pollen as a food because of its odour. It is possible to extract such odours from pollen and watch the bees gather a worthless material such as cellulose. One attractant chemical that has been identified is octadeca-trans-2-cis-9-cis-12 trienoic acid, $C_{16}H_{30}O_2$. As beekeepers we know the attraction of pollen. By mixing as little as 5% pollen into an otherwise unrecognisable material (soya flour for example) we are able to supply artificial diets for our spring colonies before naturally occurring pollen becomes widely available. There is no evidence to suggest that bees are able to determine the nutritional value of different pollens and there is very little published data on protein levels of even the common plants.



Pollen forager on pear.

During any one season, the foragers of a bee colony may visit many different floral species. Two colonies hived under similar circumstances may collect different amounts of pollen or nectar from the same forage area. Such colony differences arise from chance discovery by scout

bees and conditioning to different pollens. This preference for different food sources can be exploited. The US Department of Agriculture (USDA) was able to breed two divergent lines of alfalfa-pollen-collecting bees in as few as three generations by initial separation of colonies that exhibited high and low pollen collection. After six generations, 86% of the foragers visited alfalfa from the high line versus 8% from the low line.

When bees collect pollen they mix the dry pollen grain with nectar and/or honey regurgitated from their honey stomach to moisten and help compact the pollen for transport in their pollen baskets. This mixing also helps to begin to change pollen into bee bread for the bees' consumption. Dry pollen, as a food source for bees, contains 16–30% protein, 1–10% fat, 1–7% starch, many vitamins, but little sugar.

Is pollen the perfect food?

It certainly is a necessary one for bees. The protein source needed for rearing one worker bee from larval to adult stage requires approximately 120 to 145 mg of pollen. An average bee colony in the UK will collect about 20 to 30 kg (44 to 66 pounds) of pollen



Scale hive; a hive set up on a scale for weighing a colony.

per year. That is a lot of pollen, but then the beehive has lots of hungry larval and newly emerged adult bee mouths to feed to meet daily and seasonal protein requirements.

Dewey M Caron,
Emeritus Professor, University of Delaware,
Adjunct Professor, Oregon State University, USA

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Flower Power

As readers may have noticed I write these articles weeks before publication so this year has been difficult because of the weather that is atypical for the season. Despite the lengthening days as I write in early April the fields are bare and there are very few forage plants. The reason for this unseasonable weather is a fairly well defined core of strong wind, 200–300 miles wide, occurring in the vicinity of the tropopause, a layer of the earth's atmosphere where wind speeds can reach 200 mph; this high-speed wind is called the Polar Jet Stream. In most years it passes north of the UK, but in 2013 it has been passing directly over us during the period that should have been spring, causing unsettled and cold weather. So I am writing about June in the hope that by the time you read this the Jet Stream will have returned to its northern route.



Above: *Phacelia*; right: *Limnanthes douglasii* (poached egg plant); below right: *Borago officinalis*. Photos by David Aston.

When the weather starts to improve with sun and some gentle rain many perennial plants will burst into growth. But will they catch up? In a normal June we would expect a profusion of both garden and wild flowers to provide pollen and nectar for developing brood and young bees.

It is hard to choose a few examples from the wealth of available plants especially if your goal is plants for bees. Perennial shrubs are generally good value and apart from mulching, trimming and taking cuttings they do not need much attention and will often flower over a long period; a good example is *Viburnum x bodnantense* which produces flowers from November to April. I have selected some of my favourites and I recommend you visit Open Gardens and garden centres in June and choose the ones you like for next year.

My first is *Nepeta* spp. perennial herbs loved by all bees, especially long-tongued bumblebees. Next are alliums, which provide nectar and flower from June to August; species of this family include onions, leeks and chives so do leave a few to flower. Field beans (grown as a farm crop) and broad beans, *Vicia faba*, are very important for all bees and if you live in an area where field beans are grown you will be likely to get a good crop of honey, despite the fact that honey bees with their relatively short tongues cannot reach the nectar and bite through the bottom of the flower to access it.

Flowering from June to September, bellflowers, *Campanula* spp., are excellent garden plants available in many sizes for all areas of the garden, but perhaps the most beautiful is the harebell, *Campanula rotundifolia*; its delicate flowers shimmer in the breeze of heaths and heather. A very different flower is the poached egg plant, *Limnanthes douglasii*, with its cheerful yellow and white livery. Bees jostle to get access to these nectar-rich flowers and their pollen. It is a low growing annual that spreads well and sets seed freely and if left it will grow new plants in the following year.

If you have the space and are keen to provide your bees with good home-grown forage you can make a small area for *Phacelia tanacetifolia*, a top nectar plant especially visited by honey bees and short-tongued bumblebees and useful as a good source of nectar that will continue to flower until the first frosts. It has an unusual flower; the stamens are longer than the petals so bees hover over the flowers to find a position from which they can collect nectar. Also it has interestingly dark blue pollen.

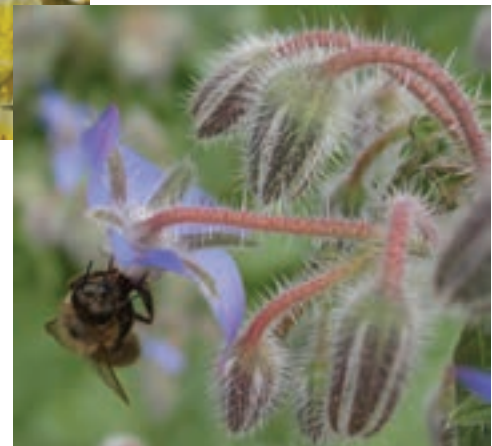
Another long-lasting and very important bee plant is borage, *Borago officinalis*, grown to produce an essential fatty acid called gamma-linolenic acid (GLA) for the pharmaceutical industry. It is used by all bees, and honey bees will work it for nectar by hanging under the flower and at the same time getting covered in its light grey pollen. Humans use the flowers to flavour summer Pimm's and

garnish salads. As with *Phacelia* it will seed and regrow for many years. Finally, lavender, *Lavandula angustifolia*; the scent of hot summer days. It grows best in the south of the UK and sheltered south facing sites further north, and I grow it in East Yorkshire. It is a major honey crop in



southern Europe and in Britain we are able to produce good crops most years. All types of bees visit lavender and their buzzing is a memorable sound.

If, after the cold winter, you find yourself with lots of plant losses or gaps in your planting plan, all is not lost. There are specialist companies that provide excellent seed mixes designed for bee, butterfly and bird gardens and mixes of annual and perennial plants for different habitats that can be sown from March to June. Good examples are www.suttons.co.uk, Flowerscapes, info@flowerscapes.org.uk and info@meadowinmygarden.co.uk as seen at the BBKA Spring Convention, and a selection of wildflower seeds is available in the BBKA webshop.



Sally Bucknall

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From Hive to Jar: Processing Clear Honey

When the honey crop is ripened it is capped by the bees to preserve it within the hive. Only remove supers when the comb is fully capped or when the open cells do not drip nectar when shaken lightly on their sides. You can test the honey in those open cells with a refractometer to check the water content if you are not sure. The water content needs to be 20% or less, preferably around 17–17.5% for long storage of top quality honeys.

I do not use Porter bee escapes but simply ‘bump’ the bees out of the supers into a roof by dropping the box an inch or two repeatedly, quickly. This has the advantage of being able to remove the honey crop in one visit and the honey comb is still warm from the hive, making extracting easier. It also has disadvantages, and frames occasionally break at the lugs. Having demonstrated this bumping on other people’s hives it also quickly shows up frames that have been assembled incorrectly with inadequate numbers of gimp pins or frame nails.

Once the bees are off the comb in the supers it is best to extract as soon as possible. This needs to be done in a bee-proof room or shed. I use an unheated uncapping tray which comes with a handy frame holder, which makes the whole job much easier and less messy (Figure 1).

The frames are removed from the super with burr and wild comb being cut off first before I uncap with a cold, sharp breadknife. I have a washing up bowl with clean, cold water and a towel to rinse and dry my hands when they get too sticky. After loading the extractor it is useful to have clean dry hands before turning the handle on the extractor.

I have found the most efficient way to uncap is to stand one lug of the frame on a wooden bar with recessed holds cut into it with the bottom bars towards me and the top bar pointing away, but there are a number of variations on this. Using a cold, sharp, dry, serrated knife, I use a sawing action to get the blade just under the cappings where there is normally a very small air gap. Starting at the bottom edge of the frame, I move the knife blade slowly up in a gentle sawing action through this air gap to the top side of the frame (Figure 2). The cappings should be loose and just fall away from the frame into the uncapping tray. If the cappings stick to the comb face, the back of the blade can be used to push the cappings

down the frame and off the comb into the uncapping tray. The blade can then be wiped free of honey by wiping it on the side of the uncapping tray or the wooden bar.

All cells need to be uncapped for the honey to be extracted. Once a super has been uncapped the frames can be loaded into the extractor. My stainless steel extractor comes with two cages so I can choose to have it arranged radially or tangentially.

There are pros and cons for each orientation. If the honey has started to set or granulate in the comb or there is an area of pollen then tangentially is probably your best option remembering to start slow and turn the frames twice, as the wire cage supports the comb better. The radial extractor requires a bit more effort in the spinning; it has the advantage of extracting evenly from both sides at once, but an unbalanced frame will explode easily making straining much more difficult.

In both cases warm, new comb is more fragile but the honey is more liquid and easily runs out. It is also important to load the extractor so that it is balanced (extra heavy or light frames are placed opposite one another). This helps stop the extractor from ‘waltzing’ about the extraction room. I use a piece of butyl rubber pond liner as a washable non-slip mat for the extractor to sit on. The rest of the floor has lots of newspaper put down to catch the drips and makes cleaning up much easier. It is very difficult to mop up honey.

The extracted honey requires straining. I use a stainless steel double strainer and simply run the honey through this from the honey gate or valve and into a bucket (Figure 3a and 3b). The only time I do not do this is if the honey has started to granulate as the sugar crystals block the strainer, in this case it is run straight in to the bulk bucket.

For show purposes or if I am unable to use the strainer because of the crystals, I warm the honey to liquefy it and then run it through a piece of clean, dry, butter muslin. This is held in place over the honey tank or jarring bucket with a piece of string, tied with a slip knot (Figure 4). Do not overheat the honey; 40°C is



Figure 1. Uncapping tray. Figure 2. Removing cappings from a frame.
Figure 3a and 3b. Running honey out of the extractor. All photos by Andy Willis.

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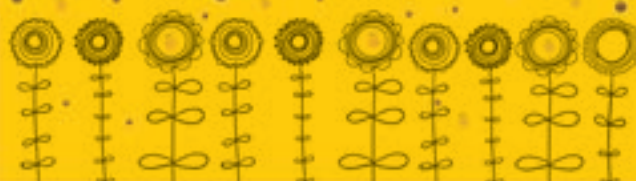
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Figure 4. Filtering honey through butter muslin.

sufficient to liquefy even the most set of honeys without melting the wax, which melts at 64°C. This finer filtering removes the tiny specks (propolis, wax, etc.) that spoil many a jar on the show bench and can cause unnecessary concern from the public as contaminants to our honey. Pollen grains within the honey will pass through both these straining processes.

Once strained the honey is best left for a few days or even a week (as long as it is not oil seed rape or ivy, which could set) to allow the air bubbles to rise to the surface. In the meantime wash the jars, if you have a dish washer, load it with just jars and wash/dry as normal. I do not have such a luxury but I do have two sinks and draining boards. Both are washed/scrubbed clean, with one sink filled with hot soapy water and the other filled with hot clean water. The jars are washed inside and out and then rinsed in the clean water and left to drain upside down on the draining board (Figure 5). They are then placed still upside down on the wire racks in the main oven at a low heat to air dry. Do not use a tea towel to dry them as this is not hygienic and may introduce fluff to the jars. The warm dry jars are then placed back into the box they came from but still upside down so no contaminants can fall into them while in the box. These are now ready to be filled with honey.

By now the honey will have formed a thin cap of froth/bubbles on the surface. I use a soup ladle and skim this top layer off into a jar or two (Figure 6), this goes into my own cupboard for my own use. There is nothing wrong with it, but it does not look good in the jar and we are producing a premium product.

A few empty jars are then weighed to find the heaviest weight and to this weight you add 454g for 1 lb jars or 227g for ½ lb jars, etc. to get the minimum weight when filling. At this point I then take the water content of the honey using a refractometer and record this in a record book along with the apiary, the number of supers and probable source, also the dates spun and jarred, container type and total weight (once you have completed jarring). This batch is then issued a unique batch number (usually year of production followed by a sequential number for each batch i.e. 2013/01 and then 2013/02 and so on).

The jarring bucket is then lifted onto a clean work surface with some masking tape put

along the front edge of the work top to stop the bucket slipping into your lap when you tilt it towards the end of jarring.

The valve thumbscrews are loosened slightly and a jar held at an angle underneath (like pouring a pint in a bar) the valve is opened and the honey run slowly down the far side of the jar, trying not to get any air bubbles caught in the flowing honey until the jar is almost full (Figure 7). The jar is then levelled off and slowly filled up to the neck, before the valve is shut off. A fine thread of honey will continue to flow and you need to wait until this stops before



Figure 5. Jars draining after being washed and rinsed.

removing the jar and replacing it with another. This is a 'sit down' job and if you have the help of another person to check the weight of the filled jars and add or remove a teaspoonful of honey to about 5g over the minimum weight (you have already decided upon) before new, clean lids are put on, then this makes a smooth production line with minimum of fuss and bother (Figure 8). These full jars then go onto a level storage shelf until sale day with the batch number and water content prominently displayed. This is so that I know which honey is to be sold first, the best quality honeys with the lowest water content are kept the longest and honeys with the higher water content sold more quickly.

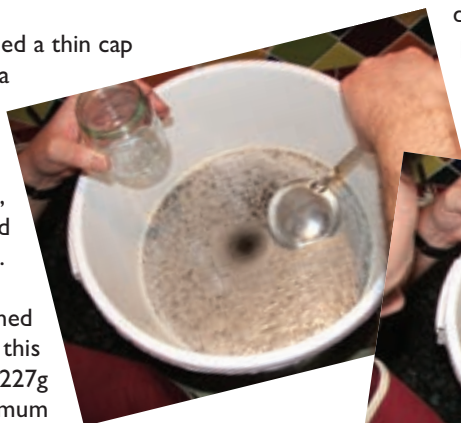
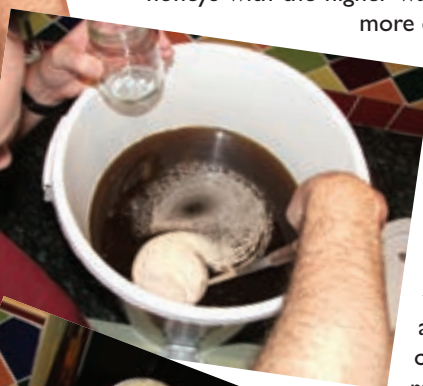


Figure 6. Skimming froth from the jarring bucket.



The anti-tamper and jar labels are only put on once the honey is about to go for sale. In a record book the lot number and batch number of each jar is recorded. In that way you are able to have traceability for every jar you sell, those you give away and those you take anywhere. It also means that if the honey should start to set you can re-warm it in the jar quite quickly, rather than having to liquefy a bulk bucket, which can take some time, without causing deterioration to the honey or label.



Figure 7. Filling a jar.

When the jarring bucket is getting low, I have found it helpful to stand the far side on an old copy of the telephone directory or similar. This keeps the bucket tipped towards you enabling you to jar nearly all the honey without scrapping, using a spatula to help only the last dregs at the bottom of the bucket, the masking tape helps stop slippage.

A surprising amount of honey drains from the cappings into the catch tray. I usually run the knife through the larger pieces of



Figure 8. Jars to be checked, weighed and lidded.

cappings to help them drain. The drained wax cappings are then bagged up into freezer bags and placed in the freezer for 24 hours and then can be stored in the dark for later wax recovery and processing. The honey that has been collected can be either treated as a separate batch of honey or added to the bulk before warming and filtering.

