

In this Issue

Chairman's Letter	2
In the Apiary	2
Old Comb v New Comb	3/4, 6
A Brief History of Bees	5
The Forager	6
Pheromones - Part Four	7
Rearing Your Own Queens?	9
A Story of American Queens	10-11
Notes from a Clifftop Apiary	12
What is new at IBRA	13
Taking the Medicine - Part 6	14
Spring Convention	15
2010 BBKA Forum	16
Microbial Infections	17-18
Ask the Experts	18
News from the NBU	19
BBKA Strategic Review	20
ADM Propositions	21
New General Secretary	21
Examination Results	22/24/26
Book Review	23
Your Letters	25
Business Corner	27
Train the Trainers' Days	
Course in a Case	
Directory of Lecturers	
From the Boardroom	
BBKA News Announcement	28
Wax Chandlers Award	28
Diary of Events	28

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Asian Hornet is Getting Closer

In this article we describe the habits of the Asian Hornet, which has had a profound effect on beekeeping in those areas of France in which it has settled.

It is spreading northwards with no obvious hindrance to crossing the Channel and must be regarded as a potential threat, certainly in the warmer, more southerly, parts of the UK. However, this is about informing rather than frightening so part two in February 2011 BBKA News discusses ways of dealing with the threat.

Brief history of the Asian Hornet in France

The Asian Hornet (*Vespa velutina*) arrived in the area around Bordeaux, France in 2004/5, probably in a consignment of pottery from the Far East although some 'black hornets' were also reported in the vicinity of an ornamental plant seller in 2004. It has spread at the rate of about fifty miles each year since. Odd colonies were found around Paris in 2009: the predicted spread indicates a 50/50 likelihood of arrival in UK within five years. It has adapted easily to its new environment, colonies having been found in urban, sub-urban, agricultural and woodland settings. The spread is tracked at Inventaire National du Patrimoine Naturel <http://inpn.mnhn.fr> – using tracking methods not dissimilar to the UK BWARS group.

Identification

The sub-specie introduced to France is *V. velutina nigrithorax* which, as the name suggests, is the only hornet to have an almost entirely black/dark brown with only one orange band toward the rear of the abdomen (4th tergite). Another distinguishing feature is that the legs are yellow. At a little over an inch long it can be regarded as marginally larger than hornets found in the UK at the moment - about three times larger than a honey bee. It should not be confused with the much larger Asian Giant Hornet (*Vespa mandarinia*) which has featured in several recent TV programmes shown in the UK.

If you have access to the internet, then You Tube has some good films of Asian Hornets in action. For example <http://www.youtube.com/watch?v=RC98xvBO n1E> (Abeille : *Vespa velutina*, l'Attila des ruchers) – shows very well the typical hovering flight in front of a hive and also how a captured honey bee is treated.

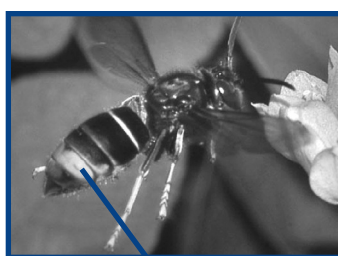
Life cycle

The most visible feature of the Asian hornet life cycle is the nest – usually built high up, often in trees or under eaves. Mated queens hibernate overwinter and will usually start an embryo nest in a secluded spot. Once sufficient workers have developed, relocation to the summer nest takes place. In its native far eastern habitat it is not unusual for colonies to grow to several thousand in number, with many new queens produced in early autumn. As the winter sets in and food becomes unavailable the colonies die out, leaving the queens to fly out and hibernate. Fortunately for honey bees, queen mortality over winter is very high.

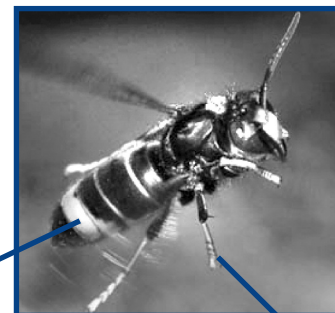
A honey bee predator

The Asian Hornet exhibits a very typical aggressive behaviour towards honey bees, which, both as adults and larvae, are a good

Continued on Page 5



Orange 4th tergite, otherwise black/brown



Yellow legs

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Chairman's Letter

I often hear that the BBKA does this or does not do that, which ignores the fact that BBKA Trustees are proposed by the membership and by and large probably reflect the changing views of that membership.

Over my time as a Trustee we have discussed many times BBKA's changing relationship with the Agro-chemicals industry and their changing relationship with the BBKA. Your current elected representatives have worked hard over the past months to seek a position that they feel they could support with regard to supporting bees and beekeepers as well as recognising that we live in a world which does not always see things the way we might like. I can report I am proud of the BBKA Executive in the way these issues have been addressed over the past months and believe at long last we have a position that deserves support from the membership at large. See article on page 20.

October brought the Members' Forum, the first I had attended and I have to report from my viewpoint it was very successful and informative. The contentious subject of pesticides did not damage the good humour in which the meeting was held and the resultant debate worthwhile, the two workshops allowed everyone to take part and the reported results on how to roll out training and ideas for research were well worth the effort. Thanks to all who came, and those who helped make the day a success.

The onset of autumn has meant that we have completed the work required to try and get our colonies through the winter and early spring. In Northumberland it is important to protect colonies from the north east wind and try and have hives in a position where they will receive sunlight on the shortest day. Mouseguards fitted, hives fed, extra ventilation put into the floors of some nucleus hives we are trying to overwinter, we now must just wait and see.

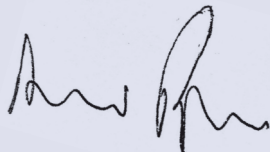
Thank you to all 1,386 members who completed the 2010 BBKA Honey Survey. The information will prove extremely useful when queries are received from the media, and we hope will help us give meaningful information to the public. Congratulations to Mrs R Bashford of Hereford BKA and Mr Hopper of East Sussex who won the £50 B&Q vouchers

In the year since I became Chairman of the BBKA I have seen no perks that go with the job, long hours, 600 mile round trips and nights away from home. However, you can imagine my pleasure and anticipation when I received the following e-mail - *I go to Kings Cross, but to be honest I don't know where is WH Smith on the concourse, so I will be waiting for you at the platform, where you arrive. I will wear a white coat with a black trousers and I have blond hair.*

This note was in response to a meeting that had arranged for me to be interviewed by the 'Lady in Waiting' to the elected Queen of the Honey from Hungary next time I visited London, I decided not to reply with my description of 'old man wearing blue anorak' but rather just arrive. It was a very pleasant occasion, being asked questions by a young and very pretty interrogator, the results of which will be seen in the next issue of the Hungarian equivalent of BBKA News.

It was interesting that in Hungary the Government policy is to try and grow as many businesses as possible and they pay subsidies to beekeepers dependant upon a points allocation based upon where they live; unfortunately our Government is unlikely to do the same.

BBKA members will be relieved to know that duty unfortunately forced me to drag myself away from this pleasant interlude for a meeting with a member of the BBKA Executive. As I stated there appear to be no perks with this job!



Brian Ripley, BBKA Chairman

In the Apiary



By now honey bees have settled down for the winter only being seen on those warm days when they leave the hive on cleansing flights. However there are items to be checked to ensure successful overwintering.

Autumn varroa treatments should have been completed so this is a good time to monitor levels in hives using varroa floors. It is best done over a fortnight, or longer, and if the mite drop is greater than two per day on average control is needed. The most effective treatment is to dribble a commercially prepared oxalic acid solution onto the bees in their winter cluster. This can be obtained from a bee supplies merchant, but if you must make your own recipes can be found in varroa literature and on the Internet. It is best done when there is little or no brood, during late December in my case, with the outside temperature at about 3° to 6°C. Remove the crown board carefully to reveal the winter cluster and then dribble 5ml of solution between each occupied bee way. This solution should be at room temperature, about 20°C, to prevent chilling of the bees. If you do not like the thought of using an acid then placing a single open tray of Apiguard on the top bars, during the winter period will be moderately successful, giving an efficacy of 60% or more. Remove the tray at least a month before supering to reduce honey contamination risks.

When applying these treatments it is a good idea to look between the frames and check the store levels. If the bee cluster is at the top of the frames it indicates a shortage of stores and emergency feeding using 'candy' is required. Some beekeepers heft hives to make a rough assessment of stores. Hefting is where one side of the hive is lifted and the weight gauged. If you have not done this before you need to heft an empty hive containing combs to get an idea of the weight to make comparisons. With a little experience you will quickly learn which hives need emergency winter-feeding. The more scientific weigh hives using a scale and calculate the amount of stores!

Now is the time to clean up stored equipment. During cold spells propolis and wax become very brittle making it easy to clean up super frames by scraping off the extraneous pieces of comb and propolis. The inside of wooden supers can also be scraped and lightly scorched off and I find that a light rub with a wire brush removes the propolis that rises to the surface after heating. Having clean supers will make hive management easier next year. Queen excluders need cleaning according to type. Wire ones can be scraped and wire brushed before lightly flaming with a blowlamp being careful not to melt the solder! Perforated and plastic excluders can be scrapped off and scrubbed clean in a washing soda solution. There are some very useful plastic trays available from Garden Centers that make ideal soaking pots. Plastics can be cleaned by scrubbing off using a washing soda solution and disinfected by using a solution of household bleach and washed clean in water.

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

Finally Christmas is coming so do not forget to drop hints about that much wanted piece of equipment or bee book.

Happy Christmas

Pinguis Imperium

Old Comb versus New Comb

Due to the rapid rise in colony collapse these past years, researchers from across the USA have been searching for answers.

Numerous samples have been collected from colonies in an attempt to isolate the cause. As of yet, there are no clear cut explanations for CCD, however information has surfaced which should cause concern for beekeepers: high levels of microbial and chemical contaminants detected in wax. Next month I will go into detail about these findings and the research we are conducting here at the bee lab but for this issue I would like to re-visit an older research project; Effects of comb age on honey bee colony growth, brood survivorship and adult mortality.

Several years ago I completed my Master's work here at the UGA bee lab. The subject of my research was the effects of old comb versus new comb on honey bee colony growth, brood survivorship and adult mortality. This paper was originally published in the *Journal of Apicultural Research* 40(1): 3-8 (2001). To read it in its entirety go to our website www.ent.uga.edu/bees and click on the research archives icon. Here is a shortened version of that research.

Honey bees use structures like trees and man-made hives for shelter, but it is the beeswax that provides the basic building material for the interior nest substrate. Adult worker bees secrete oval shaped wax scales from glands located on their abdomen and then modify these scales with mandibular gland secretions in order to construct the comb. Wax secretion usually occurs during peak foraging times because large quantities of honey or nectar must be consumed by the worker bees in order to produce these wax scales (Gary, 1992). The comb, made up of an array of hexagonal cells placed back to back, is the site where immatures are reared and food is stored. The comb also plays an important role in communication among the insects by providing the substrate on which dances are performed and chemical messages transferred (Winston, 1987).

When comb is first constructed it is pliable and nearly white in color but changes over time due to constant use and incoming resources. Comb used for food storage takes on a yellowish hue due to the accumulation of pollen (Free & Williams, 1974). As comb used for brood rearing ages, it becomes darker, almost black, and more brittle (Hepburn, 1998) because of accumulated fecal material (Jay, 1963), propolis and pollen (Free & Williams, 1974). The darker color may also be a result of numerous contaminants that are collected and absorbed in the wax over time.

Wax comb consists primarily of hydrocarbons and ester components with a small percentage of free acids and alcohols. These minor components are believed to give wax its plasticity (Tulloch, 1980) and ability to absorb many types of materials. Some of these materials include fungal and bacterial spores, pesticides and heavy metals which may be detrimental to a colony's welfare. Here is a list of some biotic and abiotic contaminants found in wax.

Biotic: American and European foulbrood spores, Chalkbrood spores, Nosema

Abiotic: Amitraz, Arsenic, Azoxystrobin, Boscalid, Bromopropylate, Captan, Carbaryl (Sevin), Chlordimeform, Chlordane, 2-chloroethanol, Chlorpyrifos, Chlorothalonil, Chromated copper arsenate, Copper naphthenate, Coumaphos (CheckMite+®), Diazinon, 4,4'-dibromobenzophenone, 1,4-dichlorobenzene, Dicofof, Endosulfan, Esfenvalerate, Ethion, Ethylene dibromide, Fenthion, Fluvalinate (Apistan™), Malathion, Menthol, Methomyl, Organochlorine (multi-residue), Organophosphorus (multi-residue), Methyl parathion (PennCap-M), P-dichlorobenzene, Pentachlorophenol, Phenkapton, Phenol, Phenothiazine, Polychlorinated biphenyls, 2,4,5-T, Tributyltin oxide (TBTO), Vinclozolin

As materials accumulated in wax comb, the diameter of cells becomes smaller (Winston, 1987). Each time a larva pupates, it spins a silken cocoon, parts of which remain in the cell after the adult emerges (Jay, 1963). Over time, the mass ratio of silk to wax increases, and thereby wax comb goes from a single-phase material to a fiber-reinforced two-phase composite product (Hepburn & Kurstjens, 1988). The bees, along with the cell size in old comb, are smaller. This is most likely due to the lack of space and a relative shortage of food.

Pheromones also are absorbed and transferred in the wax comb and,

depending on their volatility, may remain for a considerable time (Naumann et al. 1991). One pheromone group relevant in the current context is brood pheromones. These contact pheromones are emitted by brood and communicate to nurse bees the immatures' presence, age and nutritional needs (Free, 1987). Nurse bees, responsible for brood care, detect these pheromones more readily in older comb, and feed the brood more often. Therefore, larvae reared in comb with a previous history of brood rearing may receive somewhat better care with resultant higher survivorship (Free & Winder, 1983).