Andy Willis,
New Forest and District BKA

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Honey Beer

Tatton Brewery's beer, Lazy Haze, won the Honey Beer award at the 2012 National Honey Show. Head Brewer, Gregg Sawyer, offers an insight to how the beer was made, as well as offering food for thought to anyone thinking of entering a honey beer into this year's National Honey Show.

Lazy Haze was the result of a project suggested by our brewer Lee, with key ingredients honey and tea, and there is a poem there somewhere. Our objectives were to develop a beer with:

- ❑ A drier taste than most commercial examples, not a sweet beer.
- ❑ A distinctive aromatic quality.
- ❑ A detectable honey character.
- ❑ Low alcohol content, as a light summer ale.
- ❑ No post-fermentation flavouring.
- ❑ Local ingredients.

The 'local ingredients' requirement was our biggest challenge. We needed about 25 litres per brew, and most local producers do not harvest enough honey to be able to sell this volume to us at an affordable price. However, we did not want to settle for bland anonymous honey from unknown sources, cheap though it may be. Eventually Eli Leconte, chef patron of L'Endroit in Congleton offered us his surplus. His apiary provides honey for the restaurant kitchen, and we had found an ideal source.

Tea is an unusual addition, but having messed about with it back in the days of home brewing we were happy to take on the challenge. We have a formal recipe development process, but as our first honey brew, and with the unusual tea ingredient, we had to apply a bit more art along with the science. For this critical ingredient, we were very fortunate to know local tea blenders QuinTEAssential. Bernadine worked diligently to produce a bespoke blend to meet our particular requirements, and the result is a perfectly-balanced aromatic contribution to the beer.

Honey as a brewing ingredient needs to be treated with care; it contains a high proportion of monosaccharides, or simple sugars, giving it approximately 95% fermentability, but also has some undesirable ingredients; more about those later. The local Cheshire honey we use is lightly flavoured, and so we need to ensure that we retain as much of the honey flavour as possible. For a proper honey beer, the honey is fermented with the rest of the wort, and we add the bulk of the honey to the kettle just after boil; this sterilises it while avoiding excessive loss of aromatics.

There is also loss of aromatics during the vigorous primary fermentation, due to the heat of fermentation and evolution of carbon dioxide. To compensate for these losses, we cask-condition the beer after primary fermentation with the addition of a little more honey to boost aroma, without making the beer too sweet and unbalanced. This late addition also contributes to Lazy Haze's lively condition.

With fresh, unprocessed honey it is necessary to kill off any wild yeast or bacteria that may spoil the beer. For the cask-conditioning of honey, we use a relatively gentle heat treatment in place of the brew kettle to minimise aroma loss. We find 72°C for thirty minutes is sufficient.

Lee's recipe has produced a delightful beer with a distinctive aroma and subtle honey character. The only problem we have is waiting for these indolent Cheshire bees to start producing honey again after their winter holiday, 'busy as a bee' is only seasonally applicable.

Gregg Sawyer's tips for home brewers

- ❑ Remember that honey is extremely fermentable; you can expect about 95% of any honey you add to turn to alcohol, which will affect the strength of the beer
- ❑ As with anything you add to beer, you need to be careful of contamination. Honey contains all sorts of interesting little things that can affect the beer. If you are adding the honey during the boil, that that will be enough to sterilise it, but if you are adding honey afterwards, you need to pasteurise it by heating it to 60°C to 70°C and letting it stand for 15 to 20 minutes.



*Lazy Haze beer photo by
Greg Sawyer; pint glass
photo by Jongleur100
courtesy of Wikimedia
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Acknowledgement

We were very sad to hear of the death of our honey supplier, Eli Leconte of L'Endroit in Congleton, earlier this year. I would like to take this opportunity to recognise his generosity in making his excellent local honey available to us.

Greg Sawyer,
Tatton Brewery

Visit the National Honey Show 2013
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Everyone Has to Start Somewhere:

Part 4 — The Sting

One aspect of beekeeping about which the beginner will soon obtain first-hand experience is the sting that the worker bee can inflict. The first time I was stung, I received quite a shock because it was more painful than I expected. However, as time goes on and one receives further stings so the pain seems to diminish, or one's threshold increases, depending of course on where the sting is located. It seems that the body extremities seem to register more pain; the tip of a finger is more painful than the hand, so it is probably connected to where there are nerve endings.

We had learnt on our course that the sting will not be dangerous to the majority of people. Nevertheless, it is still with some trepidation that the first few times one handles bees one is waiting to see what it will feel like and how one will react. I did not have to wait long before I was stung on a finger when clumsily handling a frame. Despite being acutely aware that I had been stung at the time, within minutes, I could not feel it and forgot about it until the next day when the area around the sting began to itch.

Take time to zip up

I soon found out that there are lessons which should be learnt about stings, which one does not find written about in detail in any text book. I was attending a tuition course at the beginning of my second year, and I was wearing a protective suit which was a different design to the one I had worn previously. It was a full suit which had to be zipped up the front with two lateral zips attaching the veil which joined from either side to meet in the middle; a very simple design and normally very effective. However, on the first day that I wore the suit, I was far too relaxed about making sure all of the zips met and there were no gaps. Bees seem to delight in finding small holes through which they can crawl. I have heard of

someone who was wearing only a protective jacket and who had not properly done up the zip on the front of his jeans. He, like me, never made the mistake again.

As I examined some frames in the afternoon, I became aware that there were a couple of bees flying rather closer to my face than was normal, and they were buzzing crossly; they were inside my veil. Unfortunately as a bee suit is designed to keep bees out, if it fails in that task for whatever reason (in this case user error), it is also extremely effective at keeping them in. Before removing



*The 'offending' item: a bee sting that has been removed from its point of impact.
Photo by Sue Carter.*



Make sure your suit is 'bee-safe' when in the apiary. Photo by David Wootton.

my veil, I hurried away from the hives which I had been looking at, but it was too late. One well aimed dart struck me in the neck before I was able to remove the bees from the suit. However, I was so pleased that I had received only one sting that I did not bother to concentrate on actually removing the sting. This was my second mistake; the worker bee sting has a number of very small barbs on it, which retain the sting within one's skin, tearing it from the bee in the process. The sting will continue to pulsate, even after it is torn from the bee, pumping venom into the flesh for up to eight minutes. Therefore, the longer you leave a sting in the skin, the more poison will be injected and possibly the more acute the reaction.

In one respect I was lucky. I later saw exactly the same thing happen to a colleague, Pete, who was on the same course. Pete was, unfortunately for him, more dextrous in removing his veil quickly and was stung in the process. Other bees were immediately alerted to the fact that there was some danger in the vicinity. I do not know whether it is smell, noise or some other signal which alerts them, but a large number of bees pursued him, intent on inflicting maximum damage. If there is a smoker immediately to hand and one puffs large amount of smoke about one's face, it will mitigate to a certain extent the fierceness of the attack. Pete was

'smoked' but still suffered a number of stings to his head and neck. We had all learnt by then that the quicker one removes the sting the less impact it will have on the person.

In my case, I failed to remove the sting for about fifteen minutes and then only because some considerate person realised that I was unaware that this was a recommended course of action. Although I felt fine, apart from a slight swelling under the chin, when I was sitting drinking a cup of tea and eating one of the inevitable cakes which always seem to materialise whenever a group of beekeepers get together, I began to feel very itchy under the arms. Despite the fact that I do not often itch in unusual places, I thought nothing of it until I got home and had a look in a mirror. I had large red rashes under my arms and in my groin area; obviously the sting had been in the vicinity of my glands and produced some significant effects on other parts of the body. Because I did not feel unwell, apart from an uncomfortable and unsightly swelling on the neck (in fact I seemed to have aged thirty years and my neck and chin seemed to have merged into one) I did not deem it necessary to do anything more about the sting. I did decide, however, that it was time to do further research on what one should do after being stung.

What to do if you are stung

My 'house rules' are now based on experience. No beginner will go out looking to be stung, but accept that you will be stung, that it does hurt a little, but only for a short time, and do not be frightened by the inevitable. The best course of action is to:

- ❑ Remain calm.
- ❑ Puff smoke onto the area where you were stung.
- ❑ Remove yourself from the hive for a short while. If you were stung inside your suit for whatever reason, move well away from the hive before removing your veil. It is much better to be stung once or twice by bees that have got inside your suit than by a larger number who were not in it but are certainly going to join in the action given a chance.
- ❑ Scrape off the sting as quickly as possible; the more quickly you can do it (without exposing yourself to more bees) the less venom you will absorb and therefore the less the swelling and the quicker the recovery. Do not try and pull out the sting, as you are likely to squeeze the venom sack and 'inject' all of the venom into you. By scraping the sting with a fingernail or hive tool you are able to remove it without increasing the dosage you absorb.
- ❑ I now carry antihistamine tablets with me; these might not suit everyone, but if you happen to suffer from hay fever and take them anyway, they will probably be useful to help control any swelling.

Some people do react very badly to bee stings. Generally beginners will be stung when on a course, and when there are experienced people around to gauge the reaction. Inevitably the reaction will be more intense when certain parts of the body (principally around the throat, head or eyes) are stung. But it is normal to have a reaction and for the area which has been stung to be swollen and itch for several days. However, a few people suffer symptoms of anaphylaxis, which is a serious allergic reaction. Extreme cases cause swelling of the lips, tongue and throat. If the person who has been stung feels unwell or has difficulty in breathing, it is always better to err on the side of caution and promptly seek medical advice. Doctors can quickly deal with the cause of the discomfort, but timing is critical; do not wait longer

than necessary. And for the rest of us, one can be consoled by the fact that the average person can be stung by about 2,000 bees at once before the venom dosage is likely to be fatal.

“ There are small barbs on a sting, which retain it within the skin. It can continue to pump venom into the flesh for up to eight minutes. Therefore, the longer you leave a sting in the skin, the more poison will be injected and possibly the more acute the reaction. ”

There are a number of tips on how to avoid being stung, but mostly it is common sense and avoiding keeping aggressive bees. Prompt remedial action once you are stung can make a significant difference to the extent of the discomfort later. I was alerted one afternoon at home to the fact that there was trouble brewing. I heard terrible expletives coming from the vegetable garden where my wife was and imagined that one of our dogs had been caught digging up vegetables. I hurried over to find my wife holding her lip and swearing most terribly. I knew that things were dire when she started referring to me and 'my bees'. Everything in our household is always hers or ours; when something is solely mine there is always a very good reason. And to make matters worse, we were going to a black tie dinner in the evening and the sting was apparently on her lip. A quick scrape, some force-fed piriton and an ice pack (although I have no idea if that really did help) to my mind saved the day; despite her protestations of impending deformity and unsightliness, my wife had only the tiniest swelling when we went out that night and no one would have been aware of it if they had not been regaled by stories of my bees and their (and my) impending ASBO.

Julian Grazebrook,
Dorset BKA

Bee Stings: A Medical Doctor's View

Dr Richard Bache was asked for his comments on bee stings and he has added a few useful points to Julian's article, which we would like to share with readers.

The red rash that is described in Julian's article sounds like urticaria. Urticaria is a common allergic reaction and, in itself, is not dangerous, but intensely itchy and usually easily treated with antihistamines.

I would point out that there is relatively little evidence that scraping of stings out is any better than simply pinching them out. One of the few studies that have looked at the issue of the removal of bee stings could not find any difference in the effects following different removal methods, but found that prompt removal was important when removing stings. I therefore think that prompt removal is more important than the mode of removal and I would not want anyone to waste any time in trying to find a suitable 'scraper' rather than just removing the sting.

Hayfever is an allergic reaction and its presence would make someone more likely to develop an allergic reaction to bee stings (a tendency usually referred to as Atopy).

The urticarial reaction described here is more of a nuisance than anything, but would mark someone out as being at higher risk of anaphylaxis.

Dr Richard Bache, Somerset BKA

Springtime Conventions

As beekeepers we are among the most traditional, dogmatic, superstitious, habitual (delete those not applicable) people on the face of the earth. We all have our own conventions and many of them relate to spring and the first inspection of our colonies, but this year has been a very difficult one for maintaining those traditions. I remember an established and well-respected beekeeper telling me thirty or so years back that he would never open a colony for inspection before May for danger of chilling the colony. Personally, I have never followed that maxim as, in some years, colonies are swarming by the middle of April, but this year maybe he was right! One convention which I have tended to follow is that the right time to do the first colony inspection is when the flowering currant is in full flower and you can stand in the apiary in shirt sleeves for more than ten minutes without being cold. Now, in my part of the world this can sometimes be in mid to late February and is nearly always possible in March. This year, however, I can honestly say that the first day that really met these criteria was 19 April — and even then there was a chill wind blowing.

We did manage to do a quick inspection of all of our colonies the weekend before the BBKA Spring Convention but the inspections did not take very long as there was very little brood to see. What was clear was that there was sealed brood but absolutely no eggs or larvae to be seen anywhere; obviously the queen had made some effort two or three weeks earlier but the weather, or perhaps the poor nectar and pollen availability, had caused her to stop laying eggs more recently. Bees are very resilient but I could not help thinking just how old all of the bees in the colony must now be. Because of last year's weather conditions, the winter bees had been produced a little earlier than usual and here, this spring, the new year's bees were being produced rather later than normal. I think that there will be many colonies which will have failed purely and simply because the bees were just too old and worn out this spring.

One of the spring conventions that had seemed to become the norm in recent years was that colonies often swarmed when the beekeeper was away visiting The BBKA Spring Convention. Some beekeepers I have met had even stopped going to the convention so that they could deal with their swarms! But this year that was most certainly not going to happen and so the devotees flocked to Harper Adams University without any fears of missing swarms. And what a show it was. It has just grown and grown such that it can claim not only to be the premier beekeeping event in Europe but also the premier beekeeping education event in the country. I managed to count 39 workshops ranging from 'Anatomy and dissection microscopy' to 'Honey cookery for busy

people' and from 'Gardening for beekeepers' to 'Preparation for general husbandry, module 1 and module 5'.

Many of the courses were apparently fully booked some weeks in advance, though this causes some discontent among those who leave making decisions until the last minute. The level of demand certainly justifies the range of courses — it is difficult to believe that the Sunday workshops on the Education Day have only been running for around six years. Students come back for workshops year after year because of the quality of the workshops and the tutoring they receive. Because of adverse weather, the decision was made not to have bees on site this year and this meant that the Queen Rearing and Preparation for General Husbandry course was entirely classroom based. While only in its second year in its present form, the comments from students clearly show that it is meeting its objectives. Not only do the students like the course but its success has encouraged the BBKA to emulate this training through their Education and Husbandry Committee.

Once again the lecture programme also seemed to be popular with a wide variation of topics and lecture styles on offer; several lectures benefitted from the new arrangements where the lecture was broadcast live to an adjacent room. I took advantage of this facility and noted that many people seemed to feel more relaxed watching a broadcast than a live event!



This honey bee is making up for lost time collecting both pollen and nectar from the flowering currant. Photo by The Forager.

Another convention is that beekeepers take vast quantities of equipment, gadgets and supplies away with them and this year was no exception which proves, once again, what optimists beekeepers are. The trade hall, drier, warmer and altogether more welcoming than last year, seemed to have a very large number of feed suppliers exhibiting this year. Is that a reflection of the prolonged winter we experienced or are beekeepers really becoming more prepared to spend money and are buying ready-made fondant for their bees? I am sure that the trade would have liked to have sold more but it seemed to me that, given the weather and the development of bee colonies up to the time of the convention, the level of business was pretty good.

I spent a lot of time listening to beekeepers at the event and it seems to me that the general consensus was that it was an excellent show all round. Most of the comments I heard suggested that beekeepers wanted more workshops, a two-day trade show and better weather so I will pass those comments on to Tim Lovett to see if he can get the sun to shine next year.

The Forager

What's In It For Me?