Prior to the presence of *Varroa destructor*, wild, temperate honey bee colonies were known to survive for about six years (Seeley, 1978). Once the colony died, wax moths, mice and other nest scavengers usually removed the wax comb, leaving an empty cavity for the next colony to inhabit (Gilliam & Taber, 1991). Modern beekeeping practices disrupt this natural recycling process by housing bees on semi-artificial comb that may be years or even decades old. Advances in beekeeping equipment, like the Langstroth hive and wire-reinforced foundation, have added years to the longevity of wax comb.

In the United Kingdom, beekeepers are encouraged to replace old combs as part of good husbandry practices (Brown, 1999). In the United States, Bonney (1990) recommends replacing two of the oldest combs each year to ensure that the hive body will not contain comb over five years old. Nowadays this may even be too old. Even so, many beekeepers believe that it is not economically feasible to regularly remove and replace old comb. Not only is the new foundation expensive and time consuming to replace, there is an energetic cost for the bees who must draw out the foundation into a functional comb using metabolically-derived beeswax. The typical nest contains around 100,000 cells (Seeley & Morse, 1976) which takes about 1,200 g of wax to construct. The

Continued on Page 4

Christmas

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amount of sugar required to secrete the wax is energetically equivalent to 7.5kg of honey, about one-third of the honey stores consumed by a colony over winter (Seeley, 1985). Therefore, beekeepers believe they lose money, time and honey yields by replacing old comb.

However, it is possible that the economic savings of using long-lasting comb may be offset by deleterious effects of old comb acting as a biological sink for toxins and pathogens or as a physical constraint on larval development. This question led me to investigate the effects of comb age on honey bee colony growth, brood survivorship and adult mortality for my graduate thesis.

In a three-year field study, we compared the quantity of brood produced, brood survivorship, average body weight of adult bees and population of adult bees in colonies housed on brood combs comprised of either old beeswax or newly drawn, first-year beeswax.

Outcome for this particular study resulted with colonies maintained on new comb having a significantly higher area of total brood, area of sealed brood and higher young bee weight. Comb age produced no statistically significant treatment effects in ending adult bee population or change in adult bee population; however, the trend was for higher ending bee populations in new comb and, correspondingly, a greater loss of bees in old comb. Brood survivorship was either unaffected by treatment or higher in the old comb class.

The increased brood production measured in the new comb may have been the result of several different events taking place inside the colony. It may have been due

to the survivorship of the brood, quality of brood care delivered by nurse bees, or the queen's egg production. Let us review the latter. Queens are able to distinguish between worker cells and drone cells by appraising the width of the cell with their forelegs (Koeniger, 1970). The cell diameter in old comb become smaller over time (Abdellatif, 1965); thus, an average reduction of cell diameter in old comb may have a negative effect on a queen's egg-laying productivity.

Older comb is also known to harbor numerous pesticide residues and diseases which may be detrimental to the brood's health. They are spread from colony to colony by tainted wax and materials brought into the hive. The queen may be sensitive to these contaminants and not lay eggs in particular cells. Also, the old comb may harbor brood pheromones (Free & Winder, 1983) that act as egg laying inhibitors to the queen because she perceives the cell to be already occupied.

Another phenomenon relevant to this study is the observation that bees prefer to store honey and pollen in cells that have been previously used for brood rearing. In the wild, as a colony grows and continues to add new comb, brood rearing gradually shifts into this new comb and the honey is stored in the old brood comb (Free & Williams, 1974). In unmanaged colonies this behavior may serve to avoid the negative effects of old comb on brood production. However, modern beekeeping practices inhibit this natural process by forcing bees to reuse old brood comb for brood rearing and to store honey in comb usually only used for honey storage.

Higher weight of emerging

young bees in new comb is best explained by differences between the average diameter of cells in the two comb age classes. As mentioned before, while brood comb ages, the diameter of the cells decreases due to accumulated cocoons and fecal material that are deposited by the larval and pupal instars developing within the cell (Jay, 1963). The body weight of a worker bee is mediated by genetics (Ruttner & Mackensen, 1952) as well as by environmental effects such as the amount of food fed to larvae (Daly & Morse, 1991; Fyfe, 1959) and the size of the natal cell (Jay, 1963; Abdellatif, 1965). Buchner (1955) determined that the mean weight of newly emerged bees from old comb in which 68 generations had emerged was about 19% smaller (96.1 mg) than the controls (118.3 mg). Morphological characteristics of European worker bees reared in smaller Africanized comb were smaller than those of European bees reared in the larger European comb (Rinderer et al., 1986). Daly & Morse (1991) found that larger worker bees could be reared from the large cells of drone comb. Glushkov (1958) discovered that bees reared in enlarged cells were heavier and larger resulting in more honey being produced by the colony and larger cells constructed. Worker larvae reared in enlarged cells received more food (21% more protein and 39.7% more glucose) than worker larvae reared in normal worker cells (Volojevich & Kulzhinskaya, 1953). The bulk of the evidence suggests that the weight of newly emerged bees is proportional to the volume of the cells in which they are reared (Nowakowski, 1969) and the amount of food fed to them by the nurse bees.

In this study bees reared in new comb weighed about 8.3% more than those reared in old comb, which is similar to Abdellatif's (1965) finding that worker bees reared in old comb in which 70 generations had been reared have an 8% reduction in body weight.

Lower bee populations in the old comb may result from an accumulation of foreign contaminants sequestered in the older comb causing higher mortality. Also, contaminants in the wax comb may mask hive signature and nestmate recognition cues, making it

difficult for foraging bees to return to their own colony. Some nestmate recognition cues are obtained from the wax comb (Breed & Stiller, 1992), and Breed et al. (1988a) discovered that colony odor acquired from wax comb can mask the genetic differences between bees. Colony odour is transferred to the adult bees by exposure to the comb substrate and can alter the recognition phenotype in as little as five minutes (Breed et al., 1988b).

Brood communicate to the worker bees their presence in the cell, caste, age and hunger levels through mechanical and chemical signals (Free, 1987). The chemical signals are the brood pheromones that may be the causative agent responsible for the increased survivorship found in old comb in this study. Wax comb acts as a reservoir for absorbing and transmitting pheromones which may explain why honey bee swarms are more attracted to older comb (Naumann et al., 1991). The presence of brood pheromones stimulates pollen foraging (Pankiw et al., 1998), enhances brood recognition (Le Conte et al., 1994) and stimulates nurse bees to feed larvae (Le Conte et al., 1995), all of which are important factors in brood survivorship. Free & Winder (1983) determined that brood survival was greater in cells which had been used previously for brood rearing than in comb cells never used before. Taken together these studies demonstrate that pheromones incorporated in wax comb may improve brood survivorship. The differences in brood survivorship noted in this study may be partly explained by more optimal concentrations of brood pheromones in older comb. In this study we found the seemingly paradoxical results of higher brood production in new comb but higher brood survivorship in old comb. We believe that this is best reconciled, internally and with the literature, by positing that the egg-laying rate of queens is highest in new comb, but once placed in a cell the chances of a larva's survival are best in old comb. Nevertheless, overall brood production is highest in new comb. Apparently the

Continued on Page 6

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A Brief History of Bees

Let us go back 135 million years to when the continents were clothed in tree-ferns, cycads, huge horsetails, and conifers.

This was the height of the reign of the dinosaurs. The air swarmed with primitive insects including oversized dragonflies and early butterflies. If we could travel to this ancient land, we might notice that there were no flowers; no orchids, buttercups or daisies, no foxgloves in the wooded glades. No matter how hard we listened, we would not hear the distinctive drone of bees. This was all about to change.

The early plants used wind to move pollen from flower to flower (as grasses still do today). Pollen is very nutritious, and soon some winged insects began to specialize in feeding upon it. Flying from plant to plant in search of their food, insects accidentally carried pollen grains upon their bodies, trapped amongst hairs or in joints

between segments. When, occasionally, a pollen grain fell off the insect onto the female parts of a flower, the flower became pollinated. And so insects became the first animal pollinators. A relationship had begun which was to change the appearance of the earth forever.

To start with, insects had to seek out brown or green flowers amongst the surrounding foliage. It was to the advantage of the plants to advertise the location of their flowers, so that they could be quickly found. So began the longest marketing campaign in history. Early water-lilies and magnolias were the first to evolve petals, conspicuously white against the forests of green. The first pollinators may have been beetles, and many water lilies still rely on them today. With this new reliable means of pollination, insect-pollinated plants became enormously successful and diversified. Flowers of different

plants vied with one another for the attention of the insects, evolving bright colours, patterns and elaborate shapes, and the land became clothed in flowers. In the battle to attract pollinators, some flowers began producing sugar-rich nectar as an extra reward. The opportunities for insects to specialize in feeding upon pollen and nectar grew, and the insects themselves diversified. Butterflies and some flies evolved long, tubular mouthparts with which to suck up nectar. The most specialized and successful group to emerge were the bees.

The first bees evolved from Sphecids wasps. These dig a burrow and stock it with the corpses or paralysed bodies of insects or spiders. At some point one of these wasps experimented with stocking its nest with pollen instead. Pollen is rich in protein, and so would have provided a nutritious alternative to their normal prey. When a wasp evolved to feed its young purely on pollen, essentially it had become the first bee.

We do not know for sure exactly how long ago this occurred, because insects almost never form fossils. Our knowledge is

based in part on insects that became trapped in amber (tree resin), but this must be a pretty rare event. Bees are pretty clever (as insects go), and are rarely so foolish as to get stuck in resin. The oldest known bee in amber is about 80 million years old. This was of a type of 'stingless bee', similar to species that live today in South America. These are advanced social bees that live in vast colonies, so it seems likely that the earliest bees appeared long before this. Studies of their DNA suggest that bees have been around for about 130 million years, probably very shortly after the first flowers evolved.

It is sobering to note that bees have been on this planet far, far longer than we have. They have seen the fall of the dinosaurs, the age of giant mammals, and now the age of man. Despite our best efforts to mess up the planet, I am sure that some of them will survive long, long after we are gone.

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The Asian Hornet is Getting Closer

...cont

source of nutrition for the growing hornet colony. Once a honey bee colony has been located, the hornet will hover outside and rarely land. It will target returning foragers, which by virtue of pollen or nectar loads are easier prey, and catch them in mid-flight. Once caught, the honey bee is then

dismembered and the body, in particular the thorax, pulped, before being taken to the hornet nest to be fed to larvae.

As with honey bees robbing, it is not unusual for many hornets to predate an individual hive. A consequence can be that the honey bee queen curtails egg laying, which, with the loss of forgers, can lead to a rapid reduction in colony strength.

Once the hive has been reduced in strength to the point where the hornets can enter the hive unchallenged the second stage of predation, which is removal of larvae begins. These too are used as food for the hornet colony.

Beekeepers have reported 50%-70% colony losses due to Asian Hornets in the early years of their presence in France, although as we shall see in the second part of this article, the fight-back by both bees and beekeepers is underway.

*David Bancalari,
Norfolk BKA and BBKA
Technical Committee*

Further Reading for you:

Biologist Magazine, May 2009 'A foreigner in France: the Asian hornet' by Dr Stephen Martin (University of

*Vespa Velutina nest in a Plane tree
The nest is built in spring. It is generally located in trees at several meters height. It is generally of spherical form and has a side entrance. It is abandoned during the winter. During this period, it has been observed in France that certain birds destroy the nest. This behaviour does not have any consequence on the sustainability of the species since the nest is empty.*

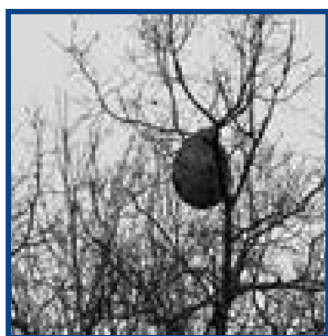


Figure 1 Asian Hornet nest about 40 feet up in Oak Tree



Figure 2 Asian Hornet nest under roof eave

The Forager

The right information at the right time!

During the first week in September I received a very welcome and very timely note from The National Bee Unit via e-mail. Timely because it dealt with preparing colonies for winter and, in particular, feeding and welcome as it confirmed that Beebase is now a fully interactive resource able to provide supportive information direct to the beekeeping community.

The advice on feeding was particularly timely as, on our return from a short break at the beginning of September, we found that some of our colonies were lighter than we would have liked them to be. The reason was simple; we have become accustomed in the last 10 or 15 years or so, along with many others, to seeing ivy in full blossom and in full flow quite by the end of August. Indeed for many beekeepers, ivy is the main winter stores source for their colonies. But, for whatever reason, it had not happened this year and, as I started writing in late September it was looking increasingly likely that the ivy would fail to flower and yield at all this year. Now, in late October, I can report that most, but not all, of the ivy in this area has made some contribution to the winter stores and even today (30 October) colonies were actively bringing home copious quantities of both nectar and pollen. It is the pollen which is so rewarding to see as it gives a reassurance that all is well, the queen is still laying and winter bees are still being produced.

I have often made a plea for beekeepers not to work by rote but to observe what is going on around them and this is a prime example. It would have been easy to have assumed that all preparations for winter had been made and to have assumed that the ivy flow would top up the stores. In fact, we had to purchase around 200kg of sugar and spent hours making up syrup to provide winter stores for our colonies. I do hope that others will have done the same (particularly with the timely advice from the NBU) otherwise losses due to starvation could be higher this winter.

Moving on to the e-mail from The National Bee Unit, what a welcome

development this is. I should perhaps explain that the e-mail was sent to all beekeepers who have registered on Beebase and have provided an e-mail address by which they can be contacted. Those whose details are in Beebase as a result of an inspection but who have not actually registered will not have received it. The advice given was not new but the fact that it was e-mailed directly to registered beekeepers at just the most pertinent time is.

The possibilities opened up by this development are endless – we hope to look forward to all manner of timely advice or suggestions together, possibly, with news of developments in the world of beekeeping. For many beekeepers, perhaps the most exciting prospect is the plan by the NBU to e-mail beekeepers within close proximity to identified disease situations, to advise them of actions they can take to minimise risk to their own colonies. Timely action as a result of this advice may help them to identify disease in their own colonies. Disease identified early will often minimise the impact on the colony and, more particularly can help limit the spread of the disease.

So, what can we conclude from this month's ramblings? Firstly, do not ever take your bees for granted. Always spend a little time observing and understanding how your bees are reacting to your actions and the environment that they are in, and never assume that what happened at a particular time one year will happen at that time (or even happen at all) the next. Secondly, sign up to Beebase to ensure that you are up to date with topical advice and news of developments in your own area. The advice from the NBU is always sound and is backed up by years of collective experience.

And whilst talking of advice, please allow me to offer a little. Now is the best time to be cleaning up all of your frames and equipment and preparing for next season. An early spring could catch you unprepared, particularly if you usually leave the purchase of your new foundation until the Spring Convention.

The Forager

Old Comb versus New Comb

...cont

benefits of maximized egg production exceed the benefits of maximized brood survival.

Over three years of field study, honey bee colonies housed on new comb had higher area of total brood, area of sealed brood, and weight of newly emerged bees. Brood survivorship was the only variable significantly higher in old comb. And finally, mortality of adult bee as affected by the age of comb in which they were reared or maintained was lowest in new comb but not significantly so. The bulk of the evidence suggests that new combs optimize overall honey bee colony health and reproduction. These findings suggest that beekeepers should eliminate very old brood combs from their operations.

Jennifer Berry, Georgia, USA
www.ent.uga.edu/bees

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Pheromones - Part Four

Queen introduction can be a problem because even after we take precautions such as caging the queen in a Butler cage, when she emerges the workers sometimes kill her.

This is particularly true if the strain of introduced queen is different from the strain of workers in the colony. It can also happen when the natural queen in the colony has not been removed, particularly when there are two queens in the colony (perfect supersedure)!! This begs the question of how do the workers differentiate between two queens and also why do the workers do this when the result could be destruction of the colony.

Firstly the workers only tolerate the queen laying eggs and having their own egg laying abilities suppressed because the queen's progeny is very closely related to them (super sisters) and she is able to produce workers to maintain the colony (they can only produce drones from unfertilised eggs). So, if an alien queen is introduced the worker will perceive that she cannot produce workers that are closely related to them and their genes are better preserved by producing drones that have the opportunity to mate with a virgin queen from another colony.

The alien queen is recognised through two aspects, namely her behaviour and her pheromones. An introduced queen will be nervous and behave unnaturally; hence the requirement to make the introduction slow so that she can start to beg for food and the workers can collect queen pheromone from her. This will relax her and the workers. However the queen's pheromones are not as simple as we initially believe. There are major components in both the Queen Mandibular Pheromone (QMP) and the Queen Retinue Pheromone (QRP) that are well known such as 9ODA, 9HDA, and Linolenic acid. In all there are nine major compounds and many more in low concentrations and the relative proportions change with the strain of queen AND to a lesser extent with the specific genetic makeup of a queen within a strain. In other words the pheromone balance of every queen is different and with the acute pheromone sense of the workers, they are able to differentiate between queens. The situation is further compounded by the general odour within the hive that eventually is expressed on every member of the colony.

What does this all mean? For a start it suggests that queen introduction needs to be done when the workers are desperate for a new queen, say within a week of the loss of their old queen(s). It is important to make the introduction gradual, particularly if the queen comes from a different source than the colony and to control the release of the queen if her strain is different to the strain of the colony. If the queen meets the workers in a free environment before she has been accepted then she may be stung, damaged or balled (or all three). The result could be a new dead queen or one that is so damaged that she is superseded soon afterwards. What happens is that a worker will take a dislike to the queen and arch its abdomen to release pheromones from its sting glands. This will encourage other workers to gather round the queen and start biting her wings and legs. She will in turn release pheromones from her sting chamber and possibly pipe. This will temporarily stop the balling but may not prevent it. The more the queen exhibits 'fear' by releasing pheromones, the more the workers will attack her and eventually kill her.

I know of a few cases where it has been necessary to delay the release of a queen from an introduction cage for up to two weeks. Even after this period, although the queen was not killed, she was superseded within a few weeks.

Ivor Davis, NDB

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Have You Thought About Rearing Your Own Queens

Some thoughts to consider before the 2011 season

Principles

Season: Like all living things, bees have the urge to reproduce and multiply. The urge is greatest when conditions are suitable in the usual swarming months of May, June and July.

Moral: This is the time of year to try.

Sex: The bees can raise a queen from any fertilised (female) egg.

Moral: Any young larva in a worker cell will do.

Age: The bees can raise a queen from any female larva provided it is not more than three days old.

Moral: Start with a very recently hatched larva.

Problem: They are both delicate and very small.

Cell Orientation: The orientation of the cell tells the bees how to feed a female larva - potential queens have vertical cells, worker cells are approximately horizontal. Whether queens lay eggs in queen cells or the workers transfer them there is not, I think, definitely known; I suspect the workers since they do just about everything except mate and lay eggs.

Moral: You have to provide a vertical cell.

Feeding: The differences between a queen and a worker are caused by a queen larva being fed more and more often and a diet much higher in sugar - this switches on particular hormones which cause the physical differences. Compared with workers queens have smaller brains, fewer eye facets, no pollen baskets, a curved barbless sting, a wider thorax and huge ovaries. After three days, worker and queen larvae begin to develop differently. After three days, even if then fed a queen's diet, a worker cannot then achieve a queen's physiology, although some unsatisfactory intermediate stage may be reached.

The food fed to all larvae varies from hour to hour; the nurse bees know what to feed by larval sex and age. The quality ingredient is royal jelly. This is produced in young workers' hypopharyngeal and mandibular glands. To produce royal jelly they need to eat plenty of pollen; as they age these glands atrophy. But they can be brought back into production, if not quite as good as before; useful if you make a hash of splitting a colony.

Moral 1: Provide plenty of young nurse bees - this usually means a double brood chamber; Brother Adam at Buckfast used double Dadants!

Moral 2: Provide plenty of food for them, particularly pollen but honey too; it is usual to feed sugar syrup.

Problem: Since feeding a strong colony is a good way to induce it to swarm, it is suggested that you use a colony that has been artificially swarmed and then re-united.

Excluding the queen: Once you have young larvae, most methods require a period of queenlessness for queen cell building. The presence of the queen in the same box usually means that the bees will either not turn your young larvae into queen cells, or if they start, they will then break them down.

Moral: For cell building, use either a queenless colony, or the top half of a double colony excluding the queen with a queen excluder.

Mating Nuclei: Once you have queen cells, you need somewhere safe for your new queens to emerge, mature (five days) and fly to mate. It is generally accepted that the smaller the colony, the faster the new queen mates. Apidea or Warnholz mini nucleus allow this.

Drones: Apart from the number of eggs and her laying pattern, queens are judged by their offspring. Obviously, half a female bee's genes come from their father. What will be the origin of the seven to seventeen drones that will mate with each of your beautiful new queens? Do you accept whatever flies by? Since drones have a gestation period of 24 days and take a further ten days to become sexually mature, if you are to control this and provide the drones too, you need to start first with them, and with lots of drone foundation, preferably in an isolated mating apiary, away from any casual dross drones. Since isolation is difficult, however, this is for the real experts. While I confess to just risking whatever flies by, I understand that, to minimise inbreeding, queens generally prefer to mate with drones from colonies two miles away so I have my mini nucs in a mating apiary at about that distance.

Methods

The Simplest: I quote from Donald Sims *Sixty Years with Bees*. 'Stimulate a selected colony wintered on a single box to build up rapidly in spring by feeding frequently and regularly, and to induce preparations for swarming by failing to provide room for colony development. Inspect for queen cells from time to time. When advanced queen cells are found, and just before the colony would otherwise swarm, make an artificial swarm by moving the colony away and providing a new box with foundation and one empty comb on the original site, into which the queen and the bees from two or three combs are brushed or shaken; they will be joined by the flying bees. It will pay to feed them. Three or four days later the original box can be split into nuclei, each with a queen cell, and some three weeks later each should have a young laying queen. Without drawing on other colonies for brood and stores, this method will probably not give more than four young queens as more nuclei cannot satisfactorily be made.'

Miller: This is a good and common way to produce a few queen cells. Sims quotes Miller, who wrote in 1912: 'Into an empty frame, two or three inches from each end, fasten a starter of foundation about two inches wide at the top and coming to a point within an inch or two of the bottom bar. Put it into the hive of your best queen. To avoid having it filled with drone comb, take out of the hive either for a few days or permanently, all but two combs of brood and put your empty frame between these two. In a week or so you will find this frame half filled with virgin comb containing young brood with an outer margin of eggs. Trim away with a sharp knife all the outer margin of eggs, except perhaps a very few eggs next to the youngest brood. Now put the prepared frame into the middle of a very strong colony from which the queen has been removed. In about ten days sealed queen cells are ready to be cut out and put wherever desired.'

Sims comments 'My own requirement is for about twenty queens a year and I always use the Miller method and rear two batches'. He adds 'The provision of mating nuclei is something of a problem' so he uses a variation which needs three colonies.

Punched cell: This is a good but less common way to produce a few queen cells. Take a hollow tube 9.5 mm in diameter, sharpen one end and punch out a cell with the smallest worker larva that you can see (never mind what is on the other side of the comb). Clip the tube into a frame from which the queen is excluded (eg. the upper half of a double brood box with a queen excluder below) so it hangs vertically and the bees will make a queen for you. Repeat to obtain however many cells you want. The details appear in <http://www.dave-cushman.net/bee/cellpunch.html>.

Jenter: (or Nicot Cupkit). See: <http://www.dave-cushman.net/bee/cellplugbox.html> This is a 5" square box of clear plastic queen excluder containing loose brown plastic cell cups. The box is fastened into a frame and, after 24 hours to acclimatise in the hive, the queen is put into it for a further 24 hours so she lays in the cells cups. These are then put into the upper half of a double brood box from which the queen is excluded. The bees draw them into queen cells which can be used like any other.

Grafting: This is the classic way the world over. It is quick, straightforward and simple. More on this next time.

Jeremy Quinlan, Master Beekeeper, Suffolk BKA

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A Story of American Queens

It is often said that 'USA commercial beekeepers' queens are the daughters of a limited number of mothers' and you may have wondered what impact this has had on US bees.

The statement is derived from research comparing gene and enzyme profiles of workers taken from US honey bee colonies in breeder-queen apiaries with feral colonies in the same geographical regions. The seminal paper, written in 1995, by Nathan Schiff and Walter Sheppard, is summarised here. Walter Sheppard is a member of the honey bee genome sequencing team that has now sequenced the entire honey bee genome.

Honey bees are endemic to Europe, Africa and the Middle East, but not the USA where the feral population has developed from introductions made primarily from Europe. By 1990 eight feral subspecies were established and descendants of a ninth subspecies (so-called Africanised bees), originally introduced into Brazil in 1957, entered the south US,

subsequently expanding their range northwards.

In 1993 it was estimated that there were around 3.2 million commercial honey bee colonies in the US. To ensure good egg production and colony vigour commercial colonies were actively maintained by replacing queens every year or two. Replacements were often purchased from breeders of queens that had been mated with drones derived primarily from colonies in a mating apiary. Because the US commercial colonies were headed by daughters of relatively few selected breeder queens it was thought they might have reduced genetic variability and, perhaps, vigour compared with feral colonies. The researchers sought to characterise honey bee strains and certain enzyme systems in workers taken from breeder queen apiaries to ascertain the nature of queens sold to replenish the commercial population.

Study design

An adult worker was taken from each of 185 colonies belonging to

22 queen-producing apiaries in east and west states of south USA. Of these, 142 were breeder-queen colonies and 43 were colonies headed by daughters of breeder queens. Using a combination of genetic and protein analyses the researchers examined worker bees for mitochondrial DNA (mtDNA) haplotypes (a haplotype is a set of closely linked DNA sequences, which are inherited as a unit) and allozyme variations. The findings were compared with previous findings from 692 feral colonies in southern USA.

Mitochondrial DNA: Readers will be familiar with nuclear deoxyribonucleic acid (DNA), which codes for cellular proteins. They may be less familiar, however, with mtDNA, which is found within mitochondrial cytoplasm and codes for proteins involved in mitochondrial function – i.e. the generation of cellular energy. At fertilisation of an egg with a sperm the resulting nuclear DNA contains genetic material from both parents, but mtDNA is

almost exclusively derived from the egg cell and is inherited down the female line.

Alleles: Geneticists have found that for some genes the DNA sequence can show subtle variations. These differing gene sequences are known as alleles and although they will produce slightly different forms of a protein these proteins will have identical functions. Enzymes coded for by different alleles are known as allozymes. Six such enzyme systems are known in the honey bee: malate dehydrogenase (MDH-1), phosphoglucosmutase (PGM), hexokinase (HK), aconitase (ACON-1), malic enzyme (ME) and esterase (EST-1).

The researchers identified the honey bee strains present in the breeder-queen colonies and the extent of representation of the various allozymes. These data were compared with data from feral populations.

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produce around 483,900 marketable queens (an average of 1,571 queens per breeder queen). This represents queen replacement for around sixth of the estimated 3.2 million commercial US colonies. The marketable queens included Italians, Caucasians, Carniolans, Buckfast, Midnight, and Starline strains.