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Throughout the year benefits will be added to the BBKA Members Area. Log in for more information on the offers described below and other offers at: www.bbka.org.uk/members

In addition to the obvious standard benefits such as the much valued Third party public liability and product insurance, online resources within the Members' Area at www.bbka.org.uk as well as the support and information that your membership provides; we are pleased to announce new membership benefits. These have been negotiated for you to enjoy as a registered member of the BBKA to help you save money and have fun. These include the following:



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National Bee Supplies (NBS), has announced a very special offer to all BBKA members who can now enjoy a 5% discount off all of their 2013 Catalogue prices. When ordering, either online at www.beekeeping.co.uk or by telephone on 01837 54084, the code BBKA-NBS should be quoted to receive the discount.

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River Cottage has given millions of TV viewers a taste for great cooking since 1998, when chef, writer and 'real food' campaigner, Hugh Fearnley-Whittingstall first brought his famous food ethos to Channel 4. His hard-hitting campaigns have changed the eating habits of a nation and improved the welfare and sustainability of animals and fish.

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We thank our continued membership benefit providers.

Neonicotinoids: Europe Decides

Introduction

The European Commission (EC) has announced that it will adopt a proposal to restrict the use of three neonicotinoids: clothianidin, imidacloprid and thiamethoxam for a period of two years with effect from 1 December 2013. This announcement came after the second vote on this proposal on 29 April when a majority of EU countries voted in favour.¹ During the two-year suspension, the Commission will review the conditions of approval for these neonicotinoids.

The proposal restricts the use of the neonicotinoids for seed treatment, soil application (granules) and foliar treatment (spray) on bee attractive plants and cereals. Their use by non-professionals, e.g. private gardeners, is completely banned. However, neonicotinoid treatments will still be allowed for treating crops not attractive to bees such as winter cereals, in greenhouses and for seed production. The purpose of this article is to summarise reactions to the Commission decision and to offer a brief comment on the environmental impact of alternative insecticides.

Reaction to the European Commission suspension

The European Beekeeping Coordination, Buglife, The Soil Association, The Wildlife Trusts, Bumblebee Conservation Trust and RSPB all welcomed the suspension, reflecting wider environmental and conservation concerns. There were some reservations expressed regarding the limited time period and the absence of a total ban. There were calls to establish a monitoring programme to see how all pollinators respond to the ban, more field testing and promotion of safer alternatives to neonicotinoids.

The manufacturers Bayer CropScience and Syngenta, and the Crop Protection Association, doubted the wisdom of the EC decision, calling it a set-back for technology, innovation and sustainability, which would not have a positive impact on bee health. They warned of reduced crop yields, reduced food quality and loss of competitiveness for European agriculture. They claimed the EC decision was based on poor science, including an over-estimation of the amount of pesticide bees are exposed to in the field.

Reaction from scientists

Dr Raine from Royal Holloway University said the weight of peer-reviewed scientific evidence suggest field relevant exposure to neonicotinoids can have adverse effects on bees. Whether a moratorium would benefit bees will depend on alternate methods of pest control. There will be a need to monitor bee populations during the two-year moratorium and check the soil residue levels. The risk assessment needs to take into account combinational exposure as well as sub-lethal and chronic effects. Professor Goulson from Sussex University said there was no evidence that withdrawal would have significant negative impacts on farming. There is a need to return to Integrated Pest Management (IPM). He stated that the continued use of neonicotinoids on cereal crops during the moratorium was a recipe for environmental damage and the evolution of resistance in pests.

Dr Osborne from Exeter University said that during the moratorium the review of the pesticide regulatory process must be completed to ensure it is fit for purpose to assess the safety of systemic pesticides. A monitoring scheme of wild and managed bees must be set in place to provide evidence as to whether the moratorium is correlated with changes in bee numbers and colony

mortality. Norman Carreck from Sussex University said that it would be difficult to demonstrate any benefits to bees in just two years. There needs to be an Environmental Impact Assessment on the alternative pest control measures in place of neonicotinoids. Little is known about the sub-lethal effects of any compounds because the pesticide approval process has not focused on this aspect.

Dr Dicks from Cambridge University said the ban was a victory for the precautionary principle which is supposed to underlie environmental regulation. Neonicotinoids are one of the many interacting threats to pollinators. Professor Linda Field from Rothamsted Research said there are many factors known to affect bee colonies, such as varroa, viruses, etc., all of which need to be taken into consideration. Banning neonicotinoids will reduce pest control options, so she was not in favour of an immediate ban.²

Comment on alternative insecticides

In an article *Ban on pesticides to save bees may really do them more harm*, it was claimed that the ban would force farmers to use older chemicals such as synthetic pyrethroids and carbamates and as a result, there is no guarantee that bees and other non-target insects will be better off.³

There does not appear to be any study comparing the environmental impacts of neonicotinoids with these older chemicals. Also the many variables, such as acute and chronic toxicity, time of exposure, persistence and accumulation in soil and water, etc., and the different methods of application, i.e. systemic (seed treatment) vs. foliar (spray) and routes of exposure to bees, make it impossible to draw environmental conclusions.

The Environmental Audit Committee (EAC) was equally unconvinced by this environmental argument. The EU Directive on the Sustainable Use of Pesticides requires National Action Plans (NAP) to encourage the development and introduction of IPM. This is a broad approach to plant protection that keeps the use of pesticides to levels that are economically and ecologically justified. The EAC concluded that if the IPM is to be implemented effectively in the UK, Defra should inform and incentivise farmers to make choices other than "the old way of doing things."⁴

In the article it was also suggested that European governments did not fully understand the risk of suspending neonicotinoids. However, it is unlikely that the Commission and Germany, France, Spain and Poland, for example, would have not considered the implications of withdrawal of neonicotinoids. Indeed France, Germany and Italy have, or have had suspensions of neonicotinoids on specific crops. Perhaps there are lessons the UK could learn about their experience of doing without neonicotinoids.

John Hoar, Fareham and District BKA

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1. European Commission. *Bees & Pesticides: Commission to proceed with plan to better protect bees*. 29 April 2013.
2. Science Media Centre. *Expert reaction to EU vote on neonicotinoids*. 29 April 2013.
3. The Times. *Ban on pesticides to save bees may actually harm them more*. 6 May 2013.
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Spring Convention 2013

I was asked to write an account of the convention because I am a relative newcomer to BBKA and the Convention, but I cannot claim to be the usual convention newbie. I was Secretary of BDI for five years in the early 2000s and had to attend BBKA conventions which were all at the Royal Showground at Stoneleigh. My one lasting memory is of the overcrowding. On one occasion as people spilled into the BDI stand area, I was looking at the emergency exit and wondering whether I would be able to reach it! A truly frightening experience and one that has remained with me.

Putting down my role with BDI, I subsequently joined BBKA and it was with relief and delight that I saw that last year the convention was coming to Harper Adams University. The reason for the relief is plain from the above.

be coupled with people who have retired early, or are using redundancy payments and are getting into beekeeping. We need to gain experience and knowledge quickly. Now knowledge can be gained quickly and effectively, especially by attending the lectures and from association meetings. The experience, essential to use the knowledge, cannot be so quickly absorbed and applied.

What was particularly noted and commented on in chats with friends was that there were lots of new suppliers, often with very specialised or niche kit. We could not help but wonder how many have really



The delight was because living in Mid-Wales the venue is close to home. Last year I travelled to the convention on Saturday and Sunday. This year I decided to stay at the college on the Saturday — good call! So, with a clear personal bias in favour of Harper Adams, here is my idiosyncratic account of my 2013 Convention.

As last year I had to deliver some items to the Bees Abroad stand. Last year I had to explain to helpful stewards that I needed to get these in so that Bees Abroad would have the items to sell and I did not want to join a very long queue to get in. This year I did not have so much to deliver so I turned up just after 9 o'clock and found a queue of just a couple of minutes at most. This short queue may be down to the success of the outside pre-order system. On the other hand, after talking to some traders, I wondered whether there are signs that the state of the economy is causing beekeepers to think twice, or three times, before making a purchase. As an aside, and based on a few observations, I think it is disappointing that some seemed to pitch up, collect orders, fill the car and depart as quickly as they came. What a lot is missed by not dallying for the day. For me the lectures, demonstrations and the chat with friends and former colleagues make for a fine weekend.

Looking at those at the convention it seemed that there are lots of newly retired people coming into beekeeping. The 1946–1948 birth bulge has much to answer! This surge seems to



The Spring Convention. All photos by Simon King.

researched what is likely to be a very small market. A similar observation about knowledge and experience might also be applied to some of these new kit suppliers. We wondered whether they have the necessary wide experience of the way beekeepers actually work within the confines of their apiaries. It is perhaps not sufficient to assume that what one beekeeper regards as an issue to be resolved is widely shared. Sometimes the kit seemed designed to solve a problem that does not really impact on (my) routine

beekeeping. It seems to be a courageous assumption that a business can be built on a single product idea. All that said, good luck to such enterprising people who are bringing fresh ideas to our craft. Who knows, we may have seen the first steps of an enterprise which will one day rival the current 'big boys' of our beekeeping world. In a similar vein we can only be optimistic for bees and beekeeping when we see and hear from the increasing number of PhD researchers working with bees and describing the results of their work. Such a change from the time when I recall BDI struggling to find a researcher who was interested in bee disease research to sponsor. All the attention to bees and pollinator issues in the media, even if some of the stories and claims may be a little simplistic, can only be of benefit if the interest in bees and beekeeping is spread more widely and more people of all ages are attracted to our craft.

I had planned to get to three lectures on the Saturday but only made two because I was engaged in a somewhat animated beekeeping discussion and when I looked up at the clock, realised that I had no chance of being allowed in as I was already five minutes late. A good policy and only fair to those who turn up on time and for the lecturer who does not have to recap for the latecomer and irritate the rest of the audience. (Note to self: keep an eye on the time next year!) I greatly enjoyed the two lectures I did attend — Gardening for Bees and Harnessing the Swarming Impulse. I am already re-designing my garden ... more work for the wicked ... and I really must not let any swarms get away in 2013 after the last winter's devastation.

The big advantage of staying over is the Saturday evening meal. No need to worry if you find yourself on a table where you start off not knowing anyone. By the end of the evening you will have made at least eight more new friends. But if you want to have a

good crack at the quiz you may need to carefully select your table by ensuring that there are some particularly well-qualified beekeepers and a former Master-Mind champion already seated. Do as I say and not as I did; still we enjoyed ourselves and it did not matter that we found ourselves in the colony that needed to be united with a stronger one. Sunday morning was back to earth time with a study on the syllabus of Module 5. Looks like I am going about this the wrong way but I reckon if I can get some microscopy under my belt and get on with Module 1 studies and then get Module 5 covered I might be able to really get down to developing some knowledge about bees and beekeeping. Then it is a matter of getting a few years experience and making sure that after another ten years I have not just repeated one years' experience ten times.

So now what's for next year? First, I will try to get to the Friday microscopy course; this year's plans were knocked off-course as I unexpectedly had to be in Cardiff on the Friday. Better planning needed next year. Next, I promise to keep a better eye on the clock so I do not miss any lectures that I have carefully planned to attend. Finally, I shall check the various quiz programmes for beekeeping contestants who are coming to the Saturday dinner — not that I am ambitious about the quiz you understand — it is the taking part that matters! And that is really the point; it is the taking part at the convention that matters. If you have not been before, give it a go. If you have only been to Stoneleigh, come to Harper Adams University. You will be amazed and relieved if, like me, you can only recall great overcrowding at Stoneleigh. If you are already a convention devotee you probably have not got this far ... but, if you have I imagine you are already looking forward to the 2014 BBKA Spring Convention on 4,5 and 6 April 2014.

Roy Norris, Montgomeryshire Beekeepers

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How Bees Make Wax and Build Comb: Part I

Introduction

The production of beeswax is essential to the survival of honey bees, for it is from this complex substance that comb is built. Wax cells make up the basic unit for the storage of honey and pollen as well as for the production of brood. Beeswax is a mixture of between 300 and 400 individual compounds. The major components of comb wax are:

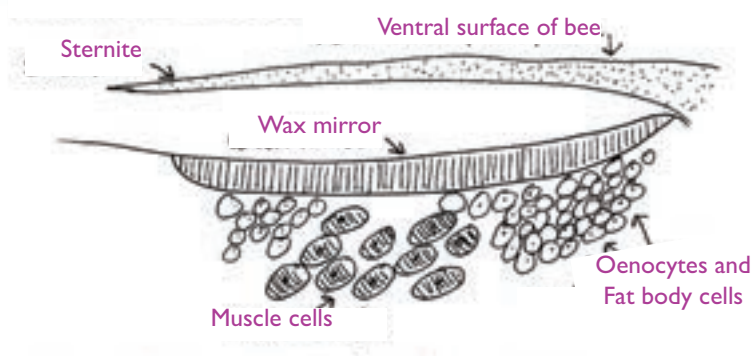
- Hydrocarbons (14%)
- Monoesters (35%)
- Diesters (14%)
- Hydroxypolyesters (8%)
- Free acids (12%).

Each of these major groups contains a large number of compounds, some only present in trace amounts. Analysis of beeswax by chromatography and other means show that there are differences between *Apis mellifera* (the European honey bee) and the Asian honey bees (*A. cerana*, *A. dorsata* and *A. florea*). Comb wax from the European honey bee is consistent in its composition. Differences do exist, however, between comb wax, brood wax and fresh scale wax. Old brood wax contains the shed skins of larvae and silk threads. Comb wax has been masticated with saliva to soften it and the enzymes present in the saliva (lipases) have converted some of the diesters into monoesters. As well as this, dyes and volatile compounds from the nectar and pollen will have become incorporated into the wax during the process of mastication. Fresh scale wax is white and it is sometimes possible to collect some of the scales from the hive floor where they have fallen during the unsuccessful transfer of individual scales from the ventral surface of the abdomen to the mouthparts.

Wax gland structure

If you examine the ventral surface (underside) of the abdomen of a worker bee you will find four pairs of special structures called wax mirrors. Normally these are hidden between the sternites or ventral plates, but when the wax glands are active it may be possible to see wax scales projecting where the sternites overlap. If the sternite is removed two large pale yellow areas are visible. These are the wax

Anatomical location of a wax comb



Higher power view of the wax mirror

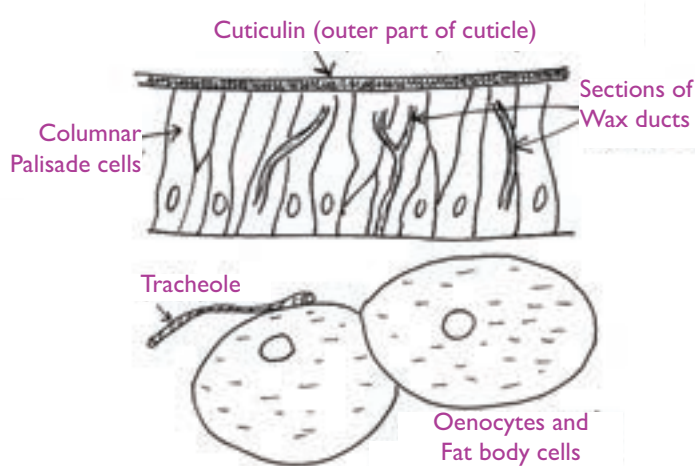


Figure 1. Anatomical location and structure of a wax mirror, drawn by John Chandler.

mirrors. Under these structures lies the wax gland complex made up of three types of cell, namely the fat body cells, the oenocytes and special glandular epithelial cells (illustrated in Figure 1).

The wax mirror cuticle is secreted by the underlying epithelial cells. It is similar in many respects to the rest of the cuticle that covers bees but lacks the outer cement layer which is subject to tanning and hardening over the rest of the exoskeleton. In the wax mirrors the lower layers contain very fine canals, known as wax canals that reach up to the cuticulin (outer) layer. These canals appear to be packed with filaments, about 10–30nm in diameter (1nm is 1 millionth of a mm). Beneath the epithelium lie the fat body cells and oenocytes. Using radioactive isotopes as

labels for precursor compounds it appears that esters are produced in the fat body cells, with hydrocarbons and free fatty acids being produced by the oenocytes. Both types of cell deliver their products to the epithelial cells that underlie the wax mirrors. The role of the epithelial cells is not clear but Lesley Goodman¹ suggests that the cells are responsible for part of the protein fraction of the wax and possibly some other wax components. Some protein has been reported as coming from haemolymph or the fat body.

The wax gland is richly supplied with tracheoles. Their presence suggests that wax production is a very active process requiring a lot of energy. It has been calculated that the energy in one kilogram of honey is required to make sixty grams of

wax. The comb in an average hive uses the equivalent of seven kilograms of honey in its production.

How wax reaches the surface

As with many processes in the bee, the exact mechanism for the transfer of all the wax compounds to the surface of the wax mirror is not fully understood. However, the wax canals and their filaments (believed to consist of wax) extend near to the surface of the wax mirrors. The presence of certain enzymes in this region (esterases, which hydrolyse the ester bonds within the lipids) suggest that the final step in the synthesis of wax occurs in this area. There are no pores or channels across the outer layer of the cuticle that forms the surface of the wax mirror so it has been suggested that carrier proteins, called lipophorins, act as carrier molecules. These would bind with components of the wax on one side of the outer cuticle and transport them across the cuticle where they are then released. This method of hydrocarbon transport is known to occur in other insects. Wax is hydrophobic, meaning that it repels water, but it will associate with lipophorins and this would account for the presence of some of the proteins found in beeswax.

Comb building and its regulation

This is only a small part of the story of beeswax. How bees manipulate the pure beeswax that is secreted onto the wax mirrors into comb is a fascinating story in itself. Wax comb has to be produced within strict limits of accuracy and to a pattern that combines strength with maximum storage capacity. Indeed we have learnt to use honeycomb designs in manufacturing and engineering to provide materials that are both strong and light,

Part of the sequence of comb building

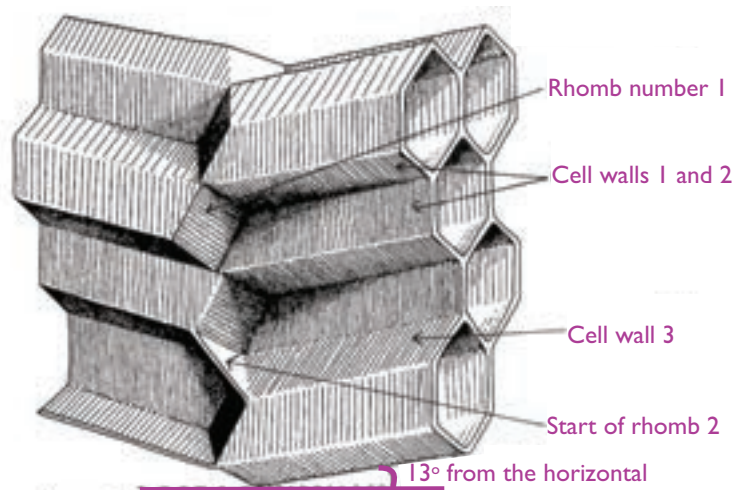


Figure 3. Honey comb detail taken from *Animal Architecture* by Karl von Frisch, 1974, translated by Lisbeth Gombrich and first published in 1975 by Hutchinson. Image used with permission of The Random House Group Limited.

such as in aircraft wings and in the doors of some cars to lessen the effects of impact damage during crashes.

Bees are faced with a manufacturing problem that would tax us to the limit if we were asked to produce a similar structure from, say, plasticene using only our hands with no template to work to. Try having a go if you can find some plasticene!

Why bees start comb building

The trigger for comb building in an established colony is associated with two conditions. There has to be a shortage of storage space in the hive as well as a good nectar flow. If storage space is short the honey sacs of the comb building bees, which also receive and store the incoming nectar,

will become distended and as the duration of this distension lengthens comb building is triggered. This ensures that comb is only built when it is needed, thus saving energy. Comb building ceases in the autumn when the queen stops laying. Old brood nest cells are used for storage if there is a late nectar flow and new comb is not built if the colony is preparing to swarm.

First steps

As with any construction project the first job for the bees to do is to clear the site of debris. Old and broken fragments of comb are scraped away with the mandibles. Wax can be recycled, but if it is too full of debris such as propolis or rubbish it is dropped to the floor of the hive for the beekeeper to clear up later! At the point of construction the bees will form a cluster that increases the temperature to 35°C. This is the temperature that is needed to allow the wax glands to work and for the bees to be able to manipulate the wax into the required shape. Try putting a small ball of wax into your mouth; it soon becomes quite malleable.

As the wax glands become active white flakes of wax will appear on the wax mirrors between the ventral scales of four abdominal segments. These are picked up by bristles near the basitarsal joint of the hind leg.

The flake is impaled on the last row of bristles and pulled away from the wax mirror. It is passed forward to be taken over by the front legs and mandibles (Figure 2).

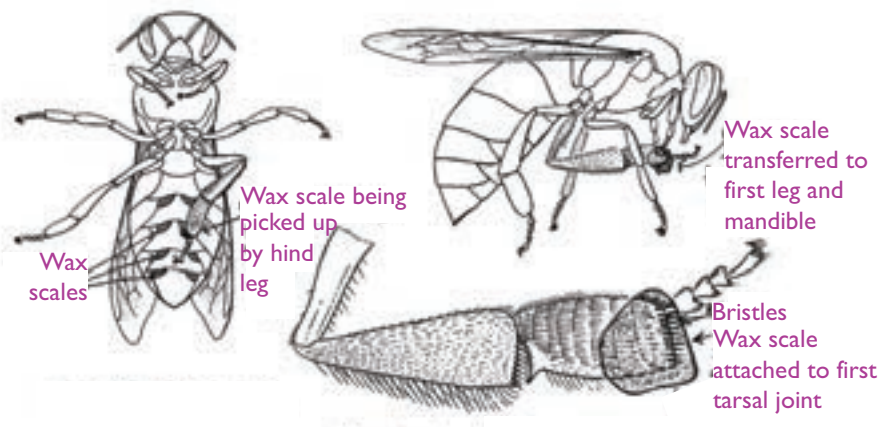


Figure 2. How wax scales are manipulated, taken from *Animal Architecture* by Karl von Frisch, 1974, translated by Lisbeth Gombrich and first published in 1975 by Hutchinson. Image used with permission of The Random House Group Limited.

Holding it in front of her mouth the bee kneads and mixes it thoroughly with a secretion from her salivary glands. Providing the temperature is maintained at 35°C this treatment will bring about chemical changes to the wax, increase its plasticity and add colour from the pollen. Freshly manufactured comb also has a distinctive odour from volatile compounds produced by the bees, e.g. octanal, nonanal, decanal, furfural and benzaldehyde. These are thought to affect the hoarding behaviour in foraging bees. It has been suggested that these volatiles should be regarded as pheromones.

Building begins

When comb building begins in the natural state, i.e. when no foundation is present, bees, laden with a number of scales, climb to the top of the cluster and masticated wax is deposited in little piles on the ceiling of the nest or cavity. As more wax is deposited a ridge, several millimetres long and between two and four millimetres deep, is constructed. Construction of the cells can begin in several places at once. They do not build one complete cell after another. Usually a rhomb-shaped section of the base is made first, followed by the first parts of two adjoining cell walls (a 'rhomb' or 'rhombus' is a parallelogram with four equal sides; an oblique-angled equilateral parallelogram) illustrated in figure 3. Next, another rhomb is added and two more cell

Honey comb architecture as viewed face on

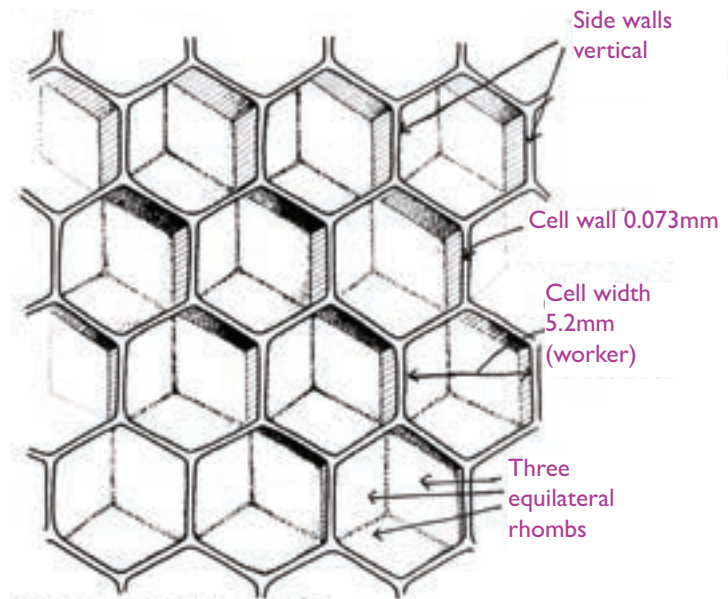


Figure 4. Honey comb architecture as viewed face on, taken from *Animal Architecture* by Karl von Frisch, translated by Lisbeth Gombrich and first published in 1975 by Hutchinson. Image used with permission of The Random House Group Limited.

walls are started and then the third rhombic section is erected, which completes the hexagon, and the last two walls. Right from the start, the cell walls meet at the correct angle of 120 degrees (Figure 4). While the lateral walls of the first cells are gradually being added to, new adjoining cells are being started lower down.

Finishing off

The new triangular shaped sections of comb begin to taper downwards and as they are enlarged laterally, they gradually coalesce. The joins are so skilfully made that no traces of the separate beginnings are visible. The average work 'shift' lasts for about thirty seconds when a bee is replaced by another with fresh wax to deposit. It is amazing that each fresh bee seems to comprehend immediately where it has to start work and at what stage the construction has reached.

Placing foundation in

the hive speeds up comb production as the bees need to produce less wax. It would be interesting to know what percentage of the foundation wax is 'shaped' and reused by the bees in wall construction. It would also be interesting to ponder whether thicker foundation might save bees from having to produce wax. The energy thus saved might manifest itself in greater honey production.

Precision

To prevent thick honey running out, the cell walls are built with a gradient of +13 degrees to the horizontal. The distance from one cell wall to the next is 5.2 millimetres in a worker cell (see Figure 4) and 6.2 millimetres in a drone cell. The thickness of the cell walls is 0.073 millimetre with a tolerance of +/- 0.002 millimetre (just two thousandths of a millimetre or two micrometers). Try doing that with plasticene! But more about wax in July BBKA News.

John Chandler,
Harrogate and Ripon BKA

Reference

1. *Form and Function in the Honey Bee* by Lesley Goodman, published by IBRA.



A bell jar with a wax comb, courtesy of Mike Rowbottom, Harrogate and Ripon BKA Chairman.

The Ten Rules of Modern Beekeeping

I was fortunate in being invited to the UK in April this year to share some of what we do here in the USA related to beekeeping techniques, philosophy and even a bit of science. One of the topics they asked that I cover was 'The Ten Rules of Modern Beekeeping'. That is a challenge and a half if you ask me, but after talking to a great group of folks — from thousands of commercial operations to a group of only-a-handful of backyarders, all in the business for a decade or more, here is what they, and I, came up with.

1. Good queens

What makes a good queen? The first criterion is that she should have been raised in the lap of luxury. All the food she could want, all the care she could get, none of the viruses, none of the diseases, none of the stresses that can happen in a hive. When she emerges she should continue to be extremely well-cared for until she is ready for her mating flights. And those should be as well attended as possible; thousands and thousands of drones in several congregation areas, none related to her in the slightest, and all from colonies that were chosen for their excellent attributes such that when combined, the result would be even better than the best of either. Greater than the sum of the parts if you will. And she should be able to find as many of these as she could possibly desire ... twenty, thirty, maybe more, all happening during perfect flying weather so she is not hindered, delayed, or in any way restricted from joining with all the drones she wants. I consider this 'extremely mated'.

Once mated, she should be put in charge of a colony, maybe yours, that is as clean as can be. There should be new comb everywhere, lots and lots of food, thousands of nurses overflowing with queen food all the time in a hive that has more than enough room to store food, lay eggs and provide protection. She should never be exposed to pests or diseases that could weaken her, or worse, cause her to pass along viruses or other beasts to her children.

And speaking of children, once she starts laying all the eggs she can produce, unhindered by lack of space, poor quality food, or nurses to care for her, she should soon be putting out 1,000, then 1,200, maybe as many as 1,500 or 1,800 eggs a day, every day. She should be an 'egg-laying machine', and she should be comfortably able to do this for three, four, maybe five years without interruption or distraction. Of course she will allow for seasonal differences and delays, but these are not dangerous or debilitating in the least.

2. Good genetics

Of course after all that good care, extreme mating and a perfect place to live, the offspring should be exactly what you want them to be. This is a combination of nature and nurture, and here is what they should be.

They should be perfectly adapted to the place they were born, whether cold, long winters or warm tropical all year. They should absolutely subscribe to your management style i.e. honey producers, pollinators, urbanites, slow to start in the spring or raring to go on New Year's day. And they certainly should be at least nearly immune to the foibles of the pest, predator and disease

world, meaning they live full, productive lives, unhindered by any of the legion of problems less able honey bees are prone to. In fact, they should be so adapted to all of this that never in her life should she be exposed to the poisons used in other hives to thwart the attacks of the evil ones.

And they should be well behaved. So well behaved that you never fear their wrath or fury, and that they always display good manners toward strangers.

When it comes to queens, remember that an average queen in a strong, healthy colony will always do better than a great queen in a sub-par colony.

3. Pest management

The rule is control varroa or die. Use resistant bees, non-chemical controls like drone trapping, broodless periods, or the organic acids, or even the softer essential oils. Maybe even go to the rougher stuff, but control varroa, and the viruses and plagues they carry, or die. The rest are a walk in the park compared to varroa, but do not ignore them, ever.

4. Do no harm

This is directly related to point number 3. The chemicals used to control varroa and other diseases can, and do, harm bees too. Always use non-toxic controls first, then soft chemicals, and as a last resort, pull out the big guns, but only as a last resort.

Garden Plant Workshop at University of Sussex

Friday 12 July or Saturday 13 July

Professor Francis Ratnieks and his team at the Laboratory of Apiculture and Social Insects, at the University of Sussex, would like to invite educators and plant growers and suppliers to join us for an afternoon workshop on either Friday 12 July or Saturday 13 July 2013. The aim of the workshop is to showcase our latest research on which garden plants are good for bees and other pollinators.

The workshops are aimed at organisations and educationalists who either grow or supply plants and/or advise the public about what plants to grow in their gardens for pollinators. There will also be plenty of time to have questions answered. The cost of the workshop is a £5 donation to cover refreshments and administration. Please register at www.sussex.ac.uk/lasi/newsandevents/events/gardenplants.

Note: These workshops are not open to the general public. Also please note that spaces are limited and that we expect the workshops to fill quickly.

Dr Karin Alton
Laboratory of Apiculture and Social Insects
University of Sussex

5. Provide a safe environment

The environment in this case is the whole world bees are in. Inside, keep poisons out, and remove any that enter, whether administered by the beekeeper or those brought home by the bees. Keep equipment in good shape, weather preserved and sound. As far as possible, isolate your bees from other bees, reducing the likelihood of sharing problems. And stay far, far away from agriculture, the second greatest threat to a bee's continued existence after varroa.

6. Enough room at the right time

A colony needs enough room for all the bees, brood nest expansion at the peak of the season, incoming nectar, and stored honey and pollen. And the bees need that room before even they know they need it, but to be on top of any colony the beekeeper needs to know when they will need it, and have it ready and waiting.

7. Enough good food

This is simply good husbandry; enough good food in terms of quantity, quality and timing. Good food comes in many forms however; naturally, when the bees live off the bounty of nature, but also from the beekeeper, so there is never a need, even for a day. And water; lots of water close to home, always. In fact, the future holds, in my opinion, the promise of islands of forage, grown especially for bees, managed by the beekeeper such that the bees never have to forage further than the fence row that keeps them in.

8. Only healthy hives

Above all, keep stress, of any kind, out of sight. Do not nurse failing colonies, rather find the cause, cure it and join the weak to the strong so always one survives, even thrives. And as the old axiom says, take your losses in the autumn rather than clean up the remains in the spring. Requeen before the bees even know the queen is failing, before there is even a moment's hesitation in the command process. Always be proactive with food, queens, medications and available room.