Honey bee strain distribution

From mtDNA haplotype analysis the researchers estimated that queens sold from the breeder-queen apiaries comprised 3% *Apis mellifera mellifera* *iberica* Goetze and 97% *A. m. carnica* *ligustica*. This estimate assumed that all breeder queens within an apiary produced an equal proportion of the total queens sold. Commercial bee mtDNA haplotype distribution was significantly different from the local feral population where 36.7% were known to be *A. m. mellifera* *iberica* haplotype, and suggested restricted gene flow between feral and commercial populations. Similarly, *A. m. lamarkii* was previously found in 2% of feral colonies, but was not found in the sampled breeder-queen colonies. Swarming and open gene flow from commercial colonies since 1859 was thought to have explained the presence of *A. m. ligustica* in the feral population. The researchers found two additional *A. m. mellifera* haplotypes and 41 *A. m. carnica*/*A. m. ligustica* haplotypes in the breeder-queen daughter colonies.

Enzyme analysis

Of the six enzyme systems examined only MDH allozymes were detected in the commercial breeder-queen colonies, whereas

uncommon alleles for ME, EST 3, and PGM were previously detected in feral colonies. Interestingly, US commercial and feral honey bees had fewer alleles than reported in 23 *A. mellifera* colonies in Europe.

The frequency of finding the MDH allele in the commercial colonies was compared with that in feral colonies. One of the MDH alleles (MDH⁸⁰) is strongly associated with *A. m. mellifera* and was found at a higher frequency in feral compared with commercial colonies. This was unsurprising since this strain comprises a higher proportion of feral bees. However, comparative allele frequency analyses for these allozymes was confounded by a high variability of data both within and between research groups, partly reflecting methodological differences (and possibly partly reflecting bee strain differences geographically).

The researchers tested their samples for homogeneity by comparing subsamples from Georgia (35 colonies) and Texas (39 colonies) with the total commercial population. Neither subsample differed significantly from the total population. Despite finding extra *A. mellifera* haplotypes in the daughter colonies their MDH allele frequencies were not different from those of the breeder-queen colonies. In contrast, when the feral population was subdivided into states and compared with the whole feral population several subsamples were significantly different from the whole population.

Conclusions

Based on their findings of

differences in commercial and feral strain distributions and of greater heterogeneity in allozymes within the feral population, the researchers concluded that commercial bees were more homogeneous than feral bees. The authors suggested that feral colonies could be screened to ascertain whether they might offer potentially desirable traits that could be selected for and whether genetic differences between commercial and feral colonies might be exploited to improve bee breeding.

End note

This study represents a snapshot of the status in 142 breeder-queen colonies and 43 of their daughters' colonies in the early 1990s. The findings suggest the breeder population was tightly controlled with good homogeneity in the sold queens – at least in terms of the analyses conducted. Although the daughter colonies were apparently not different from the breeder-queen colonies and were potentially representative of a working hive 'in the field' these colonies were maintained within

breeder apiary conditions. The authors noted that queens are typically replenished regularly in the USA and that around sixth of the estimated (but not substantiated) 3.2 million colonies could be supplied annually by the apiaries studied, but no data were given to confirm the queen replenishment rate. Supersedures are not always detected and the extent to which working USA colonies were headed by such queens that had mated with feral drones – which would increase genetic variation – was also unknown. Nevertheless, screening studies could help understand which feral characteristics might benefit breeder-queen populations. Also, the impact of the spread of the Africanised bee and CCD on honey bee strain distribution and genetic profiles needs evaluating.

Summarised by

Dr Christine Knott, Surrey BKA

Reference

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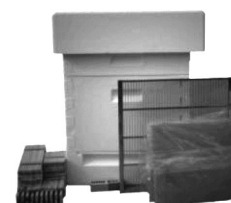
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Notes from a Clifftop Apiary

Through the gate, down the path, past all the other neat and well-tended allotments ... to the tangle of bramble and the waist-high grasses that hides the hives.

I am lucky to have this hidden corner plot. Behind it, beyond the blackthorn hedge and filling half the horizon is the sea; today it is calm and glittering and streaked with meandering tracks, like paths across a plain to the taut skyline. The moods of the sea.... The mood of the bee keeper ... The mood of the bees ... Life is infinitely variable. Today I am willing to open up the hive that has defensive bees to have yet another look for the queen, to mark her. It is not always so; some days I start the job, but after a few minutes I give up, put things back together and move off. Some days you just don't feel like doing it. Today turns out to be one of those days. I can't find the queen and the bees are irritated. I re-assemble the hive but keep the suit on to pick blackberries. It's been a very good year for blackberries. But the bees have been roused now and it's difficult.

Frank the allotment neighbour leans on his hoe and looks across at me. "Gardnin' in your bee suit ... must be hot?"

"Bees a bit cross," I call back.

"Well, you shouldn't rile 'em. Leave 'em alone to get on by their selves. That's what they biodynamicals do."

This is a revelation, Frank knows about Biodynamics? I'm tempted to take it up with him, but his back is bent and he is deep among the rhubarb.

It wouldn't be surprising if Frank does turn out to be sympathetic to the Biodynamic movement because he is a master vegetable grower. I doubt, though, if he sows by phases of the moon, stirs

his water butt with a cow's horn, or if he involves the cosmos in decisions about mixed plantings. He just has that touch, and he pays attention to detail.

In the field of bee-farming, having the touch, and going in for detail can mark you out as a certain kind of keeper. The Biodynamic folk tend to go for top bar hives, and favour minimal management. They also 'honour the sanctity of the swarm'. This might be fine if it was allied to up-to-the-minute knowledge of disease pathogens, viruses and current research in integrated pest management, but one reads little of this in the literature. Arguments persist over 'standard' bee keeping practice as encapsulated in the BBKA's examinations, and minimal management practices represented by believers in the Warre hive. But the end of the argument always comes to rest on this fact: your bee keeping practice is a reflection of you, your temperament, your sympathies, your capacity for detail and fine-tuning. Conclusion: if it works for you, that's the way you'll choose to do it. Go intensive bee-farming. Or let them build their own comb, add space from below, take a percentage of honey but leave enough not to have to feed for winter. Nobody is correct and nobody is wrong. Like politics and religion: your choices reflect you.

Me: I'm a convert to propolis. In the shed I fill up little phials and bottles and jars with it. This comes home with me.

I make it a regular practice these days to gather and keep propolis. It takes patience to scrape it off and collect it. You can do this by dropping the crumbs onto a white sheet, or into a plastic bowl. In its natural state propolis hardens to beads of crystalline resin. More

often, though, you'll come across it in the hive sticking everything down and making the whole living box tight and secure and draft-free. It's mixed with saliva and wax to make it pliable, so that the bees can mould it to fit gaps. Clearly, bees got around to grouting long before we ever thought of it. The biggest gap of all in their home is of course the hive's front door. To assist the guard bees, they will reduce the size of the entrance by using waxy pliable propolis to make a curtain or short wall of 'propwax'. (*Pro polis* means, in the forefront of the city.)

The marvellous thing about it, and what makes it so collectible, is its medicinal properties. If you suffer from a sore throat, try dissolving it in brandy and using it as a gargle. It has an anaesthetic effect; it's also antiseptic. Some people take it at the onset of a cold. Propolis taken from the hive is composed of balsams and resins, waxes, oils and pollen. Tree buds and barks secrete it to protect against moulds and infections. Bees use it to strengthen comb at the point of attachment, they polish cells with it, and they embalm dead intruders, like mice. Some people chew it. This is okay if you're staying at home, but don't do it if you're going out among ordinary human beings, and definitely not if you're going to a party, because you'll have bits of bright orange stuck in your gums, and people will freeze when you smile because your teeth will be bright yellow.

There has been a brief correspondence in these pages about breathing onto bees to make them scatter from tight clustering. You have to feel sorry for them. It's bad enough for you or me to have someone with bad breath talking into our face; how

much worse if you're a bee if a keeper with halitosis leans down and breathes on you. It's not funny. You'd scamper off that frame as fast as your little insect legs could carry you. The patron saint of bee keeping, St Ambrose, got the job because it is said that when he was in his cradle a swarm of bees settled on his mouth. Maybe he attracted them with his milky baby breath. There is no record of whether or not the other Father Figure of British bee keeping, Brother Adam, had sweet breath. Both were churchmen. Ambrose (340 to 397) was Bishop of Milan and Brother Adam was a German monk based at Buckfast Abbey. Maybe the breath of God passed through them. The Biodynamicals would approve of that.

It's Friday night and we are in the pub drinking to the memory of a deceased beekeeper. Sitting with us is the deceased's son, over from America for the funeral. Conversation is stilted. In the end I ask the son if he, like his father, ever kept bees.

There is a long pause; son tightens his mouth, squares his shoulders and looks away. "Naw," he says eventually. "Ah din' do that. See, ma Daddy ... he left big shoes." The company narrow their eyes and nod. "An' ma Daddy, he cast a long shadda." The company nod again and take a pull on their pints. Big shoes, and a long shadow. I get some more pints in. It's a long night. In the morning Wife gives me an odd look. I ask her what's the matter? She says, "When you got in last night you told me that when you die you're going to leave me your big pants, and all your records by the Shadows."

Rowland Molony
East Devon BKA

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What is New at the International Bee Research Association

The International Bee Research Association (IBRA) has now been providing the bee community with information services for more than sixty years, and has had to adapt and change to reflect the changing nature of both beekeeping and bee science, and in particular to embrace modern information technology. There have recently been a number of exciting developments that reflect its evolving role.

Firstly, and perhaps most obviously, has been a change of leadership. The role of Director of IBRA embraces many functions, and after much discussion following the retirement of Richard Jones, Director since 1996, in October 2009, the post was split into two roles. Sarah Jones now has the role of Executive Director, responsible for the day to day running of the organisation, and Norman Carreck is now Scientific Director, responsible for scientific and technical aspects. Tony Gruba remains as Finance Manager, and Jane Jones remains as Bookshop Manager. IBRA is a Registered Educational Charity (No: 209222) and also a non profit making Company (No: 463819), governed by a Council of members in both the UK and worldwide. The new Chairman of the IBRA Council is Hans Kjaersgaard (UK) whose introduction to IBRA was through internationally trading honey for many years.

The publishing of journals remains one of IBRA's core functions. The *Journal of Apicultural Research* (JAR), which will reach its 50th volume in 2011, publishes peer-reviewed papers including original research articles, original theoretical papers, notes, comments and authoritative reviews on scientific aspects of the biology, ecology, natural history and culture of all types of bees including honey bees, bumblebees, stingless bees and solitary bees. The Senior Editor is Norman Carreck (UK), assisted by Dr Adriana Alippi (Argentina), Dr Jay Evans (USA), Dr Fani Hatjina (Greece) and Sarah Jones (UK). From 2010 it became a solely online journal reflecting the changing nature of scientific publishing. Subscribers have access to all articles as they are published, and the extensive and

valuable back catalogue is gradually being scanned and becoming available online. Individual articles can also be purchased from the website.

From time to time, special issues of JAR are entirely devoted to particular topics of importance for beekeeping worldwide. For example, in 2008, Issue 47(3), edited by Dr Peter Neumann (Switzerland) and Dr Jamie Ellis (USA) covered the small hive beetle², whilst earlier this year, Issue 49(1), edited by Dr Peter Neumann (Switzerland) and Norman Carreck (UK) was devoted to the problem of worldwide honey bee colony losses³. This special issue is also available as a limited hard copy.

In 2009, JAR was joined by a sister journal. For a number of years, the editors of JAR had been receiving papers which dealt with aspects of hive products without actual reference to bees themselves, and these, no matter how good, were considered to fall outside the scope of the journal. In recent years, however, medical problems such as pathogen resistance to antibiotics have caused a renewed interest in the medicinal use of the products of the bee hive, long used in folklore and traditional medicine, allowing them to take their place among the modern armoury of drugs. Whilst many scientific studies have shown efficacy and safety, many other claims that have been made lack scientific credibility. As with any drug of biological origin, a thorough understanding of the mode of action, and the standardisation of concentration of the active ingredients, together with standardisation of testing methods, are essential. The fact that reports of the efficacy of hive products are often anecdotal, and have hitherto been published in a wide array of journals, books and ephemeral literature, has arguably slowed the acceptance of the use of hive products in 'conventional' medicine.

IBRA's new online journal, the *Journal of ApiProduct and Apimedical Science* thus provides a single forum for peer-reviewed reports of research on the six main hive products of both *Apis* and non *Apis* bees: honey, pollen, propolis, wax, royal jelly, and bee venom. Authoritative review

papers can also draw together the results of many studies, and provide a platform for the adoption of standardised techniques¹. It is edited by Prof. Rose Cooper (UK), assisted by Sarah Jones (UK), and with an Editorial Board in seven other countries.

These two scientific journals are mainly intended to serve the international academic community, but IBRA's third journal *Bee World* (BW), founded in 1919, but relaunched in 2010, is principally intended to serve the beekeeper worldwide. Edited by Richard Jones (UK), BW is free to IBRA members. BW provides easily accessible articles by authors around the world on all aspects of bees, beekeeping and bee science. Future articles planned include a regular series on plants for bees, and popular articles summarising scientific papers published in IBRA's other two journals.

From its early beginnings, IBRA has published books, ranging from small booklets, to major works which have stood the test of time. Two best selling IBRA books recently republished include William Kirk's 'A Colour Guide to Pollen Loads of the Honey Bee' (2006) and H A Dade's 'Anatomy and Dissection of the Honey Bee' (2009). The IBRA bookshop sells a large range of books on bees, beekeeping and bee science, as well as IBRA's own publications. It is well known at UK functions such as the BBKA Spring Convention at Stoneleigh and the National Honey Show, and also travels abroad to conferences such as Apimondia and EurBee. All items can also be purchased from the website.