9. Winter well

Take care of the bees that take care of the bees that go into winter for starters. Provide enough good food, both carbohydrates and protein, to last until next summer, and have a strong population when the snow starts to fly so there are more than enough bees all winter long. Provide protection; wrapping with dark coloured covers, wind breaks and have excellent ventilation, all winter long.

10. Food safety

Prevent harvest contamination with fumes or smoke, and keep honey supers covered well at all times. Never, ever for any reason, warm honey past 38°C whether when uncapping with a hot knife, or flash heating to filter in-line, or when in a bottling tank to ease and speed the process to make sure none of the fine things there are driven off or destroyed. Make certain the moisture content is below the magic number, and simply, use common sense when handling any honey because it is food, given to friends, family and sold as a luxury food.

Well, that is the 'Top Ten' I came up with. I imagine there are may be dozens more but these will do for now. Maybe it should be the 'Top One Hundred'.

Kim Flottum, Editor of Bee Culture

First published in *Bee Culture* in May 2013

Editor's note: Remember that Kim keeps his bees in USA. He has raised a number of interesting points that we can all learn from.

Group Visit to National Bee Supplies



National Bee Supplies, based in Okehampton, Devon, recently welcomed members of the Roseland Beekeeping Group to their premises (see photo above) for an informative tour and discussion on various beekeeping topics. The Roseland Beekeeping Group, part of the Cornwall BKA, was formed in 1995 and is currently experiencing an encouraging increase in membership.

Their visit included an interesting tour of National Bee Supplies' manufacturing area where examples of the company's bee hives and related hive equipment were being made, and the merits of using best quality Western Red Cedar were discussed. The group were also taken to the wood drying facility where stacks of cut and dried cedar are kept for many months, sometimes years, prior to use. The visit culminated in the company's large showroom (which is open to the public) for refreshments and a chance to view the large range of beekeeping equipment and supplies.

Bill Stevens, joint owner of National Bee Supplies, said: "We always welcome individual visitors, or large groups, to our premises here in Okehampton, particularly from local beekeeping associations. We are very proud of our facilities and enjoy sharing our success with others."

Mike Sylvester, National Bee Supplies

BBKA News Readers Survey

The *BBKA News* team is seeking your opinions on your monthly magazine and we have enclosed a questionnaire on a pre-paid return slip with your June issue. As an incentive for your valued responses BBKA have donated ten copies of the *BBKA Guide to Beekeeping* by Ivor Davis and Roger Cullum-Kenyon to be posted to the first ten readers who respond and include their name and contact details.

The closing date for survey entry is noon on 30 June 2013.

Are There Enough Flowers to Support London's Bees?

Most people these days are aware that honey bees appear to be in decline. However, this is not the case in Greater London, where, due to a resurgence of interest in beekeeping, we have witnessed a dramatic rise in the number of honey bee hives in recent years. According to data from Fera BeeBase, the number of colonies has increased from 1,677 in 2008 to 3,678 in 2012. This figure could in fact be higher than this, as it is estimated that only 75% of beekeepers register their hives. Given the increased popularity of beekeeping in many areas of the UK, and in particular in London, can we be sure there is sufficient forage to support these numbers of honey bees?

Changes in land use

Many older beekeepers will recount the numbers of colonies present in London in the post-war period when beekeeping was far more popular than it is today, claiming that ample forage was available then to support these colonies. However, London of the 1940s and 1950s was very different from the London which exists today. The city has grown considerably in size, with larger areas developed for housing, industry and road networks, resulting in a reduction of green space. Consensus increasingly points to one of the major causes of the decline of many species of pollinators as being changes in land use. This is primarily more intensive agriculture, but also an increase in urbanisation since the Second World War, leading to both a dearth of food for bees and a shortage of nest sites for unmanaged bees across the UK.¹ For instance in Greater London, it was found that over nearly a decade (data collected 1998–1999 to 2006–2008) hard surfaces in gardens increased by 26%,² while on average 17m² of vegetation has been lost in a typical garden. London has approximately two million abodes with gardens, including those in shared flats and multiple residence buildings.

Impacts of changes in urban landscape

A steady increase in the number of cars in the UK over the past thirty years has contributed to a third of all houses now having paved-over front gardens (studies by the RAC Foundation).^{3,4} With busy life styles, the need for extra storage space and the popularity of *al fresco* dining all contribute to an increase in the need for low maintenance gardens, with flower borders, shrubs and trees now playing a secondary role in the garden.

Grass mowing regimes in urban areas also leave few common insect forage plants to flower, e.g. clover and dandelion, and research suggests that this decreases the diversity of insect species.⁵ Urban parks and gardens featuring borders of traditional colourful bedding plants often have little wildlife value. Bedding

plants are big business for garden centres and nurseries; according to the Horticultural Trades Association, they represent over a third of consumer spending on garden plants, but due to intensive plant breeding, many of them offer little or no nectar or pollen.

However, all is not lost. Evidence still supports the fact that urban gardens are an extremely important plant-rich resource for insects. A Birmingham study suggested that although higher levels of urbanisation decreased both the diversity and abundance of pollinators, there was an increase in pollinator communities in good sized habitat patches, particularly those rich in flowering plants.⁶ The University of Sheffield's BUGS project (Biodiversity in Urban GardenS) looked at the diversity of species and habitats in gardens across the city of Sheffield by carrying out a telephone survey of householders selected at random. The study found an average of 119 plant species per plot, of which only 42% were native. In contrast, in a thirty year study (1972–2002) of her small, suburban garden in Leicestershire, Jennifer Owen recorded 2,673 species of plants and animals. Using several

trapping and monitoring methods, she found 1,997 insect species, 474 plants, 138 other invertebrates (such as spiders, woodlice and slugs) and 64 vertebrates, 54 of them birds. Jennifer even discovered four species new to science.

What are bees' needs and can they be met?

To ascertain whether there are indeed enough flowers to support London's bees, we need to provide answers to the following questions. How much forage is needed to feed London's existing



Honey bee on Helianthus. Photo by Dr Karin Alton.



Starcom volunteers planting for bees. Are you inspired? Photo by Mark Patterson.

bee population? How much forage is available at the moment and can this be improved?



Urban beekeepers tending their 'rooftop' bees! Photo by Tara Moore.

We know that an average sized honey bee colony requires the equivalent of 300 to 500 lbs of nectar and 100 lbs or more of pollen per year⁷ before there is any surplus for the beekeeper, but how does this translate to the area of forage needed? Despite research to calculate the exact nectar yield (kg/ha) produced by plants^{8,9} such as dandelions or phacelia, because of the widely changing variables such as soil conditions, strain of the plant, prevailing weather, water availability, exposure to sunlight, etc. this remains a difficult question to answer.

However, we do know that beekeepers maintain honey bee colonies at artificially high levels not only through the splitting of hives, but also by feeding the colonies in times of low nectar flow. We also know from annual honey surveys conducted by the BBKA that London honey yields have been reducing since 2005. Many studies also show that increasing urbanisation results in loss of insect species diversity.¹⁰ This would suggest that food availability may be a limiting factor.

Recent figures from BeeBase indicate that within a 10 km² area



Honey bee exploring a foxglove flower. Photo by Helen Howarth.

in Central London there are 608 apiaries registered. With an average of three hives per apiary (and adding Fera's suggested extra 25%), the number of hives amount to 2,230 or just over 0.9 hives per acre, much greater than Brighton, for instance, which hosts 0.01 hives per acre within the city boundary. In fact, the hive density in Central London is similar to the recommended hive densities for commercial fruit pollination, which is in the range 0.4–5 per acre.¹¹ The scientific literature average is 1.5 hives per acre, and this is the general recommended number for apple growers. Michigan State Department of Agriculture advises one hive per acre of pears, plums, peaches, strawberries, raspberries, sweet cherries, and some varieties of apple. These crops flower for only a few weeks before honey bee colonies are relocated to another crop requiring pollination.

Clearly, London's landscape is far from comparable to an agricultural setting. It, therefore, makes more sense to address the lack of forage for our bees and other insects, rather than to artificially increase the honey bee population even more.

The London BKA, Greenspace Information for Greater London (GiGL), The Bee Collective, Groundwork and FlowerScapes are pooling their resources to undertake a detailed forage mapping exercise of London's green spaces. Using GIS



Urban beekeepers at work nearer the ground. Photo by Tara Moore.

technology and the most detailed data sets available, including satellite imagery, Ordnance Survey maps, habitat surveys, green space condition surveys and the positions, age and type of London's street and parkland trees, we soon hope to have useful data on where and how much forage the capital has to support its insect pollinators. The resulting data sets could then be used to identify areas of London with scope for improvement, particularly in parts of London where hive densities are high.

Moves to improve pollinator forage

Awareness of the problems facing honey bees and other pollinators is now fuelling a growing trend in pollinator-friendly gardening. The colourful annual mixes featured at the 2012 Olympic Park have boosted enthusiasm for meadow-style plantings, and TV programmes such as Sarah Raven's 'Bees, Butterflies and Blooms' have encouraged local councils and the public to reconsider the species and varieties they choose to grow in their gardens. Individuals and community gardening groups are now setting aside corners of their gardens specifically for bees. One such example is Westcott Park Community Garden in West London, where residents have spent £4,000 on planting to ensure their bee hive is 'supplied' with year-round forage.

Corporate businesses, previously keen to set up hives for their employees, are now helping to fund the creation of forage patches in some of London's public parks, not only improving their green credentials, but also giving cash-strapped council-run green spaces a much needed boost. These excellent projects will undoubtedly lead to future benefits for our pollinators and for us. But can more be done? One of the '132 PlaNYC' initiatives undertaken in New York is a citywide programme with an ambitious goal: to plant and care for one million new trees across the city's five boroughs over the next decade. In a similar venture here in the UK, the Mayor of London has released funds to plant 10,000 trees in London focusing on native flowering trees rather than the London Plane, which has little wildlife value. The Mayor's Office also supports the Pocket Parks Programme aiming to deliver one hundred new or enhanced pocket parks across London by March 2015. The Parks for People programme initiated by the Heritage Lottery Fund has invested £10m into improving London's parks and green spaces, e.g. Burgess Park in Southwark has acquired new large-scale prairie style planting schemes.



The results of FlowerScapes pollinator mix. Photo by Dr Karin Alton.

At the time of writing, results of the 2012–13 BBKA winter survival survey have yet to be published, but after a cold and wet 2012 summer and a prolonged chilly 2013 spring, losses are expected to be high. The unpredictable weather together with mortality through pests and diseases may well act to stabilise the population of honey bees in our cities, but this should not deter us in helping our bees and other insects by choosing plants that are rich in nectar and pollen for our gardens and parks. There are many suitable plants to grow, and guidance can be sought in reference books such as IBRA's *Plants for Bees* by Kirk and Howes <http://www.ibra.org.uk/articles/plantsforbees> and numerous websites including the London Beekeepers' Association's own 'Flowers for bees' page at <http://www.lbka.org.uk/forage.html>. Garden centres are now guiding customers to the appropriate species via a 'bee label', and indeed some nurseries specialise in providing bee-friendly perennials. Advice on how to create, improve or maintain gardens or other green spaces for pollinators, whether for a school, business, organisation or private individual, together with a range of pollinator-friendly flower seeds, can be obtained from FlowerScapes Ltd (www.flowerscapes.org.uk).

After all, unless there are significant, fundamental changes to the way we manage our countryside; urban areas could become the last refuges for many of our native pollinators.

Dr Karin Alton and Mark Patterson



London Beekeepers Association seed packet.
Photo by Hilary Moore.

Dr Karin Alton is a founder of FlowerScapes Ltd. She also works as a honey bee researcher at the University of Sussex, where she is conducting research in the Laboratory of Apiculture and Social Insects.

Mark Patterson is an urban beekeeper and ecologist. Mark is the forage officer for London BKA and also works for the environmental charity 'Groundwork London'.

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Patterson's Page:

Some Changes I Have Seen in The Last Half-century

Roger Patterson has certainly 'earned his colours' in beekeeping; he has now gained fifty years of experience from which to draw upon both as a keeper of bees and as a tutor to newer beekeepers. Here, Roger recounts some of the changes he has witnessed in our craft over the years.

This June I will have kept bees for fifty years. Although in some ways there have been few changes in that time, in others there have been many. In 1963 at least 50% of our members worked on the land in some way, as general farm workers, cowmen, foresters, gardeners etc. and as they were on low wages, many had ten to thirty or more colonies. They augmented their income by selling honey at the gate. In general these were people who had a lot of 'stock sense' and it does not matter whether you are dealing with cows, poultry or bees, the principles are the same. They were practical people and, as few had time to read books, they probably did not know any more than the 'basics', but they knew enough to get by. Virtually all of them were good handlers of bees, as around 25% did not wear any protection at all and virtually nobody wore gloves. Bee suits did not come in until the late 1960s and it is my strongly-held view that they have contributed to the lowering of handling standards.

The modern beekeeper is much more knowledgeable, partly because they need to be and partly because information is much easier to find. They are not so practical though and in cases where something would previously have been repaired it will now be discarded.

In my area there were mainly WBC or 'cottage' hives, with the occasional National. WBCs were a mixture of telescopic lifts, as we have now, and straight-sided ones with plinths. Each manufacturer made to their own design so it was often difficult to get parts to fit. Even the supers and brood boxes varied. Cottage hives had a single-walled brood box with ten British standard frames. There were many designs and the current Thorne's 'Centenary Hive' is an example. With some, the supers had a plinth around the bottom, as the Thorne's version does, but this made super removal difficult. Many beekeepers simply used WBC supers instead. Calico quilts were used instead of crown boards, which became popular later. They laid flat on the frames, creating ideal places for greater wax moth larvae to burrow into the split top bars of frames that were mainly used at that time. Now the most popular hive is the National. In 1963 there were still a lot of hives that had been made during or after the war, when lower grade materials were used, but for a number of years afterwards all hives were made of knot-free material until the later move towards 'seconds', which I approve of.

There have been a few changes in equipment, some better and some worse. Foundation is now sold in plastic bags that keep it fresher than the old method of interleaving with tissue paper. The old sheet queen excluders were made of zinc with slots twice the length of the short slot now available. Zinc is quite a soft metal and the slots distorted, often allowing a queen to gain access to the supers. This rarely happens now. We now have plastic excluders that I have found to be very satisfactory, although the earlier ones degenerated and became brittle. The general move to having items manufactured in the low-wage economies has meant

some lowering of standards of equipment, and at the BBKA Spring Convention I have seen poorly made equipment that would have been difficult to use even if you could avoid cutting yourself!

County Beekeeping Instructors (CBIs) were employed by councils to teach both beekeepers and non-beekeepers about beekeeping. Until their posts were disbanded in the 1980s/90s when financial cuts took place they provided an excellent service. Their own beekeeping was of a high standard and they did much of the lecturing at events, such as conventions in other counties. Volunteers with much less experience now have to do that work and although generally they do it well, some simply do not have the same level of experience or knowledge. Also many lectures are now of an academic nature, not practical, and I think that is a pity.

I started beekeeping immediately after the severe winter of 1962/3 where many colonies were lost. Those that survived were incredibly tough and much better than the bees in general use today. Sadly many beekeepers turned to using imported queens



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and bees, and these did not suit our climate well and many quickly died. I remember the West Sussex CBI telling us he had never seen so many colonies die of nosema and they were mainly the Italian bees that had recently been imported.

Oil seed rape (OSR) changed beekeeping in the areas where it was first grown, which were mainly the southern counties. In the early years the flowering period was much longer and the honey crop much more certain. A crop average of 30lb/colony quickly became 100lb plus with, of course, the necessity for two extractions. It is now grown throughout the UK as the modern varieties have a shorter growing time along with shorter flowering, which I think has contributed to reduced honey crops. Beekeeping in general has not changed very much, with some of the older books having some sound information that is still relevant, although the reader needs to take into account the changes, such as OSR and varroa.