As mentioned above, IBRA has been at the forefront of efforts to understand honey bee colony losses and the various explanations that have been proposed. It is an inescapable truth, however, that the parasitic mite *Varroa destructor* is present in all regions of the world where recent colony losses have occurred, and the mite is known to interact with other pests and diseases, principally viruses. Varroa

is, however, not a new problem. It was first identified as a serious pest more than half a century ago, and chemical and other control methods have been available for decades. Why therefore is it still a problem?

IBRA now proposes to address the continuing problem of varroa through an integrated project. This will consist of a major conference, to be held at the University of Worcester, UK, on 29 January 2011. This will be aimed at beekeepers and scientists, and the speakers will be international authorities, who will outline our current knowledge about the biology of the mite and its interaction with other diseases, discuss the problems of chemical resistance, and suggest control methods, whether chemical, biological, biotechnical or by bee breeding, and suggest practical solutions for the practical beekeeper to enable us to live with the mite in the 21st century. Full details of the conference and online booking facilities are on the website. The conference speakers will each contribute a chapter to a book, which will be launched at the BBKA Spring Convention at Stoneleigh in April 2011.

In its seventh decade, IBRA has thus adapted to a changing information world, and has many exciting future plans, but as a small independent charity and publisher, to continue its valuable work, it needs the continuing support of beekeepers worldwide. Membership of IBRA currently costs just £30 per annum. For more information visit www.ibra.org.uk

Norman Carreck, NDB

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The distribution and record keeping obligations for veterinary medicines

We previously discussed in part five of this series how veterinary medicines are evaluated for quality, safety and efficacy before they can be authorised in the UK. Now we will focus on the distribution of these medicines through retailers to farmers and animal keepers, and on their responsible use. We will also touch on the legal record keeping requirements for medicines for food producing species such as bees.

Once the scientific evaluation of a veterinary medicine comes to a satisfactory conclusion and the Veterinary Medicines Directorate's (VMD) scientific assessors approve its Summary of Product Characteristics (SPC). The SPC is a public document that contains information on the authorised use of the product which is determined by the quality, safety and efficacy data available for that medicine. The VMD has a database listing all the veterinary medicines that are authorised for use in the UK and an SPC is available for download for each product. The database can be used to search all authorised medicines for bees and can be accessed from VMD's home page (www.vmd.gov.uk).

The product literature, that is, the immediate label attached to the container, the outer box (carton) and the package leaflet, is also approved by the VMD and contains a summary of the information on the SPC. It is essential that you take the time to read the product literature that accompanies the veterinary medicinal product, and follow the instructions listed, before administering it to your bees. This will help to ensure safe, correct and legal use of the medicine. The VMD has published an article explaining the terminology used on product literature, which can be accessed from our web site here: <http://www.vmd.gov.uk/Publications/label.pdf>.

At the final stages of the approval process VMD scientific assessors also decide the distribution category of a veterinary medicinal product based on the possible risks that the product may present to the animal to be treated, to the person administering the product, to the environment and to the consumer, which is particularly relevant if the animal is a food producing animal. The product distribution category is stated in the product literature and determines whether or not it requires a prescription in order to be supplied and administered to an animal, who can prescribe it and through which outlets it can be retailed. In summary, distribution categories provide controls on the sale or supply of veterinary medicines to ensure that appropriate advice is given at the point of sale so that products can be used safely and effectively. A distribution category may be changed following assessment of an application by the Marketing Authorisation Holder, who submits safety and efficacy data in support of this change.

In deciding the distribution category of a veterinary medicinal product, assessors must follow European and National legislation. Medicines for food producing species may only be available on prescription (in the UK, either as POM-V or POM-VPS - see below) although European legislation does allow Member States to exempt a product for a food producing species from this requirement if it meets all criteria listed in the Directive. As we have seen in previous articles, bees are considered a minor food producing species in the EU and, therefore, veterinary medicinal products authorised for bees have to comply with the requirements of EU medicine legislation for food producing animals.

Currently the legal distribution categories for veterinary medicines in the UK are:

- **POM-V** (prescription only medicine – veterinarians): these medicines may be prescribed only by a veterinary surgeon and supplied by a veterinary surgeon or a pharmacist against a veterinary surgeon's prescription. Example: antibiotics and general anaesthetics.
- **POM-VPS** (prescription only medicine – veterinary surgeons, pharmacists and Suitably Qualified Persons): these medicines may be prescribed by a veterinary surgeon, a pharmacist or a Suitably Qualified

Person and supplied by these professionals. A Suitably Qualified Person (SQP) is a person who is trained and registered with a body approved by the Secretary of State (currently AMTRA) to prescribe and supply certain types of veterinary medicines. Example: some cattle parasiticides.

- **NFA-VPS** (non-food animal - veterinary surgeons, pharmacists and Suitably Qualified Persons): the supply of these medicines does not require a prescription but advice must be given at the point of sale to ensure that the product can be used correctly and the most suitable medicine is chosen for the animal. NFA-VPS medicines may be supplied by a veterinary surgeon, a pharmacist or a Suitably Qualified Person. Example: some dog wormers.
- **AVM-GSL** (authorised veterinary medicine - general sales list): no prescription is required for these products, which may be supplied by any retailers, including supermarkets (aka 'over the counter' medicines). Example: some flea shampoos for dogs

Once purchased, all medicines should be stored securely and in accordance with the instructions on the product literature. Medicines should be kept out of reach of children and animals, and disposed of in accordance with the instructions on the product literature.

Beekeepers need to be aware that, in accordance with the EU and national legislation, veterinary medicines records

must be kept for food producing animals, including bees. This means that the owner or keeper of food-producing animals is responsible for keeping proof of purchase of all veterinary medicines acquired for those animals. The following must also be recorded at the time of purchase: name of the product; batch number; date of purchase; quantity purchased and name and address of the supplier.

Once the product is administered to bee colonies the following should be recorded: name of product, date of administration; quantity administered; withdrawal period; and identification of the colonies treated.

There are also requirements regarding disposal of veterinary medicines for food producing animals. So, if the product is disposed of, other than by treating an animal, the following must be recorded: the date of disposal; the quantity of product involved; and how and where it was disposed of. All records and proof of purchase must be kept for at least five years following the administration or disposal of the product.

Record keeping is necessary to ensure traceability of medicines and to enable product recall, particularly for medicines used to treat animals entering the food chain. However, the VMD considers that the extent of the record keeping requirements in the current legislation is too prescriptive and, in some areas, excessive. We have asked the European Commission to reconsider the extent of the records required to be kept in accordance with EU legislation and have proposed to retain only those necessary for consumer safety and, on a proportionate basis, for animal safety. We hope that the forthcoming review of the legislation on veterinary medicines will take this point into consideration.

Martha Spagnuolo-Weaver, VMD and Tim Lovett, BBKA

Medicines Record Card

Name of product			
Batch No:	Date Purchased	Quantity	Supplier
Colony No:	Date Administered	Quantity	Withdrawal Period



Spring 2011 Convention

Stoneleigh Park, Warwickshire CV8 2LG

Spring Convention News

Lectures & Workshops

The schedule of lectures is now finalised and covers a wide range of subjects aimed at all levels of experience. Keith Delaplane, Ingemar Fries and Mario Pahl (Jürgen Tautz's right hand man) make up the international contingent. Subjects range from honey bee decline through noseema and viruses to the honey bee as a super organism. With fifteen lectures on Saturday alone there will be plenty to choose from.

The workshop schedule is as usual eclectic, with the ever popular microscopy workshop augmented by a second session on honey bee anatomy. Aspects of husbandry, hive building, hive products, gardening, cooking, encaustic art and the popular patchwork event are all included. Then there is a series of workshops covering the basic assessment, general and advanced husbandry plus the ever popular NBU disease recognition day. The queen rearing event will be at the heart of the convention again.

Consult the web-site for more details and how to book or contact the workshop convener Ruth Homer: 01308 482483

Tickets

Entry is by wrist-band; prices now include a programme and postage. Sales commence by post or via the web on 4 January 2011. Go either to the website or send a letter stating membership numbers and names for each wrist band plus a C5 (9"X6") self addressed envelope and cheque payable to BBKA to: Christine Hayward, 19 Kings Road, Leiston, IP16 4DA. Tel: 01728 832487 or e-mail: violinchristine@suffolkonline.net

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2010 BBKA Forum

The BBKA Forum 2010 was held on a gloriously sunny Saturday 2 October.

Around sixty people attended, representing twenty-eight Associations and the Executive Committee. All were warmly welcomed by Chairman, Brian Ripley. On the agenda were 2 workshop sessions to consider Education and Research, and specific issues raised by Associations. In addition, an electronic voting system was trialled in preparation for the ADM.

Education: The first workshop was introduced by Chris Deaves who gave an update on the Education project. He explained the nature of BBKA's re-engagement with FERA which has resulted in receipt of 50% of funds for the project which includes production of Course in a Case (CiC); working in association with NDB for short courses; and training beekeepers in the form of an intensive programme to train four hundred beekeepers to train others. He said it was excellent news that BBKA is working with the Government so productively, which was met with approval from the members present.

During his presentation of 'education programme headlines', Chris indicated the difference between the roles of the Education Programme and that of the Exam Board, which led to discussion about the fitness for purpose of the Husbandry exams, and an address from Tom Salter on behalf of the Exam Board. It is recognised that local associations are struggling to deal with new membership numbers and delivery of basic training, let alone moving people on; that there is an increasing lag between coming in and then building the next generation of trainers.

The CiC is intended to be a detailed tool for a tutor, not to be followed rigidly, but with an aim to improve husbandry standards resulting in healthier bees in a way which is mindful of the possibility that voluntary tutors may be unwilling to participate if training is too formalised. The workshop groups discussed how to introduce CiCs to local beekeepers, resulting in useful feedback including:

- Maintaining a drip-drip approach to encouraging members to attend events that use a variety of imaginative methods,
- Communicating in an encouraging style with a positive message to improve the health of honey bees,
- Taking care not to exclude older, established beekeepers, perhaps via respected fellow beekeepers, especially given the influx of new members who are swelling meetings,
- Keeping training local enough to encourage attendance, and explore inter-association training e.g. different associations taking responsibility for different parts of the syllabus within one geographic area,
- Making sure honey bees are handled as well as watching others,
- Introducing a buddy system for new beekeepers and
- Investing in truly interested newcomers by introducing them to the realities of beekeeping in an open meeting before accepting candidates onto a course.

Research: The second workshop was based around David Aston's request that the Forum starts a process of determining the research work that the membership feels BBKA should be supporting, taking into account the activities of the Insect Pollinator Initiative, and an imminent programme to be funded by EU monies. BBKA's research pot is modest but is already funding projects pertinent to beekeepers in the UK. As such, BBKA is seen as an industry sponsor and the 'Concepts' document is still a reference point for research needs. David posited a need for information that is timely and pertinent to UK beekeeping and posed some specific questions.

The feedback was clear in a preference for applied research to further the craft of beekeeping with projects considered on a case-by-case basis, but to be related to BBKA policies and objectives, possibly in partnerships with other BKAs. The view was that capitation increases should only to be requested to fund specific projects as opposed to paying into a generic research pot, and that there needed to be a more positive attitude toward donations for research purposes.

Overwhelmingly, there was an expression that we have enough expertise within our community to perform projects with outcomes that can be published as worthy evidence, and therefore to consider as priority, projects that can utilise this resource. There is particular capability to perform seasonal projects and publish results that have an immediate impact. There could be a role for BBKA to fulfil co-ordination, design, collation and analysis of such work, or indeed fund a research officer to undertake it.

Specific ideas were identified. Most topical was that of dealing with our old adversary the varroa mite and its lifestyle, the most imaginative being the application of contraceptives which led to an inevitable and collective laugh given the size of the mite! It was desirable for the membership to be asked for their view on what is required to assist their husbandry and to perhaps set up a research based forum using the knowledge within the membership to come up with ideas. More broadly, there was a plea to tie in with our European counterparts to avoid double researching. Also, it was suggested that wax users, such as the cosmetics industry, be approached to contribute to research into wax residues.

Crop Protection: Moving on to the agenda items requested by Associations, there was a strongly worded request from one Association to pursue the vexed question of BBKA's involvement with agri-chemical companies, and although the proponents were subsequently unable to attend to speak to it, a mature debate ensued. At one end was a plea for BBKA to be 'squeaky clean' as the 'great umbrella organisation for beekeeping' because there is much concern for the environment and the effect of chemicals on it: at the other, a reminder that farmers have responded by using products we would prefer them to use, and that we are using fluralanate in our hives, suggesting that the matter be viewed in a broader context.

Clarification was sought on the current state of play. Martin Smith explained the position remains broadly unchanged; still four products and same money, but with no plans to expand the current policy which will gradually fade away. He indicated that the Executive Committee recognises the large minority against such engagement, but the need to balance this with the majority who, over the last two years, has voted for engagement and paid endorsement of specific products.

Spring Convention: Tim Lovett explained the difficulties in accommodating the Spring Convention at any venue. The tension arises from hosting a joint event which is part trade show (that is heavily trafficked), and part educational, which together make 'an incompatible marriage'. The discussion concluded by acknowledging the Convention is enabled by volunteers who do their best to make the event fit for purpose; without them there would not be a Convention and tolerance is requested at the compromises that have to be made. You may care to note that 31 March 2011 will be a deadline for advance tickets.

Bee-friendly trees: Based on historic foresight of a local authority, one Association is now reaping the rewards of bee-friendly trees being planted many years ago. The request was to find ways of encouraging local authorities to incorporate more bee-friendly trees in planting schemes, particularly to get them specified alongside the narrow native tree list currently used, by lobbying both planning authorities and major developers. It was felt it would be helpful to publish and share local successes; also, for BBKA to consider influencing at a strategic level.