Outside changes have made many differences, including health and safety and food standards regulations. We often complain, but I have not seen honey sold in Brylcreem or pickle jars for a long time! Of course improved communications have been a great benefit. In 1963, probably only 50% of beekeepers had a telephone, but now we all can receive or access information instantly. Certainly this has helped learning, as we can soon find the information we are looking for, providing this information is sound; sadly some of it is not.

One thing that has not changed much is the Bee Inspection service. The 'Foul Brood Officers' as they were called, did largely the same work as they do today, although it is now much more efficient. The combs used to be sent by post for microscopic examination, now the lateral flow device (LFD) will confirm infection in the field. This service is generally accepted to be one of the best in the world and we are very lucky to have it. This is backed up by BDI (Bee Diseases Insurance) that has changed very little. Varroa has changed beekeeping forever and it is a pity we did not take it more seriously. Although we had a ban on imports, it was too late, as the mite was probably here already, unnoticed.

Local BKAs still perform very well but, as with other volunteer organisations, their success reflects their resources at the time. Wisborough Green BKA has been fairly stable, but other associations I have seen have had many ups and downs. Beekeeping politics and personalities often have a lot to do with it, and the occupants of key positions can make a big difference. A welcoming person will have a different effect than someone more aggressive, the latter being remembered much longer than the former.

The National Honey Show was held in Caxton Hall with no other attractions until lectures were started. Although the honey show has not changed much, the lectures, workshops and trade stands have turned it into a full day out. The BBKA Spring Convention was started as a very small affair, but labelled a 'Great Day Out'. It has increased in size over the years to become one of the largest beekeeping events in Europe.

There is currently a huge increase in the number of

beekeepers, which is the second peak I can remember, the last one being the self-sufficiency boom of the 1970s. That only lasted about five years, but put a lot of strain on BKAs who had to deal with many people who simply were not cut out for a practical pursuit where their hands would get dirty. These peaks provide an opportunity for a small number of people who think they can make a name for themselves (or a killing!) and that will always happen.

It would be obvious for me to look back and ask if beekeeping has improved. The answer has to be equivocal. I have always thought that beekeeping should be fun, and to a large degree it still is. For me, varroa and the queen problems we have seen in the last twelve to fifteen years have tipped the balance, as I can see what they have done to both the bees and a major part of my life. I now feel I need to

do a risk assessment just to light a smoker, but at least I can read the newsletter more easily because it has not been through a Gestetner* three times!

Roger Patterson, Wisborough Green BKA
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**Editor's note: a Gestetner was a duplicating device often used for amateur publications like BKA newsletters.*



A Bee Inspector examining a colony. Photo by Ian Homer.

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A Typing Scheme for *Paenibacillus larvae*, the Causative Agent of American Foul Brood

I am in the second year of my PhD at the University of York and Fera, funded by a BBSRC CASE partnership with Bee Diseases Insurance (BDI). During this time I have created a typing scheme for identifying different strains of the bacterium *Paenibacillus larvae* the causative agent of American foul brood (AFB).

AFB is the most destructive brood disease globally, and it is found on every continent where honey bees are kept. It only affects the bee brood; larvae are fed the infective spores in contaminated larval food. The spores then germinate in the mid-gut of the larvae before killing them. The dead larvae then dry onto the side of the brood comb in a stage called scale; this scale is made up of millions of highly infective spores. Colonies that are infected with AFB will usually collapse if untreated. In many countries the best control method is thought to be burning infected hives. Antibiotics only mask the symptoms as they do not affect the highly resistant, disease-spreading spores. Therefore, whether the colony is treated or not the bees are likely to die, leading to large losses in global apiculture. Destruction is the only approved control in UK. Monitoring and controlling AFB is costly both to beekeepers and to statutory bodies. The scheme I have developed will help us to understand the routes of transmission of this damaging and costly disease.

Outbreaks of infective diseases are often the result of exposure to a common source of the pathogen. This means that the organisms causing the outbreak will be clonally related and share genetic characteristics. The identification of strains of *P. larvae* causing AFB outbreaks can, therefore, aid in the discovery of the routes of transmission in a disease outbreak. Identifying strains can also lead us to the source of infection, which means we could prevent further infection. Identifying strain types will also allow us to determine whether a site that is infected year after year is infected with the same strain which would suggest eradication has failed or different strains which would suggest reinfection from an outside source. It may also allow

us to customise control methods depending on the strain type found in a colony.

To identify the strain types of a bacterial species you must use a typing scheme. A typing scheme is a kind of test used to distinguish different strains (or types) of a bacterial species from each other. There are various kinds of typing schemes for different bacterial species based on variances in characteristics such as the types of sugar an organism can metabolise, antibacterials which are produced or the types of proteins made by different strains. Recently methods based on the DNA sequence of bacteria have become more popular due to their precision and the decreasing cost of DNA sequencing.



The 'ropiness' test: A matchstick is inserted into a cell and slowly withdrawn. In the presence of AFB a brown, mucus-like thread or 'rope' will be drawn out. Photo courtesy of The Food and Environment Research Agency (Fera), Crown Copyright; image supplied by the National Bee Unit at Fera.

The current scheme used to type *P. larvae* is known as the ERIC typing scheme. It only identifies four different strains, known as ERIC types (ERIC I to ERIC IV). ERIC types I and II are the most commonly found with ERIC I found throughout the world and ERIC II found mainly in Europe. ERIC III has been found recently in Chile but ERIC IV has not been found in the field in recent years. In terms of global apicultural losses ERICs I and II are the most important types, with ERIC I being the most important type in the UK. I wanted to create a scheme that splits the bacteria up into their ERIC types but gives better resolution so that it can be used to study the population structure and evolutionary history of the bacterium. This

new scheme identifies several ERIC I strain types and several ERIC II strain types. Previous typing schemes for *P. larvae* did not identify many strain types of the bacterium, and some were difficult to use or did not give strains that could be recognised by different laboratories. I have created a scheme based on small DNA sequence differences within seven essential genes. When you combine the sequence differences from each gene you get the strain type (ST). This method is simple to use and easy to transfer between laboratories.

Last year I made a trip to the Bee Research Institute in Germany where I shared my scheme in exchange for gene sequences from *P. larvae* from around the world. The scheme was tested on around 300 samples from 31 different countries and it now characterises more than twenty different global isolates of *P. larvae*, several of which have been found here in the UK. I am currently carrying out analyses on the global distributions of *P. larvae* types to give us some insight into the evolutionary history of the bacterium. The next step will be to study the distribution of these types around the UK in order to understand more about their spread and identify possible sources. I will regrow bacteria from lateral flow devices (LFDs) that have been used by bee inspectors to verify infections in the field. *P. larvae* produces millions of very long lasting spores and because of this it is possible to regrow bacteria from LFDs that are several years old. This will give us a clearer picture of the causes of AFB outbreaks in the UK over the last few years.

My work is supervised by Dr Thorunn Helgason at the University of York, Dr Giles Budge at Fera (the Food and Environment Research Agency) and Bernard Diaper at BDI (Bee Diseases Insurance). The project is funded by a BBSRC CASE partnership with BDI. My trip to Germany was made possible by a grant from COLOSS under the COST grant system.

Barbara Morrissey,
University of York

Adapting to Change: The Evolution of a Society

As with so many beekeeping societies The Chalfonts has seen a tremendous growth in membership over the past few years. At the end of 2007 membership stood at 67, the majority of whom were longstanding. At the end of 2012 our membership stood at 174. This increase in numbers brings a series of new challenges, particularly related to training and to monthly meetings.

Before the influx of new beekeepers (and I am a 2008 fresher) the society was running a regular beginners' course in spring and holding monthly meetings with speakers lecturing on a variety of bee-related topics. This seemed to suit most of the membership with around a third attending the monthly meeting. A few individual members also took the BBKA modular exams on an ad hoc basis.

The burst of new beekeepers into our ranks has meant that we have begun to widen our scope. With up to forty beginners per year over the past five years, we have had to find more mentors. The monthly meetings moved to more practical topics in the spring and summer and a new society apiary has begun. Following an excellent NDB short course that three members attended with Ken and Dan Basterfield, we set up a pair of successful queen rearing groups. In 2012 we started a monthly Managing Bees course during the spring and summer, aimed at members who had taken on bees in the previous year and with the intention of offering advice based on the conditions outside at the time. Beyond this we have been running evening sessions to study for the BBKA modules.

All of this activity takes time and coordination. At the end of 2011 the committee decided that it would make sense to set up a small sub-committee to oversee the programme. This smaller group has created the calendar for the year and has plugged in all of the activities that we run, coordinating many of the new events. We have also included the county and national events that we encourage our members to attend, to enter and to win prizes at! The final result is a colour-coordinated calendar that shows clearly all of our activities, with the colours referencing the types of activity. You are most welcome to look on our website at <http://www.chalfontsbeekeepers.co.uk/>

whats-on/ and click on the 2013 printable programme to see how we have put this together.

As part of these developments it has been a joy to be able to invite speakers from further away, many of whom come as specialists in their field. Professor Robert Pickard, Dr Alan Bowman, Dan Basterfield and speakers from Inscentinel have spoken

beekeeping, with particular emphasis on those who had just experienced their first winter. These ripening beekeepers were encouraged towards the BBKA Basic Assessment and nineteen passed in 2012. For those beyond the Basic, the breadth of knowledge provided in each Module syllabus is both breathtaking and challenging, while the Husbandry Exams provide a more practical way to prove your

2013	January	February	March	April	May	June
Tue 1	Bank Holiday					
Wed 2					1	
Thu 3					2 Queen Rearing 1	
Fri 4		1	1		3	
Sat 5		2	2 Bucks County Seminar		4	1
Sun 6		3	3		5	2
Mon 7		4	4	1 Bank Holiday	6 Bank Holiday	3
Tue 8	Committee	5 Beginners 2 The Colony	5 Beginners 2 Beekeeping Year	5 Beginners 2 Blue Products	7	4
Wed 9		6	6	6	8	5
Thu 10	Module 2	7 Module 2	7	4 Queen Rearing 1	9 Module 1	6 Module 1
Fri 11		8	8	8	10	7
Sat 12		9	9		11	8

A section of the calendar of events taken from the Chalfonts Beekeepers Society website.

to us in recent times. As we have grown in our thinking, it has been a pleasure to offer speakers hospitality with one of our members in advance of the meetings and overnight when appropriate; Aberdeen and Devon are not short evening trips to Buckinghamshire. It has also been delightful to welcome members from other local societies to our meetings. Our main meetings are now regularly attracting between sixty and eighty people.

One of the greatest challenges has been widening the range of speakers who come to us. We have begun to compile a list of universities and colleges with wider links to the beekeeping world, in an effort to find professors, lecturers, researchers and students we have not previously heard speak. If anyone knows of a list that already exists, it would be helpful to have a copy. Our members have a thirst for knowledge and our programme seeks to meet that need.

All these developments are bearing fruit. We are now at the stage where we have the means to support ourselves in the production of new queens. The new Managing Bees course was aimed at anyone who wanted to improve their practical

skills and to push yourself to the next level. We currently have three groups studying for different Module exams, and we may have more later in the year.

Year by year, it is undoubtedly the case that new beekeepers who experience the current levels of activity will want more. We, too, would like to go further by running a weekend beginners' course in addition to the course on weekday evenings. We would also like to work with our neighbouring societies to develop, jointly, workshops on microscopy, woodworking and other areas of interest.

As a group of volunteers we recognise that there are limitations in developing much further with the limited time at our disposal. However, we have now begun to look at ways to succession plan. Our aim is to find people to join or replace us as trainers and organisers, to enable us to look at further developments we might make in the future. This may also allow us a little more time to enjoy the beekeeping world.

Gordon Cutting,
Chalfonts Beekeepers' Society,
Buckinghamshire

Bees Throughout The Ages:

Bees in the Modern World

So far in this series we have taken a journey from the origins of bees, through ancient civilisations, and explored the relevance of bees in religion. In this final article of the series we will explore bees in the modern world from the 17th century onwards.

17th and 18th centuries

With the help of human migration, bees spread across the world. Honey bees were brought to America by English colonists in the early 17th century.



'Tanging' a swarm as envisaged by Wenceslaus Hollar in an engraving in the fourth of Virgil's Georgics. Taken from World Story of Beekeeping and Honey Hunting, 1999, by Eva Crane and published by IBRA, with permission from IBRA.

19th century

Beekeeping became a commercially viable activity aided by several important inventions including frame hives, the smoker, comb foundation and the honey extractor. Lorenzo Lorraine Langstroth invented moveable comb hives. He was the first person to make use of an earlier discovery by Huber of the bee space; the specific distance between wax combs, which bees did not fill in, but rather kept the space open as free passage. Using this principle, Langstroth designed wooden frames to fit within a rectangular box with the correct bee space between successive frames. This allowed frames to be removed and inspected without harming the bees. It also meant that honey could be extracted without destroying the comb.

The honey extractor was invented in 1865 by a Czech beekeeper and designer called Francois Hruschka. Before this, honey was extracted by pressing the honeycombs. All the extractors have a basic structure consisting of an outer tank, an inner drum in which the honeycomb is placed, and a drive element. As the rotor turns, honey is sprayed against the walls of the drum due to centrifugal forces and is released for collection via a tap (see article on honey extraction on page 11).

Even in ancient times, as we have seen in this series, it was well known that smoke calmed bees. The underlying mechanism is still not known but it is thought that the smoke masks alarm pheromones released by bees. The problem of delivering a long, steady stream of smoke to calm bees during inspections was finally overcome in 1870 with the invention of the Moses Quinby smoker. Moses Quinby was reportedly the first commercial beekeeper in the United States.



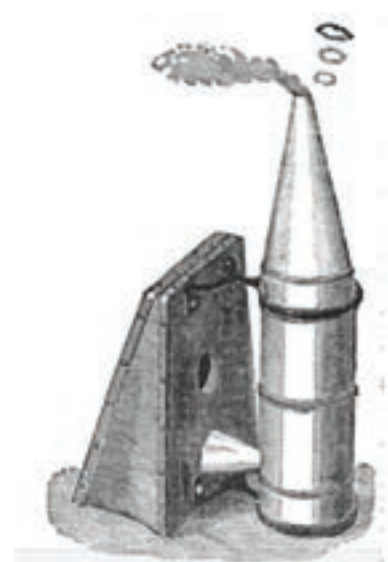
Lorenzo Lorraine Langstroth (1810–1895), shown here aged 80 years. Photo taken from 'Langstroth on the Hive and the Honey Bee' 1890; Image supplied by Northern Bee Books.

20th and 21st century

Global warming is a major phenomenon of our times having widespread effects on our ecosystem. Although bees are resilient and able to adapt to changes in temperature, subtle changes may have unexpected effects such as accelerated growth of pathogens which could harm bees. With the rise of industrialisation in the less economically

developed world and the lack of consensus on how to tackle this at the G8 summit this may become a major problem in the decades ahead.

Even now, colony collapse disorder, the phenomenon where worker bees from a hive suddenly disappear without trace has become a major and worrying problem in North America. Similar disappearances have also occurred in a number of European countries. It is still not clear what the underlying cause of colony collapse disorder is but a number of factors may be responsible.



The improved Quinby smoker. From: World Story of Beekeeping and Honey Hunting, 1999, by Eva Crane and published by IBRA, with permission from the publishers.

These examples serve as a reminder that we need to work with nature in order to sustain the benefits nature provides for mankind. Unless we do this, we risk denying future generations the benefits of nature we enjoy today.

This series about Bees Throughout the Ages has highlighted just how important bees as well as their keepers have been throughout history. I hope you have enjoyed the series and I hope it has provided inspiration for all of you to continue supporting bees for future generations to enjoy!

Dr Ahmir Ahmad,
ahmir@drbeekeeper.com
www.drbeekeeper.com

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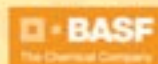
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A General Husbandry Training Initiative

Rationale

Most associations have seen a large influx of new beekeepers. Training of beginners has been very effective, and has increased numbers for many associations. This has led to a significant number of people looking for continuing development of their skills and knowledge. There is consequently a need for competent trainers to teach beyond the beginner level to accommodate the needs of these 'improvers'. Similarly, there are not enough assessors to assess the exam candidates coming through, even for the Basic Assessment.

From a BBKA perspective, there is no magic wand to wave to produce trainers and assessors for the Basic and beyond. We understand how this situation is straining the resources of local associations, and see that the route through this is to expand training at the improvers' level. This General Husbandry Training Initiative is aimed at providing local support for training candidates at the General Husbandry (GH) level who will then be available as potential trainers and assessors to help with the workload.

There is an important general educational principle that for a trainer to teach competently at one level, s/he should be qualified to the next level up. The same applies for assessors. It is often said that the best way to understand something is to teach it to others, but we would prefer trainers to have more skills and knowledge than being just 'one page ahead' of their students. Thus we anticipate that increasing the number of GH certificates achieved will increase both numbers and quality of potential trainers.

In recent years the success rate in GH assessments has not been high. Fundamentally, there is a published syllabus and an assessment can be booked, but there is generally nothing provided in the way of structured training and preparation for candidates. Is it any wonder that candidates are failing in the absence of any such support? We want to address this lack of preparation to ensure more GH successes in future.

New initiative

This initiative is being led by the BBKA Education and Husbandry Committee and supported under Fera's Healthy Bees Plan. Trainers' expenses will be covered by the BBKA. A team of General Husbandry trainers has been assembled that will cover the length and breadth of England and will provide support and leadership of local GH training initiatives. Each trainer is qualified to at least Master Beekeeper level and is familiar with the GH assessment procedure. Where good practice and training already exists at this level, this initiative is not meant to supplant it; rather it is to provide support where it is needed. David Blower, the BBKA's Training Coordinator, will act as a central point of contact for individuals and local associations who wish to become involved.

Due to the nature of the General Husbandry Assessment, candidates often need to prepare over the course of at least one season. The pre-requisites are not onerous, just beekeeping for three years essentially, but the practicalities of having the required number and condition of stocks, clear and accurate hive records,

and queen raising ongoing at the time of assessment means that preparation takes time. Consequently, we are proposing that candidates would start this GH training at least a season before they apply for the assessment, rather than as a quick refresher immediately prior to a GH assessment.

The envisaged programme will start with an introductory session, where the pre-requisites and the syllabus for GH can be discussed. At this stage trainers will start to develop a list of skills and knowledge that need to be developed. Based upon this list, further sessions will be arranged that may cover the underlying theory or practical skills, or a mixture of both. There will be a significant onus upon the students to undertake their own reading and practice. The trainer will act partly as tutor, teaching and mentoring, and partly as facilitator, identifying ways and opportunities for students to improve at their own pace. Each trainer has the freedom to approach this in their own style and to best effect.

Contrary to popular belief, this is not wholly a practical assessment — some underlying knowledge is essential. It is likely that theory work will be done outside of the active season, and that practical work will be undertaken in the active season. The precise format of the programme will be down to individual trainers to arrange in response to the needs of their group of students. A typical training programme might look like this:

Winter 2013	Initial meeting; Discuss syllabus, strengths and weaknesses; Plan remaining sessions
Winter	Theory session 1
Winter	Theory session 2
Spring 2014	Practical session 1
Spring	Practical session 2
Summer	Practical session 3
Summer	Mock assessment
Winter 2014	Review and Refresher
Summer 2015	GH assessment

How will it function?

Enrolment will be managed on behalf of the BBKA by David Blower, in much the same way that Bob Gilbert manages enrolments for the Correspondence Courses. There will be an enrolment fee of £35 per student per year of study.

Trainers will arrange an introductory meeting with their student group, at which the training needs of the group will be identified and a training plan will be devised to meet these needs. A series of study meetings will be arranged, where the trainer will lead the group in discussion or practice of particular topics. Other areas can be covered with directed private study e.g. attending lectures, specific apiary visits and demonstrations, and other practical activities. The trainer might identify other resources such as conventions and lectures that may address some of the learning. The intention is that where opportunities to learn already exist they are taken advantage of rather than being duplicated.



Map of participating trainers, by Ken Basterfield.

It is often said that the GH is daunting because the assessment takes place at the candidate's own apiary. To provide a level of awareness of what to expect, mock assessments will form part of the training programme. It is hoped that this insight will greatly improve student confidence and competence, allowing them to give best account of themselves on the day.

Individual progress towards readiness for the GH assessment can be tracked using a combination of self-assessment and trainer-assessment of skills and knowledge. Progress record cards have been prepared from the GH prospectus in order to assist with this.

Where will groups meet?

For efficient use of the trainer's time and for the benefits of shared learning, this cannot be a 1:1 activity, rather it will take place in the form of small study groups. Due to the geographic spread of trainers it is expected that local groups will arise flexibly and that travel can be kept reasonable for all involved. It is not intended to be confined to association or county boundaries.

More information

If you want to know where and who your nearest trainer is, you can find this out from your local Association Education Secretary, or by approaching David Blower via the BBKA website; if you already know one of the trainers then approach them directly. Similarly, the trainers will be making their availability known through local associations.

Ken Basterfield, Education and Husbandry Committee

Bees To The Rescue

On a recent trip to Africa I visited a game conservation park in a very remote area of northern Mozambique called Niassa National Reserve. Niassa is a really remote and unknown part of the world, and environmentally interesting. They have no

poaching for ivory. To get to Niassa you fly to Pemba in Northern Mozambique then it is two hours by plane to Legenda River camp, then two hours in a Landrover, then you must cross the river in a canoe! But it is worth it when you get there.

source for the village and an alternative source of income. Historically a bees' nest is totally destroyed by the man collecting honey, but not here.



Beehive fences. Photo by Lucy King.

electricity except from solar power and the only carbon footprint is from petrol. There are lots of elephants in the area and lots of

Here Colleen and Keith Begg are running a project to save carnivores and build an ecologically friendly community. They have been turning poachers into gamekeepers and trying to send their children to school. It is working, and 22 unskilled men from Mbamba village have been taught masonry, brick-making, carpentry, plumbing, thatching and beekeeping.

Beehive fences are being tested. Elephants from the bush regularly raid the village maize crops and although hungry people cannot care about conservation, elephants fear bees. These fences, which were developed in Kenya by Dr Lucy King of 'Save the Elephants', are now being tested in Mozambique. Lucy went to Niassa to help the Niassa Carnivore project team make the first beehive fence. Five beehives have been colonised already. The beehives are hung on ropes in a ring round the crops. The honey provides a wonderful food



Mbamba's M12 Beehive. Photo by Lucy King.

Dr Lucy King has another ploy to protect crops from marauding elephants, a recording of disturbed bees is played and the elephants stampede away. It will not be long before recordings on mobile phones of swarming bees will plague the elephants. But perhaps they will entice the honey badgers!

Sarah Lawley,
Stowmarket Division, Suffolk BKA

On the Bookshelf:

Practical Microscopy for Beekeepers

Practical Microscopy for Beekeepers

Bob Maurer

Bee Craft; 2012; 93 pages

ISBN: 978 0 900147-13-5

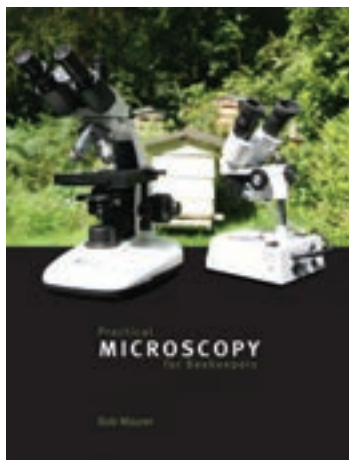
A basic understanding of the anatomy of the honey bee is essential for all beekeepers, and for those who are undertaking BBKA examinations it is vital. Two of the most frequently used books on bee anatomy are RE Snodgrass' magisterial book *Anatomy of the Honeybee* and HE Dade's classic *Anatomy and Dissection of the Honeybee*. Bob Maurer's small book *Practical Microscopy for Beekeepers* (published in 2012 by Bee Craft; ISBN 978 0 900147-13-5; pp.93) is an excellent additional and straightforward guide to microscopes and their use. The book enables both amateur and professional beekeepers to make use of equipment and techniques which make it possible to explore the miniature world of bees; their diseases and their food. Despite being a relatively slim volume, this book covers a wide range of subjects in a friendly and direct manner. The emphasis throughout is upon practical techniques that are needed to make best use of a microscope.

The book starts with the issues surrounding choosing of an appropriate light microscope. There is a careful description of the differences between compound and dissecting microscopes. The various parts of a microscope are described and illustrated. How the microscope should be set up for maximum effectiveness is outlined very clearly.

The photographs and line drawings in the book are particularly noteworthy. This is especially true in the chapters that deal with screening for adult bee diseases and also the making of pollen slides. The making of bee anatomy slides is also described very well and once again the emphasis is upon simple and straightforward techniques.

The heart of this book can be found in the chapter that deals with the dissection of the honey bee; Maurer writes: *'There's a wonderful sense of achievement when you discover, for real, all the bits you have seen in text books. You will gain a much better understanding of the internal organs and the way they interact.'* Maurer commends the use of Dade's *Anatomy and Dissection of the Honeybee* (published by IBRA) — particularly the set of laminated drawings that comes with the latest edition — in conjunction with this book.

The book concludes with a series of short chapters on a range of practical issues and techniques that must be mastered to gain maximum benefit from using a light microscope. The use of high magnification oil immersion lenses is outlined and how to avoid damaging either lens or the slide. Maurer's DIY style can be seen clearly in his description of how to make a needle for use in acarine diagnosis, and also in his splendid homemade warming plate for the production of slides. There is a very useful outline of the use and calibration of an eyepiece graticule.



The book concludes with the tabulation of the various magnifications needed for the microscopic examination of honey bee pests and diseases and also for the analysis of pollen grains. There is a glossary of terms, a list of useful contact names and addresses and also a list of books for further reading and study.

The book also draws attention to a joint initiative between Bee Craft and Brunel Microscopes Ltd. called 'Microbox'. Microbox is a kit of various sundry items that are needed to make a start in this fascinating part of the craft and science of bees and beekeeping.

Bob Maurer is clearly an enthusiast for microscopy in beekeeping. He says: *"Why not set up honey bee disease identity 'clinics' and microscopy classes for your association? Above all have fun and enjoy the fascinating world of microscopy for beekeepers."*

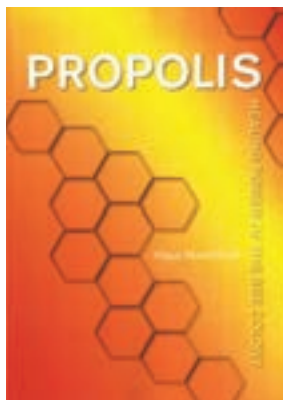
The reviewer was given this book by a good friend with the almost apologetic words: "I'm sure you'll find this too simple and basic". Not so; this small book stands well in its own right, and as the saying goes — 'it does exactly what it says on the tin'.

Dr Stephen Palmer, FRGS FLS

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On the Bookshelf: Propolis

Propolis
Klaus Nowottnick
Northern Bee Books;
Paperback: 70 pages
ISBN: 978-1-908904-
15-7

Klaus Nowottnick is a German beekeeping writer and this book represents the result of long experience and study of the subject matter. It discusses the history, origin, chemical make-up and uses by the honey bee and human beings of propolis. It contains (illustrated by many photographs) methods for collecting and refining propolis, recipes for tinctures and ointments and instructions on how to use them for various human ailments.

As with so many books nowadays, this would have benefited from more rigorous editing and proof-reading. There are several repetitions of text and of recipes, some photos are incorrectly captioned and terms are used without explanation or definition, e.g. several rather idiosyncratic references to 'Grusinian Folk Medicine' are made without explaining that Grusinia is an archaic Russian name for Georgia. No translator is acknowledged, so I assume the author has re-written his book in English. If so, his linguistic abilities are admirable, but there are several spelling mistakes and invented words. Most of these will not spoil most readers' understanding of the text but there a few 'Germanisms', e.g., 'magazine', meaning box or chamber (as in a hive) and 'cross-cut' meaning cross-section. More serious still is a glaring factual error: propolis is not excreted by bees from indigestible pollen husks as stated on page 14, it is gum or resin collected by bees from buds and wounds in trees and woody plants. Such an assertion is unscientific and totally contrary to common sense; every beekeeper knows how careful honey bees are to defecate outside the hive. The presence of what are effectively faeces in propolis would undermine the very qualities, antibacterial and anti-fungal, which are praised so highly in this book.

The antibacterial and anti-fungal qualities are indeed highly praised. Despite occasional exhortations to consult a qualified doctor before self-administering propolis cures, this book would have you believe that propolis is a cure for every ailment from cancer to skin blemishes and from tooth decay to stomach problems.

When imbibing propolis tincture one must obviously be aware that the main component is alcohol, in a particularly concentrated form. One is therefore thankful when Nowottnick advises caution about a prescription of propolis tincture for liver or kidney ailments, as the alcohol and the resin components could be distinctly harmful here. Surely, however, the same applies to its use for respiratory ailments and any other internal administration?

One other point; the section in the original book on the legal situation of marketing propolis products is missing from this English edition, presumably because it only referred to German/Austrian law. The

situation here in the UK is similar, however, and anyone marketing propolis would have to refer to other sources to ascertain what is allowed and what might cause them difficulties with the authorities.

So, a thorough and painstaking book which comes with a few health warnings about its contents, but is an indispensable addition to the library of anybody interested in this aspect of beekeeping and this hive product. Once again, credit should be given to NBB for re-publishing an important work in the beekeeping bibliography.

Pete Sutcliffe,
Cheshire BKA

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Beekeeper knowledge and engagement with science and policy

Honey bees form an important part of the UK's insect pollinator community. Like so many insects honey bees have experienced population declines in recent years for a variety of reasons. However, honey bees are lucky, they have a large community of people devoted to their care and maintenance, who spend time and energy ensuring that honey bee colonies have all the food and medicine they need. Thus, beekeepers are increasingly regarded as vital for the long-term survival of the honey bee in the UK.

Honey bees have long been a model species for ecologists, ethologists and many other scientists, so a lot is understood about their biology and life history. Given the long history of beekeeping, and the role of beekeepers in supporting honey bees, it is curious that there has been remarkably little social science research into beekeeping knowledge and practices. My PhD project aims to investigate the gap in our understanding about beekeeper practices and knowledge. My supervisors and I wanted to know more about beekeepers: what they do, what they think about issues such as bee health management and pollinator decline, where they get information from, who they turn to for help and so on. We also wanted to know more about the wider beekeeping community. Beekeeping is complex, both at the hive and socially, with a diverse range of organisations, clubs and specialist groups all catering to the beekeeper's every intellectual and practical need. As well as this, bee health is a highly topical issue, with a lot of government funding and research going on nationally and internationally to try to understand bee diseases and links to wider environmental issues. But ultimately, effective bee health management relies on individual beekeepers tending their hives. This places a huge onus on the beekeeper, and we wanted to understand the challenges of managing honey bee health for beekeepers.

My PhD is interdisciplinary, with funding from both the Natural Environment Research Council and the Economic and Social Research Council. It uses a mix of social and natural science methods to hopefully bring new perspectives to understanding and managing honey bee health management. We have four project objectives:

- Try understand beekeeper knowledge and husbandry practices.
- To test the effects of supplementary protein feeding on managed honey bee colonies, both to investigate whether novel forms of supplementation may be a useful tool for beekeepers, and as a case study to understand beekeeper engagement with science and scientists.
- To investigate current forms of engagement between the beekeeping communities, national statutory bodies and NGOs like the BBKA.
- To encourage knowledge-exchange between beekeepers and research scientists to contribute to future management of honey bees.

Over the last two and a half years, I have been carrying out field work to try and achieve these project objectives. My field area has been Lancashire, ranging from the southern Lake District down to the Wirral, and reaching a short way eastwards into the Dales. I have used three main methods to collect data: interviews with beekeepers and other stakeholders (sixty carried out so far);

observation and participation in beekeeping activities (with around thirty beekeepers and five clubs); and experimental protein supplementation of hives, as well as pollen trapping. In addition, I have trialled methods like keeping diaries, questionnaires and stakeholder mapping.