And so the Forum came to a close. Brian highlighted the complexities of creating a sustainable income source outside the capitation fees, and made a plea to differentiate any adopt schemes outside BBKA's 'Adopt-a-Behive'. He summarised the day as one with excellent, active participation and positive contributions to which the floor warmly responded. Useful ideas had been identified and the results of the day's consultation, which is underpinned by the strength and value of local membership, will further strengthen BBKA's position with FERA. The Forum also provided the very important opportunity for participants to talk and share informally with colleagues from all over the UK.

Dawn Girling, BBKA Executive

BBKA News - December 2010

Microbial Infections of Bees and Brood

Disinfectants and sterilants

There are numerous infections to which bees are susceptible, some more important and serious than others.

Generally, in spite of the high population and close proximity of the bees to one another and brood, colonies of bees remain remarkably healthy. Propolis has natural antiseptic properties and honey itself contains hydrogen peroxide which is antiseptic. Nevertheless, there is a range of different types of pathogens that can attack bees and sometimes succeed in causing disease, especially if the colony is weak and the bees are not well fed.

Microbes fall into several groups; viruses, bacteria, fungi and protozoa. The type of treatment for the various organisms depends on whether one is attempting to cure an infection in another living species or whether one is treating equipment, tools, surfaces etc. Disinfectant agents used for treating surfaces and tools are frequently quite severe and may be corrosive or toxic and thus unsuitable for treating bees. Heat and powerful chemicals are generally used for this purpose whereas antibiotics are commonly used safe agents for treating infections in a live host.

All antimicrobial agents are affected by the size of the inoculum, in other words by the number of the organisms present in or on the sample/surface to be treated. Small numbers will always be easier to disinfect, very large numbers can be more problematic. Another important factor is the presence of gross amounts of biological material, such as faeces, as this can interfere with the action of the agent. Cleaning, where appropriate, can therefore improve the efficacy of any treatment.

Viruses.

Viruses are often very specific, infecting a narrow range of hosts. They are particles with a protein shell and have the ability to invade animal or plant cells; but they are not living cells. They cannot multiply outside a host cell and some are unable to survive for long without a host cell although

they can be carried and protected on material such as tissues, faeces or manure. Once they have invaded a cell they then transform that host cell; this host cell then produces large numbers of viral particles. These may then cause the cell to disintegrate, releasing the particles which can then infect more cells.

Unfortunately as they live inside a host cell, they can be difficult to eradicate. Currently, there are no cures for any viral infections of bees or of varroa mites. There are, however, agents that will kill viruses on equipment and on infected material. One commonly in use is Virkon.

Bacteria

Bacteria are single celled organisms with a cell wall. Most common bacteria can live and multiply in the environment and some can also invade animal cells (pathogens) and produce infection. Species that cannot live and multiply outside a host in the environment are termed obligate pathogens (for example, tuberculosis and leprosy). The common species of bacteria are either round (cocci) or rod shaped (bacilli). They are divided by a staining technique into Gram-positive or Gram-negative. Examples of human pathogens are

- Gram-negative rods - *Salmonella* and *E. coli*
- Gram-negative cocci - the gonococcus and meningococcus.
- Gram-positive cocci - Staphylococci and pneumococci
- Gram-positive rods - tetanus, anthrax, *Clostridium difficile*.

Some Gram-positive rods or bacilli have the ability under suitable conditions, to produce spores. These are round structures with a thick, resistant wall. These spores are commonly produced as a survival mechanism under adverse environmental conditions, extreme heat or cold or lack of nutrition, and are the most resistant forms of microbes known. The normal rod-shaped bacteria is termed the vegetative stage and this is susceptible to a wide range of agents. In contrast spores are resistant to heat, to many antibacterial agents and

chemicals. Anthrax spores have been shown to survive for decades in soil and still retain viability, germinating and producing infection in animals and man when the conditions are suitable.

The most important bacterial diseases in bees are European foul brood (EFB), caused by a Gram-negative coccus, *Melissococcus plutonius* and American foul brood (AFB), caused by *Paenibacillus larvae var larvae*. Both are notifiable diseases. The EFB organism is not difficult to eradicate in or on equipment as it is susceptible to most disinfectant procedures. In contrast, the organism producing AFB is a sporulating Gram-positive bacillus and the spores produced during an infection are consequently extremely resistant. The UK policy of destroying colonies with AFB will remove much of the infected material but boxes, hive tools etc will need careful handling.

Fungi

Fungi are more complex organisms than bacteria and most have a complex life cycle which sometime includes different types of spores and growth stages. The main or vegetative form of growth is formed of long branched filaments called a mycelium. Spores are produced on various types of branches from these filaments. It should be emphasised that fungal spores are not particularly resistant. Most fungal species produce huge numbers of spores purely as a method of dispersal (many are wind-borne) not for survival under adverse conditions. There are numerous common species in the

environment, most of which are rarely pathogenic.

Chalk brood is a common fungal infection of bees and characteristically produces large numbers of spores, these can contaminate the brood combs and perpetuate the infection. The causative organism is *Ascosphaera apis*.

Stone brood is an uncommon infection caused by fungi and is similar to chalk brood. The causative organism is *Aspergillus flavus* (yellow green) or *Aspergillus fumigatus* (Grey-green). These are also profuse spore producers.

Nosema apis and *N. ceranae* belong to an unusual group of fungi called Microsporidia. These were formerly classified as protozoa but are now believed to be more closely related to fungi. Like other fungi, spores are produced by *Nosema spp.* in large numbers but these are not very resistant and are susceptible to many disinfectant agents. They may survive in faecal contents on combs, frames and boxes for many months but are not difficult to remove.

All of these fungi can contaminate the combs with large numbers of spores but these spores are susceptible to a number of commonly used disinfectants. Tools can be cleaned and decontaminated with soda solution, combs removed and treated with acetic acid or sulphur and boxes washed and flamed.

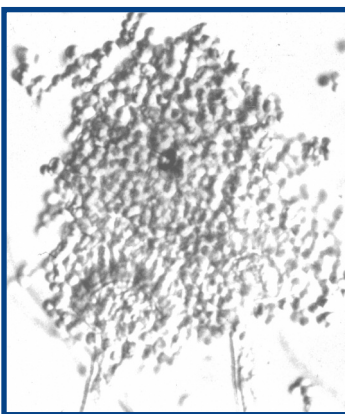
Protozoa

Protozoa are microscopic single celled animals many of which can have a complex life cycle with different forms. Many are pathogens of a range of animal species and include malaria and sleeping sickness. Most protozoa, like fungi, are also susceptible to a range of common disinfectants.

Although some protozoa can be found in bees, the only commonly known protozoan pathogen of bees is *Malpighamoeba mellificae* which infects the malpighian tubules. The organism occurs as cysts, flagellated amoebae and trophic amoebae. The cysts are excreted via the rectum and probably contaminate the combs.

Continued on Page 18

Aspergillus flavus head showing numerous spores



Ask The Experts

This month the questions posed are about the use of Fumidil B and Pam Hunter has been asked to explain.

We have been using Fumidil B in our hives for decades so why has nosema not developed resistance? Is it because it is not a bacteria? Might it be encourage resistance amongst bacteria in the general environment?'

Fumagillin (Fumidil B) is an antibiotic belonging to a class of antifungal and antiprotozoal antibiotics known as polyenes. It is produced by the fungus *Aspergillus fumigatus*. Fumagillin was first discovered in 1951, the start of the golden era of the hunt for natural products with activity against pathogenic organisms. A related polyene compound, amphotericin B, has been used for serious, systemic, human fungal infections for nearly six decades and there are still no clear indications that any pathogenic fungus has been able to develop resistance to it. Although it is not as easy to test *Nosema* in the same way that a human pathogenic fungus is tested, it seems that *Nosema* is still susceptible to fumagillin after many years of use.

To explain why, one needs to understand how pathogenic organisms become resistant. Some are just naturally not susceptible (this is termed **intrinsic resistance**) while other pathogens become resistant following prolonged exposure to the compound/drug (**acquired resistance**). Pathogens have a variety of ways of avoiding the lethal action of compounds or becoming resistant, the commonest of which are;

- Changing the structure of their cell wall (if they have one) to exclude the passage of the drug,
- Turning on a pump which exports the drug rapidly if it does gain entry,
- Developing enzymes which inactivate or destroy the drug before it reaches its target,
- Changing the structure of the site at which the drug has an effect.

All of these can result in the pathogen acquiring resistance to the drug,

sometimes very quickly, sometimes slowly. These resistance mechanisms are generally developed against compounds with a single mode of action or target. If a drug has more than one mode of action or target against a particular pathogen, then it is far more difficult for the pathogen to defend itself.

Polyenes such as fumagillin, attack the membrane of fungi and protozoa but have several ways of doing this making it seemingly impossible for the organism to avoid the adverse effects. The compound binds to an extremely complex molecule, a sterol (ergosterol) and changes its conformation so that the membrane gradually loses function. It also affects the potassium channels in the membrane, resulting in massive efflux of potassium and to a lesser effect sodium, both of which damage the integrity of the membrane. There are other less well understood effects also, making these compounds highly effective.

Animal cells, both bees and humans, also have membranes which contain sterols but the sterol is cholesterol to which the polyenes bind less well. This provides some protection from the action of the polyene and gives a safety margin.

What about bacteria?

Bacteria are structurally very different from animal cells and from fungal cells. Their membranes do not contain any ergosterol and thus lack the main target. This makes them naturally or intrinsically resistant to polyenes whose action is restricted to fungi and to protozoa. In addition, bacteria have a complex cell wall; this itself acts as a barrier to compounds with a large complex structure such as polyenes which are unable to cross the cell wall.

*Pam Hunter, Fellow of the Society of Biology, FLS
Central Sussex, Master Beekeeper*



Microbial Infections of Bees and Brood

...cont

Common disinfectants

There is no perfect answer to disinfecting all beekeeping equipment as an agent that is good for cleaning hive tools may not be suitable for boots, hive parts or frames. A variety is needed

Irradiation will kill all pathogens but requires specialist techniques and equipment. Similarly heat (boiling water, blow torch or steam) is an excellent disinfectant but this is often not suitable for all conditions. Bacterial spores, including those of AFB, need prolonged exposure to heat or steam. Hot soapy water can be useful for some equipment as soap can destroy the outer membrane of many organisms making them more susceptible to the heat or to subsequent disinfectants.

A number of commercial agents are available and they have usually been tested thoroughly against a range of organisms since many are for use in the food industry, agriculture or in hospitals. Testing generally includes a range of different types of microbes: a Gram-negative bacillus (e.g. *Escherichia coli*), a non-sporulating Gram-positive coccus (e.g. *Staphylococcus*), a sporulating Gram-positive bacillus (e.g. *Bacillus subtilis* and *Clostridium difficile*), fungi (e.g. *Candida albicans* and *Aspergillus niger*) and viruses (e.g. influenza and herpes).

Different concentrations are used and different exposure times. Different inocula of the pathogen are used. Varying temperatures are often included and the rate of kill determined under these varying conditions.

Virkon is an antiviral agent and has been used to help control foot and mouth outbreaks but it is substantially less effective as an antibacterial and has no practical value for bacterial spores (AFB) since high temperatures and prolonged exposure are needed. It is also damaging to skin and thus care has to be taken with its use. Its use in beekeeping seems to be of little value since there is little evidence that viruses contaminate equipment.

Salviox is an excellent sporicidal agent with a wide spectrum of activity including bacteria, fungi and viruses. It is based on a stabilised form of hypochlorous acid which is not harmful to the human skin. It is widely used in the hospital environment and is recommended as a hand wash (unlike Virkon). There is good information published on the kill rates against various organisms including bacterial spores.

Other disinfectants commonly used

Hypochlorite (or bleach) and hydrogen peroxide. Traditional disinfectants but the amount of hypochlorite needed to have a useful effect is difficult to achieve with the types sold over the counter (e.g. as household

bleach). Suitable preparations of hydrogen peroxide are not readily available.

Washing soda solution is extremely effective for many beekeeping tasks, especially cleaning and disinfecting hive tools. It has the bonus of dissolving propolis but is damaging to the skin. It can also be heated in suitable containers and used to clean and disinfect frames and ends.

Acetic acid (80% solution) is an excellent agent for disinfecting combs and boxes by fumigation; it is highly effective against a range of pathogens that may be found in the combs. It is toxic and care has to be taken to avoid inhaling the fumes or getting it on the skin. Combs, including those containing honey, can be returned to the hive once the fumes have dissipated.

Unfortunately systematic tests on such agents have not been carried out as these are normally done by commercial organisations with a view to selling a product to industry or to the health service. It is highly likely that both acetic acid and strong soda solution would be effective against EFB and AFB at the levels that would be present on equipment. No tests appear to have been carried out but this might be a fruitful area for research.

*Pam Hunter
Fellow of the Society of Biology, FLS
Central Sussex, Master Beekeeper*

News from the National Bee Unit

Introduction

The National Bee Unit (NBU) is comprised of almost eighty full and part time personnel who, together with many other colleagues at the Food and Environment Research Agency (Fera), work to provide an integrated honey bee health programme.

Our responsibilities include apiary inspections, pest and disease diagnostics, research and development (R&D), training and extension, contingency planning and surveillance, consumer and environmental protection and commercial services. This short article gives a brief outline of just a few of our activities, to hopefully provide readers with a flavour of the range of tasks undertaken by the team.