Data collection is still ongoing, especially from the natural science experiments which are continuing in 2013, but there are a few themes already emerging from preliminary analyses which I hope will be of interest. One of these is education. This is something I know many beekeepers are passionate about, whether they are novices on a journey of discovery or experienced mentors helping people through beginner courses and guiding them through Basic exams. It is a big priority for national umbrella organisations like the BBKA and also for the National Bee Unit. Beginner beekeepers are fortunate to have a structure of clubs and organisations that support them on their first steps to becoming a beekeeper, and continue to support them if they choose to continue to the more formal learning opportunities. This entire structure is built on a lot of volunteer time, especially at the local and regional levels. As many of you will have experienced, becoming a beekeeper is rather like taking part in a craft apprenticeship: it takes time, persistence and practice to become a good beekeeper.

According to people I have spoken to at local training courses, the recent and rapid rise in beekeeping interest seems to have placed a lot of stress on the volunteers who run beginners courses. Many clubs have established formal training courses to manage demand for beekeeping tuition, a major change for many trainers who previously taught a handful of novices in their own apiaries. To keep up with increased demand, many clubs have ended up building apiaries, appointing apiary managers and committing themselves to supplying nucleus colonies to beginners to avoid imports of bees to the region. Socially, many clubs have expanded rapidly, occasionally leaving older beekeepers to feel a little isolated and bored as meetings are devoted to basic beekeeping topics.

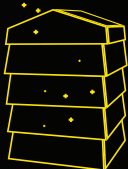
The overall result of this expansion is a dilution of the expertise held by the beekeeping community and huge demands on mentor time and effort. This in turn can lead to volunteer fatigue. Although extensive efforts have been made to support clubs as they undergo this transition, the way beekeeping is taught in many places has inevitably changed from a detailed, meticulous and individually-focused training to larger-scale classroom-based tuition followed by greater reliance on mentors.

None of my work would have been possible without the kindness and interest of the beekeepers in the region and beyond that I have met. From the many visits I have made, I have been able to put together a really full picture of what it is like to be a beekeeper in Lancashire. Similarly, stakeholders at regional and national levels from many organisations have been incredibly helpful and supportive, helping me to understand the scale and complexity of the challenges faced by honey bees and beekeepers in the UK.

Emily Adams, Lancaster Environment Centre,
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The European Union Reference Laboratory for Honey Bee Health

The European honey bee population (*Apis mellifera*) plays an important role in both pollination and the production of honey and other apiculture products. Honey bees, together with a multitude of other insects, birds and even bats are part of the pollinator cohort. By mixing plant genes from different origins, the act of pollination is crucial to maintain sustainable biodiversity in both wild ecosystems and managed agricultural landscapes.¹ Various studies have estimated the economic value of pollination and the specific role of managed bees. The production of 80% of the 264 crop species cultivated in the European Union (EU) depends directly on insect pollinators and the global annual monetary value of pollination has been estimated to be €153 billion.² The value of pollination service in wild ecosystems is even more difficult to estimate.

EU Reference Laboratories (EU RLs) are essential tools in the framework of risk management in the field of animal health. Their role has been recognised by relevant EU legislation on official controls, and by vertical Directives for the control of certain animal diseases. Scientifically sound and uniform testing is a fundamental element for reliable disease diagnosis and for the application of the necessary control and eradication measures. Analyses are also part of prophylactic actions in honey bee health. EU RLs play an important role to support the activities of the Commission and the Member States (MS) in relation to animal disease surveillance, control and eradication. The European Commission has designated the EU RL for honey bee health in the Commission Regulation (EU) No 87/2011.³ This decision was made as a consequence of recommendations in the report on *Bee Mortality and Bee Surveillance in Europe*.⁴ By law, the EU reference laboratory has to coordinate, in consultation with the Commission, the methods employed in the MS for diagnosing the relevant honey bee diseases, in particular by:

- Typing, storing and, where appropriate, supplying strains of the pathogenic agents to facilitate the diagnostic service in the Union.
- Supplying standard material to the national reference laboratories in order to standardise the test used in each MS.
- Organising periodic comparative tests of diagnostic procedures at Union level with the national RLs.

- Retaining expertise on the *Tropilaelaps* mites and the small hive beetle (*Aethina tumida*).
- Proposing standardised tests and test procedures or reference reagents for internal quality control.
- Advising the Commission on scientific aspects related to honey bee health.

Over the last years, increases in honey bee mortality have been reported in several countries within and outside the EU. Therefore, the first task of the EU RL on honey bee health was to provide technical support to a surveillance programme on honey bee colony mortality. In 2011, the European Commission started to set up and co-finance a standardised and Europe wide Voluntary Surveillance Programme to obtain a reliable and accurate measure of honey bee colony losses and information on honey bee health (in the UK, this is referred to as the Pilot Surveillance Programme; PSP). This programme was based on the technical document *Basis for a pilot surveillance project on honey bee colony losses* elaborated by the EU RL for honey bee health. The kick-off meeting was held in Brussels in June 2012. The surveillance procedure aims to study a representative section of the total population of honey bee colonies in each participating country by investigating randomly selected apiaries in order to quantify colony losses and to investigate the prevalence of the major diseases. Epidemiological protocols are consistently implemented in each of the 17 selected MS to provide comparable data.⁵ Subsequent to the training of the bee inspectors for this project in May 2012, the field work has started during the summer 2012 and visits to apiaries and sampling were in process in September 2012.

During this study, apart from the active surveillance of colony losses (overwintering colony mortality rate, season colony mortality rate), the major honey bee diseases are being surveyed and the clinical prevalence of varroosis, American foul brood (AFB), European foul brood (EFB) and nosemosis estimated. The prevalence of the chronic paralysis (CBPV) is also being taken into account, recording the number of cases of showing the typical symptoms of trembling observed. The *Varroa destructor* infestation rate before winter is being assessed. In terms of surveillance for two viruses related to *V. destructor* (Acute Bee

Paralysis Virus and Deformed Wing Virus), participating MS who have been invited can choose between two protocols: infection rate assessment or a case control study to verify if these viruses can be risk factors inducing winter mortality or winter disorder. Finally, this project should ensure an early alert in case of the detection of the two exotic arthropods *Aethina tumida* (small hive beetle) and *Tropilaelaps* spp. mites.

In November 2012, a workshop was organised by the EU RL for honey bee health in Maisons-Alfort close to Paris (France) to present a web-based database to the MS involved in the surveillance programme. This database will allow collecting and saving all the data for all participants; collected data will be stored in the database for EU RL use. However, each MS will have access to its own data.

Conclusion

The EU should establish certain harmonised rules to protect and maintain the health of honey bees, while MS may regulate other aspects of beekeeping and related activities. Beekeepers and their associations are themselves active in other, nonregulated areas such as implementing good beekeeping practices and guidelines.

The Anses laboratory with the EU RL will provide the national and European stakeholders with scientific assistance on issues related to honey bee health. For this purpose, the EU RL is involved in the development of techniques for the detection and the quantification of honey bee diseases (pathogens and pesticides).

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and Magali Ribiere-Chabert,**
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Originally published in *Bee World*.

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The EU Pilot Surveillance Project

Background

In the October 2012 issue of *BBKA News* we have written about the inception of the first EU Reference Laboratory (EU RL) for honey bee health, the Sophia-Antipolis Laboratory of ANSES (French National Agency for Sanitary Safety of Food, Environment and Labour; see logo below). The EU RL's activities are wide-ranging (<http://www.anses.fr/index.htm>), but its primary mission has been the implementation of a voluntary Pilot Surveillance Programme (PSP). The focus of the PSP is to collect standard baseline data for



over winter and within season colony losses, and to identify any associated risk factor, i.e. particular pests or diseases, across the EU.

The National Bee Unit (NBU) is coordinating the UK contribution to this large-scale project, working with 200 beekeepers selected at random throughout England and Wales. During the PSP, NBU Inspectors will visit each selected apiary three times over a period of ten months, collecting a continuum of information about colony health. According to the strict protocol for the project:

- Visit one needed to take place at the end of the 2012 beekeeping season, before the bees overwinter.
- Visit two was required to take place at the end of the overwintering period.
- Visit three must take place during the productive beekeeping season.

Pests and pathogens under surveillance

All apiaries are being monitored for a given list of pests and diseases as follows: varroosis, noseosis (including species typing for *Nosema apis* and *N. ceranae*), deformed wing virus, acute bee paralysis virus, chronic bee paralysis virus, European foul brood (EFB) and American foul brood (AFB). In addition, every single colony in the study will be sampled to allow a varroa count to be established prior to overwintering. All colonies will also be monitored for the notifiable exotic pest species, *Tropilaelaps* mites, and the small hive beetle, *Aethina tumida*. In each case, colony sampling procedures and laboratory diagnostics follow standard protocols developed by the EU RL, so data from different Member States (MS) will be directly comparable for use in the EU policy context.

A summary of the first apiary visits

In the UK the first of our three scheduled apiary visits were successfully completed between August and September 2012. While we have not finished all of the diagnostic tests on the samples collected, Table 1 opposite summarises the scale of sampling achieved. The difference between numbers of colonies inspected and number of varroa counts performed reflects two things: firstly, a small number of colonies originally selected for sampling were found, on first inspection, to be dead; secondly, in some cases, for example where selected colonies were very small, beekeepers may have chosen not to submit 300 bees for analysis. The single 'suspect exotic' (Table 1) proved to be nothing more or less sinister or troublesome than a wax moth larva.

Although at the time of writing we had not yet completed all of the second visits (scheduled to take place between mid-April and mid-May 2013), we are already aware of significant colony losses in a number of participating apiaries. The full extent of losses

remains to be seen but these are not unexpected given the difficult weather conditions of the 2012 season. We plan to collect samples of adult bees from any diseased, failing or lost colonies and screen them for the above pests and pathogens. The third and final apiary visit is expected to take place in July to August 2013. The NBU is indebted to all those beekeepers who are taking part in this study. Your enthusiasm and commitment to the programme is greatly appreciated.

Table 1. Sampling at the first apiary visits

Activity	Number
Randomly selected apiaries visited	200
Randomly selected colonies	917
Varroa counts completed	883
Symptomatic adults	283
LFD tests performed	10
EFB positive	5
AFB positive	0
Molecular analyses	1,166
Suspect exotics	1

The future of the project

This phase of the PSP will run until the end of September 2013. Once analyses are complete, which we anticipate will be in December 2013, diagnostic results relating to each apiary will be available to participating beekeepers. Throughout the project, data are being entered onto the EU RL's own secure online database. The EU RL will collate information from all MS to calculate a variety of 'epidemiological indicators' (measures of losses), including: rate of overwinter losses/MS; rate of within season losses/MS; incidence rates for the following pests and pathogens/MS: varroa, deformed wing virus, acute bee paralysis virus, nosema, chronic paralysis, EFB and AFB.

The EC has confirmed its intention (subject to funding being secured) to continue the PSP on an annual basis. In March 2013 the NBU submitted its proposal for a revised UK contribution for the 2013–2014 project. If the continuation project goes ahead, then we will be working with a 'new' set of 200 randomly selected beekeepers, although the range of diseases surveyed is likely to be similar or the same. We will not know the EC's position until later this year, but will keep readers informed.

Gay Marris and Mike Brown,
National Bee Unit

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Business Corner

BBKA Discussion Forum

During March and into April, it was inevitable that the majority of posts to the BBKA forum involved the late and cold spring. What and how to feed, from fondant to pollen substitutes and even essential oils, as well as keeping the bees warm, produced lots of useful tips from the more experienced beekeepers. Colony inspections had those who have experienced more winters advising beekeepers to reign in their desire to get in and inspect too early and to wait for the warmer weather. Some people were clearly planning ahead with posts on supers and extractors and even scissors for clipping queens. The new examinations thread has proved a hit with questions mainly involving Modules 2 and 6 being answered in detail by BBKA Examinations Board Chairman, Gerry Collins.

A breakdown of posts to the forum in March shows that nearly 5% were posting for the first time, with a further 10% from people having under ten posts to date. We welcome new posts and replies like: "Thanks so much for all the advice and a great welcome. This was my first post on the forum and I am really encouraged by so many helpful responses" are always good to read. If you have not done so before do visit us at <http://www.bbka.org.uk/members/forum.php> and see what the current hot topics are or log in and post.

Finally can I draw your attention to the growing volume of photos on the BBKA gallery? Please follow the terms of use.

James Norfolk, Discussion Forum Moderator

Neonicotinoids: BBKA Statement

Following the decision taken by the EU Commission on Monday 29 April, to impose restrictions on the use of three neonicotinoid pesticides, the BBKA continues to work hard to ensure that the interests of honey bees are a high priority. It is important that we gain a full understanding of the precise details of the restrictions, their implications and proposed mechanisms by which the Member States, including the UK and its devolved administrations, will implement the proposed restrictions.

We are currently organising meetings with a number of key relevant organisations in order to better understand the ramifications of the recent vote and we will update our members in due course. We remain concerned about the impact of the restrictions on our honey bees. We expect the European Commission to ensure that Member States put measures in place which take into account the impact of these restrictions and any resultant changes in agricultural practice or use of pesticides and which must be proven to be safe for honey bees.

Dr David Aston, NDB,
Chair BBKA Trustees
2 May 2013

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One of the key messages coming from the 2013 Spring Convention was the importance of good bee nutrition. With the pressures on our colonies due to the 'extended' winter they have endured, there is further good news in that HiveAlive™ manufacturers Advance Science, have been working with the Irish Medicines Board and the Irish Department of Agriculture. They have confirmed that the product is 100% compliant with EU animal feed regulations on ingredient quality, traceability and manufacturing standards. This gives strong reassurance that HiveAlive meets high quality control standards, being safe for bees, strengthening hives with increased brood and honey production.

Tim Lovett, Public Relations Director

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Diary of Events

6–8 June. Royal Cornwall Show, Wadebridge. Schedules available from Sheila Sleeman, 01872 863842.

8 & 15 June. Kingston Beekeepers Fast Track Course for Beginners. Intensive two-day course covering practical aspects of beekeeping, £80. Details: www.kingstonbeekeepers.org.uk

21–26 July. Gormanston, Ireland. Details: Mary and Gerry Ryan 00353 62 71274; ryansfancy@gmail.com

6–8 September. Midlands and South West Counties Convention. Herefordshire BKA (host). Three Counties Hotel, Hereford. Lectures, workshops, Bishops Palace Garden visit and pollination lecture. Details and booking: www.mswcc.org.uk

24–26 October. National Honey Show, St George's College, Weybridge.

4–6 April 2014. BBKA Spring Convention at Harper Adams University.



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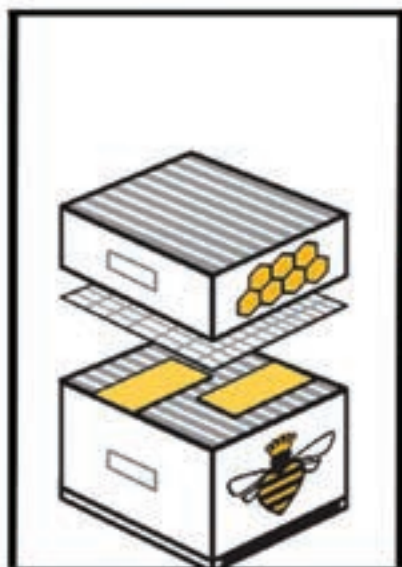
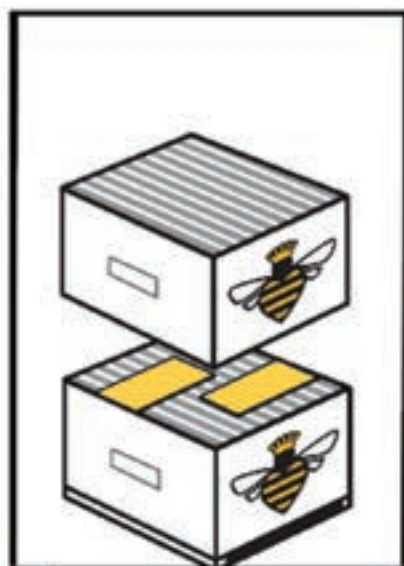
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