The NBU Apiaries

The NBU runs 180 honey bee colonies in ten different apiaries around Ryedale district, North Yorkshire. All aspects of apiary management are overseen by Commercial and Diagnostics manager, Selwyn Wilkins, who has over twenty years beekeeping experience. Although our colonies are very productive (yielding an average of 40kg honey per hive), this is not their primary function; first and foremost they are an essential educational and research resource, and without them we would not be able to fulfil many of our annual objectives. We use double brood Smith hives, because these support the large colonies needed to supply sufficient bees for the NBU's demanding and varied R&D portfolio. We are, for example, looking at the long-term impacts of the microsporidian pathogens *Nosema* spp., so maintain an apiary that is never treated for Nosemosis. Apiary staff collect adult bees from these colonies to screen them for both types of *Nosema* present in the UK (*N. apis* and *N. ceranae*). Worker bees are harvested in groups of sixty, and analysed by the scientists in Fera's highly specialised Molecular Technology Unit (MTU). In support of our ongoing training programme, we regularly host Contingency Planning exercises for Appointed Bee Inspectors, and the apiaries are used to practice vital inspection techniques used to monitor for exotic threats such as the Small Hive Beetle (SHB) and *Tropilaelaps* mites. In July 2010 we hosted the National Diploma in Beekeeping Course (NDB) Advanced Husbandry Course, which also took full advantage of access to NBU colonies. We have helped the NDB run this course annually, for the last thirteen years. This type of training is something that we particularly enjoy, because it provides valuable opportunities to meet and get to know UK beekeepers.

Pest and Disease Diagnostics

Diagnoses of suspect honey bee samples are overseen by Laboratory Manager Benjamin Jones. We use a combination of classical microscopy in the NBU's dedicated laboratory, and state-of-the-art molecular techniques in Fera's MTU. Statutory diagnosis for European foul brood (EFB), American foul brood (AFB), exotic pests and screening of honey bee imports from outside the EU are undertaken at no cost to the beekeeper. In addition to free

statutory diagnostics, we offer a chargeable adult bee disease diagnosis service, for detection of *Nosema*, *Amoeba* (*Malpighamoeba mellificae*) and Tracheal mites (Acarine or *Acarapis woodi*). Fera's MTU provides further diagnostics for a range of honey bee diseases and viruses, see below. Pests such as *Varroa* (including mites resistant to veterinary medicines), SHB, *Tropilaelaps* spp. and other Asian mites can also be identified.

For details of how to take a sample of bees, see BBKA News 183, page 16.

Once a bee sample arrives at our laboratory,



"Bagged and tagged" honey samples, collected as part of the statutory residue monitoring programme



NBU colonies, at the Sand Hutton apiary

diagnoses are carried out by technical staff, all of whom are trained in accordance with 'Good Laboratory Practice', a much sought-after internationally recognised quality system. Diagnosis usually takes about thirty minutes, and the beekeeper is notified of the result by letter. Beekeepers can also check their results, along with their full inspection history, by logging in to their individual record on BeeBase. In a typical year, NBU diagnostic staff handles about 900 suspected foul brood or exotic pest samples, 50 samples from import checks, and fifty samples submitted voluntarily by beekeepers. Colleagues in the MTU process approximately 1,200 bee samples for commercial diagnostics, and 1,955 for statutory purposes. Many beekeeping associations also offer a microscopy service.

Consumer and Environmental Protection

To ensure consumer safety, all EU member states have a statutory responsibility to monitor food for residues. For this reason, on behalf of the Veterinary Medicines Directorate (VMD), each year the NBU collects about one hundred honey samples from beekeepers as part of Defra's National Surveillance Scheme (NSS). Samples are always collected in the presence of the beekeeper, either from the brood chamber, super, bottled honey or bulk. Fera's residue research laboratories screen each for veterinary

medicine residues or other contaminants. Results are sent to the VMD, who write to the beekeepers involved, letting them know whether their honey was compliant, or whether any further action is needed. If necessary, a follow up visit will establish how contamination may have arisen and provide advice on how to avoid residues in the future. Read more about the programme and see overall honey testing results on the VMD's website www.vmd.gov.uk.

The NBU also works closely with Defra's Wildlife Incident Investigation Scheme (WIIS), which monitors the effects of pesticides on wildlife, pets and beneficial insects (including honey bees). Information gathered through the WIIS forms part of the approval process for pesticides and can also result in changes to product label recommendations. Information gathered through the scheme is not intended to be used as evidence to be used in civil litigation, but can lead to enforcement action being taken by the enforcer if the misuse or abuse of a product is identified as part of this process. The WIIS involves collaboration between four separate agencies. It is led by the Chemicals Regulation Directorate (CRD); Natural England manages the scheme on behalf of CRD and undertakes site enquiries into pesticide exposure; Fera carries out disease and pesticide analysis; the Veterinary Laboratories Agency carries out post mortems on wildlife. The NBU's roles are receipt and initial assessment of honey bee samples, adult bee disease diagnosis and liaison with beekeepers. If you suspect your bees have been poisoned, contact your local Bee Inspector or the NBU immediately. We can advise you on what to do. It is also a good idea to collect a sample of the affected bees – at least 200 bees will be required for analysis. If you wish, you may send this sample directly to the NBU with a covering letter explaining the circumstances, or you can wait for a bee inspector to visit. For full details of the WIIS, including how to submit a sample, please visit the Suspect Poisoning of Bees pages on BeeBase.

Gay Marris, Benjamin Jones, Selwyn Wilkins,
National Bee Unit

Standard Adult Bee Disease Diagnosis - £40.

A sample of thirty bees will be individually screened using standard microscopic techniques for the presence of Acarine, *Nosema* spp and *Amoeba*.

Screening for presence of *Nosema* spp - £10.

A sample of thirty bees will be tested using standard microscopic techniques for the presence of *Nosema* spp (positive/negative result).

Molecular pathogen screening (TaqMan® PCR)

- Test A for viruses including: KBV, DWV, BQCV, SBV, CPV, APV, IAPV, IV
- Test B for *N. apis* and *N. ceranae*. Prices for Test A or Test B are on a sliding scale, depending upon numbers of samples submitted. Samples 1 to 4 = £120/ sample; Samples 5 to 10 = £60/sample; Samples 11 to 20 = £50/sample; each additional sample after this = £30/sample.

BBKA Strategic Review 2011

Its Relationship with the Plant Protection Industry

Below is a reprint of a statement that I issued on behalf of the Trustees of the BBKA on 16 November 2010 that covers our strategic review.

As part of this review you will see that our policy with regard to our endorsement of specific products has changed. This decision was taken by the Trustees a while ago as part of this wider strategic review, and would have been announced in due course as part of the results of that review. It was however decided in view of the fact that a debate on the narrow issue of endorsement was likely at the forthcoming Annual Delegates Meeting (ADM) it was better to make the decision public at this time.

The statement refers to a wider engagement with the plant protection industry and as an example of the way this can work, you will have seen a leaflet inserted in this BBKA News produced by the Crop Protection Association (CPA). The BBKA was consulted on the production of the leaflet and tried to ensure that best practice in relation to honey (and indeed) other bees was incorporated.

Finally the trustees are putting forward a motion to the ADM asking for delegates support for this new policy. Details of this motion will by now be with association delegates and secretaries and I would ask that you debate the new policy locally and make your views known to your delegate in good time for the January ADM.

The Statement

As an educational charity, the BBKA is primarily concerned with the health and welfare of honey bees and seeks to educate, inform and influence all parts of society

including beekeepers, the public and industry, about honey bees. Over time, a number of arrangements have been made between the BBKA and third parties, who have been attracted to entering into relationships with the BBKA for a variety of reasons, but all of which have been agreed on the basis they will deliver benefits to honey bees. It is necessary to review strategically the appropriateness of these relationships from time to time to ensure that they continue to be relevant, effective and indeed do deliver the intended benefits.

Usually such arrangements have meant the granting or licensing of the use of the BBKA logo (which is a registered trade mark) on the literature and goods of the third party. The BBKA strategic review intends to assess the options and opportunities available to it to develop its brand name and to develop others.

One such strategic relationship has been the BBKA policy of actively engaging with the plant protection industry in an attempt to improve stewardship of pesticides and agricultural practice to minimise damage to honey bees and to ensure that the views of beekeepers are taken into account in the development of pesticides and their application in the field.

This relationship started in the 1980's and has taken a number of forms, including sponsorship of the BBKA's presence at the Royal Show and more recently, the BBKA has agreed to allow its logo to be used on four synthetic pyrethroid based products. These products on the basis of evidence provided and in conjunction with the stewardship activities of the supplying companies, appear to

offer reduced risks for harm to honey bees when used correctly. The BBKA has received modest payments for these endorsements part of which covers the costs of administration and meetings held to engage with the companies. Positive developments that have come from this policy have included the inclusion of the BBKA ten point guidelines into the UK Pesticide Guide, the so-called 'Green Book', published by BCPC and most importantly, significant reductions in bee colony losses attributed to pesticides, from one hundred or so per annum in the 1990s to the current negligible figures.

The four products currently subject to BBKA endorsement are today of declining commercial importance and the development of new classes of pesticide and application techniques means that the relationship with the plant protection industry should be reviewed. The way in which the BBKA will engage with the industry as a whole and individual companies will vary, but an example of the wider approach to be pursued is the co-operation over the production of the recently published Crop Protection Association (CPA) leaflet 'Bee Safe, Bee Careful' which bears the BBKA and NFU logos.

As a first step in the overall review of strategic relationships the BBKA Trustees have decided that it is time to broaden the range of engagement with the crop protection industry beyond the narrow focus of endorsing certain products; rather to contribute more directly to the development of new regulatory criteria for pesticide approval with the Chemicals Regulatory Directorate (CRD) and to further support the industry in the general move to

improve countryside stewardship. For example, this might include promoting specific initiatives such as nectar bars, tree planting and restoration of hedgerows.

Following discussion with the companies involved, the BBKA Trustees have decided that endorsement and related product specific payments will cease as soon as practically possible.

The Trustees do not preclude accepting funds in the future from either the crop protection industry in the guise of the CPA or individual companies nor other organisations involved in horticulture and agriculture, which are beneficiaries of honey bee activity. The Trustees have no specific funding proposals in mind at present, but for the sake of clarity do not wish to be constrained by any notion of working with one particular industry on a 'free' basis, whilst accepting funding from individual and other corporate members to fund its activities. For example the Trustees may wish to invite companies to fund a future research colloquium, to exhibit at the BBKA Spring Convention or make a contribution to the BBKA Research Fund.

As part of its strategic review the BBKA is developing a range of other products, including literature, a distinctive house style, sponsorship, logos and devices and wishes to be able to further develop these to maximise their impact and financial benefit. It is essential that any contractual arrangements made meets the requirements of the BBKA strategy for the coming years, with the overall aim of encouraging society to take measures which will help honey bees.

Martin Smith, BBKA President



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BBKA ADM – 15 JANUARY 2011

ADM Nominations

Nominations for the Executive Committee

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

David Aston, Douglas Brown, Thomas Canning, Roger Patterson, Michael Sheasby and Michael Young MBE

Nominations for the Examinations Board

There are three vacancies for three years

Thomas Canning, Pamela Hunter and Peter Sutcliffe

Propositions for Presentation at the 2011 ADM

Applications for Membership of the BBKA

Proposition to join BBKA as a Member Association

Cleveland BKA

Proposition to join as a Specialist Member

The Instrumented Hive Project

Propositions for Consideration

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

01/2011 BBKA Executive Committee Proposition

That the capitation rate payable in respect of each registered member shall increase by £1 to £15 per annum in respect of all members registered with the BBKA from 1 December 2011 onwards. The rates for Partner members and Country members shall increase pro rata.

02/2011 BBKA Executive Committee Proposition

That the delegates support the current comprehensive review that BBKA Trustees are undertaking as part of its strategic development for 2011 and beyond of the way in which the BBKA should manage its intellectual property. This includes the use of its logo and maximises the benefits which can be gained from these assets and its reputation. In particular the Trustees ask ADM delegates to note the decisions already taken by the Trustees with respect to the cessation of BBKA endorsement of certain pesticides as outlined in the BBKA statement dated 16 November 2010.

03/2011 Twickenham and Thames Valley with Mole Apiary Club

That the BBKA cease any commercial relationships with agrochemical or associated companies relating to the use of the BBKA logo, including all endorsement of pesticides (for money or any other form of remuneration) as soon as contractually possible.

04/2011 BBKA Executive Committee Proposition

Amendment to the BBKA Constitution

That Clause 7.3 'Partner Members' is amended by removing the word 'Adult' to make it read: 'Individuals, being members of an AMM or one of its component associations who reside at the same address as a

Registered Member, as defined in Clause 7.2 and who meet the requirements set out in Clause 7.2.'

05/2011 Worcestershire Beekeepers Association

That BBKA should introduce a category of Junior membership for individuals under the age of 18 (on 31 March of the membership year).

06/2011 Cumbria Beekeepers' Association

That the Trustees consider setting up a committee to promote queens bred in the UK and report back at the next ADM. Such committee would set up a series of standards expected from good quality queens and establish queen breeders, who can demonstrate that they can meet the standard and supply the market with those home grown queens. Such breeders can then apply to the committee for BBKA endorsement of their product.

07/2011 BBKA Executive Committee Proposition

Amendment to the BBKA Constitution

9.1 and 9.2 to read:

9.1 Each AAM shall send to the BBKA additions, amendments and deletions to the Register of Members throughout the year as soon as reasonably possible after they become available. This information will be taken as proof of Registration with the BBKA for the supply of a membership card and the delivery of newsletters and other communications as appropriate. The format and frequency of such updates will be determined by the Executive Committee of the BBKA to meet current operational needs.

9.2 The BBKA will issue to each AAM a complete list of the AAMs membership biannually to allow the AAM to make any corrections before the primary date of 1 April and secondary date of 1 September at which times the list will be used to amend the register and provide an accurate invoice to the AAM for capitation. The BBKA will not refund any capitation fee in respect of the remainder of a membership year in which a deletion occurs for whatever cause.

New General Secretary

After sifting through nearly ninety applications for the position of BBKA Operations Director/General Secretary and two series of interviews to get to a final short list I am pleased to inform you that we have agreed to appoint Ms Jane Moseley to the above position.

Jane is a beekeeper and is currently Honorary President of Hertfordshire Beekeeping Association, and Secretary of Bishop's Stortford BKA.

With significant experience in Sales and Marketing including sponsorship and exhibitions with a number of Blue Chip clients as well as significant on line sales expertise Jane will find plenty of areas within the BBKA where these talents will be fully utilised.

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Book Review

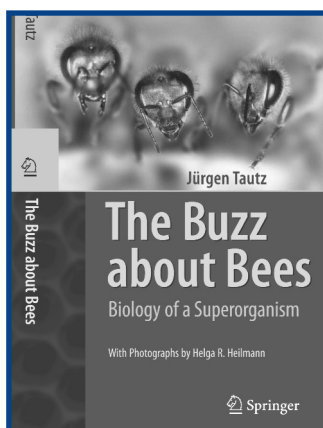
The Buzz about Bees – Jürgen Tautz

In some ways *The Buzz about Bees* – the Biology of a Superorganism by Jürgen Tautz (with photographs by Helga Heilman and translated from German by David Sandeman; Second printing 2009; published by Springer; ISBN 978-3-540-78727-3) is not an easy read, but rarely have I come across a book on the honey bee that so richly rewards the effort of careful study.

This is a quite an extraordinary book in so many ways. It is one of the best produced books that I have read for a long time and the quality of the accompanying photographs is exceptional. The review copy of the book was a second edition – being a translation from the German first edition – and with a few exceptions the translation is excellent. The text is lucid and direct with very little wasted space or unnecessary comment. The German Preface to the first edition is included and in that Preface some words of Karl Von Frisch are quoted 'The honey bee colony is like a magic well; the more one removes from it, the stronger it flows.' This book does more to reveal some of the many secrets of the 'magic well' than almost any other book on the honey bee that the reviewer has read.

The central theme of the book is that a honey bee colony should be regarded as a superorganism – i.e. considering a bee colony as a single 'being' – a single integrated living organism.

The book is jammed packed full of facts about the individual actions of the honey bee and the combined activities of the honey bee colony. There are many gems in this book and there is much that was new to the reviewer – examples of which are almost too numerous to list. The chapter on the colour perception of the honey bee is one such example. Others include the fact that bees usually land against the prevailing wind; that flowers leave an 'empty' signal to tell bees that working other plants would be more profitable; that the hive contains several distinct and chemically marked dance floors for those bees that dance upon to indicate potential nectar sources; that new bees that have been recruited as the result of the waggle dance are led to the source by more



experienced bees; that certain bees act as the vital functions as 'heater' bees to warm the sealed brood and that these bees also climb into cells that have been specifically left empty to assist with warming brood in adjacent cells; that because of the frames beekeepers use to mount foundation attenuate the vibrations that bees use to communicate within the colony, the bees often remove sections of the foundation around the edges of the frame to enable the comb to vibrate better; that bees add propolis to the rims of cells to 'tune' the vibration of the comb and to reinforce the cell structure. The author lists nine different functions of the comb – including its use as part of a 'telephone system'.

This book contains the clearest description of the various actions of a swarm that the reviewer has read and the chapter on the collection of nectar and pollen is a model of clarity and precision. The facts just keep pouring out – that the average colony produces 300kg of honey per year which requires 7.5 million excursions by bees – amounting to 20 million kilometres flown by the bees in a single year; that it takes 25 flights to fill a single cell; that 20-30kg of pollen is collected each year – as the result of 2 million foraging flights.

The reviewer's understanding of bee biology was greatly expanded by reading this book and it has also resulted in a complete re-think of his understanding of the behaviour of bees. It has also evoked a greater sense of wonder and awe at the remarkable product of evolution that is the honey bee.

At the heart of this book is the plea that all those interested in honey bees should not just consider the individual bee, but rather the individual as part of a superorganism which is much more than the simple sum of all its parts. It is an outstanding book that all should make the effort to read.

Dr Stephen Palmer, FRGS FLS

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29th January 2011

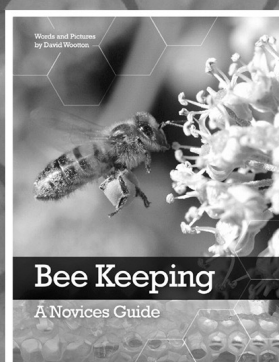
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Your Letters

Woodpeckers and Beehives

Two points on this subject:

Firstly if there is a thatcher in your area, ask him to let you have some wire next time he strips a roof. He cannot reuse it but it will be perfectly good for protecting your hives. You might need some of that ubiquitous currency our bees produce.



Secondly change from those infernal handholds in single-walled hives to rope handles. Not only do they eliminate that weak point but there is no more hanging on by your fingertips and they are much more stable if two of you are carrying a box or boxes. If you have a batch of boxes made you can negotiate a better price because it is one less machining operation. We have had them on our Smith hives for the last thirty years and they are a great improvement in every way.

Paul Edwards, Beekeeper's Labourer and Coarse Carpenter

Double Trouble for 'The Forager'

I read The Forager's column with interest but do not always agree. I have come to think that the beekeeping texts, from which we learn, do not pay sufficient attention to the bees we keep.

Colony Management should be tailored to the prolificacy of the bees and the flows in our area. British Black bees can be quite happy in a single National brood chamber (BC), a non prolific race. On the other hand I have handled Italian bees that needed three Langstroth brood chambers with brood occupying 23 or more frames.

My own area usually has a good spring flow to the end of May but then of recent years a wet rainy summer, when bees can starve if you have taken the spring honey off completely.

I used to think that my single BC Langstroth hives were the ideal compromise in size; equating to about a brood and a half in comb area. However, my most successful colonies were becoming more prolific mongrels from my preferred Black bee. They gave a splendid early crop but then tended to swarm. This could be controlled in one of two ways; giving them a second brood chamber with plenty of comb to draw out or if they insisted, splitting them and raising new queens.

Taking a leaf out of Ron Browns double BC method, I could unite any new queens to make a very strong double BC colony for the summer flow (if it came) or autumn balsam.

Taking double BC hives into winter meant that no feeding was necessary and the bees seemed to love it, they ate about a full Langstroth BC of stores and could be compressed down to one BC in the spring, whilst the old combs were mostly renewed or retained as store combs.

The bees always had plenty of stores and seemed to repay this winter regime with a bumper spring harvest.

Lifting full Langstroth BCs is something I have to be careful with as my strength declines but largely I tip the upper BC to inspect for queen cells.

In short, I am recommending selecting the bees for your area flows and your preferred management style and then tailoring the management to suit. A 'one method fits all' is not what I would advise.

May all your supers be heavy.

Ian McLean, NDB

Am I a grumpy old man?

I am fortunate in having several friends who send me articles about beekeeping from their local or national papers. Thanks to the BBKA publicity effort there have been quite a lot of these recently, a great encouragement to consider taking up beekeeping.

These articles are well illustrated with beekeepers suitably suited except that they are all wearing gloves, often the thin medical type. It seems to me that has been copied from the Bee Inspectors who wear such gloves. But the Inspectors are working in quite different circumstances to those of the new recruit.

I suggest that new members be encouraged to work without gloves, it has been my experience that the feeling of risk makes for more careful handling which in turn leads to quieter bees. To observers the sight of unharmed bare skin will reduce the innate fear of being stung, and with it the possibility of complaints about the keeping of threatening insects. Perhaps such a change will reduce the loss of members after a short time of working with bees.

Which message do we want to send to the general public?

'Bees are dangerous'

or

'Bees accept careful handling''

Grumpy Old Man

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Examination Dates 2011

Module Examinations

19 March 2011

(Applications in by 10 February 2011)

Advanced Certificate in Beekeeping Husbandry

18/19 June 2011

(Applications in by 28 February 2011)

General Certificate in Beekeeping Husbandry and Microscopy date by arrangement with the Examinations Board Secretary

(Applications in by 28 February 2011.

Microscopy Assessment takes place in autumn)

Basic and Junior Certificate date by arrangement with the County Examinations Secretary *(Applications one month before assessment)*

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 John Webb, Podimore, Somerset
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 Kate Wilkinson, London, N22
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 Ron Wilson, Shrewsbury, Shropshire

Andrew Wilson, Broughton, Preston, Lancashire
 Anthony Wilton, Hordle, Lymington, Hampshire
 David Wingham, Releath, Camborne, Cornwall
 Joseph Wood, Ogden, Halifax, W Yorkshire
 Jeremy Wood, Bishop Auckland, County Durham
 Angela Woods, London, NW5
 Alan Woollhead, Wychbold, Worcestershire
 Gillian Wright, Ribchester, Lancashire
 Graham Young, London, W9
 Renate Young, Cheltenham, Gloucestershire

Successful Candidates for the Advanced Husbandry Certificate

Richard Bache, Drayton, Somerset
 Keith Bartlem, Carthorpe, Bedale, N Yorkshire
 Daniel Basterfield, Ottery St Mary, Devon
 Don Cooper, Roughon, Norwich
 Ray Dowson, Ormskirk, Lancashire
 Pamela Hunter, Cowfold, West Sussex
 Adam Leitch, Reigate, Surrey
 Mike Rowbottom, Otley, Harrogate
 Ian Stell, Catford, London
 Alastair Welch, Hindhead, Surrey

Successful Candidates for the General Husbandry Certificate

Paul Aldred, Preston, Lancashire
 Daniel Basterfield, Ottery St Mary, Devon
 Stephen Brain, Kenn, Clevedon, N Somerset
 John Chapple, Acton, London
 Peter Chapman, Scarborough, N Yorkshire
 Simon Foster, Teddington, Middlesex
 Terry Gibson, King's Lynn, Norfolk
 Edward Gradosielski, Nazeing, Essex
 Charles Millar, Church Stretton, Shropshire
 David Rayner, Clitheroe, Lancashire
 Joan Telfer, Pinner, Middlesex
 Serena Watts, Reading, Berkshire
 Kay Wreford, Lynsted, Sittingbourne, Kent

Candidates gaining the Master Beekeeper Certificate

Richard Bache, Drayton, Somerset
 Keith Bartlem, Carthorpe, Bedale, N Yorkshire
 Ray Dowson, Ormskirk, Lancashire
 Pamela Hunter, Cowfold, West Sussex
 Ian Stell, Catford, London
 Alastair Welch, Hindhead, Surrey

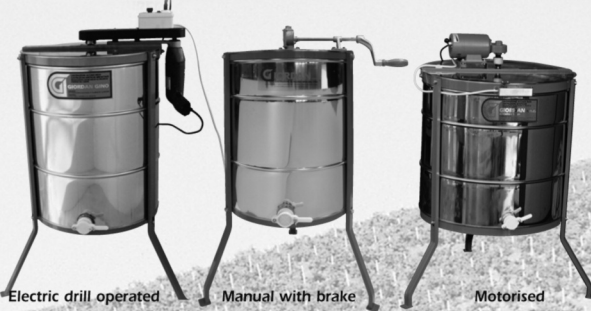
Congratulations to these successful beekeepers.
Val Francis, Exam Board Secretary



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Business Corner

Train the Trainers' Days

A Brief Background

As increasing numbers of people take up our joyful and addictive hobby, amid concern over honey bee decline, those that train new beekeepers are being put under increasing strain to meet the demand for high quality training.

Year on year this pressure is increasing as new beekeepers demand courses for those in their second or third years as a beekeeper. In order to help local associations continue to provide quality training a partnership of the British Beekeepers' Association (BBKA), the Welsh Beekeepers' Association and the National Diploma of Beekeeping Board (NDB), jointly funded by Defra, has undertaken to provide training for 400 district or branch trainers. This is a part of a much larger education project building a suite of training resources for all levels of beekeeping from beginner to NDB.

My Role

Initially, my role is to organise a series of Train the Trainer events, based loosely on the NBU regions, for those interested or already involved in training new beekeepers. As the role develops further training for trainers at all levels will follow including the BBKA Course in a Case, a six-level competency model resource, material produced by Fera, the NDB and the use of education professionals. I hope I am qualified to do this well: I am an active beekeeper caring for around ninety colonies in total. Many of these are used for disease research by the Institute of Integrative and Comparative Biology, University of Leeds. I also keep bees for several companies as well as producing enough honey for several shops and the farmers' market. I am an active member of Yorkshire BKA. I have been involved in education with over thirty years of secondary teaching experience and as a Vocational Training assessor.

Ormskirk - 23 October 2010

The first of the 'Train the Trainer' events was held in the north west region with beekeepers from as far away as Anglesey and from across the border in Yorkshire, in attendance. A huge programme was packed into this quality event held in the very pleasant learning environment of Edge Hill University. Experts from BBKA and NBU together with holders of the NDB joined forces with members who run local training courses to fill the day with good sound advice on what should be taught to new beekeepers and how it can be taught well. Emphasis was placed on getting the trainees involved in their own learning by, for example, allowing them to examine a colony (under instruction from a trainer) rather than the trainer continually demonstrating how to do things. Many speakers also stressed the need to work in small groups, especially for practical training sessions, suggesting one trainer to five trainees.

Again and again the need for careful planning of courses and of each session was stressed. The Course in the Case provides guidance on this structuring and contains many high quality resources for use by trainers. Exactly what is taught and how it is taught will depend on the nature and experience of the trainees. Many speakers emphasized the need for trainers to find out something about the trainees, their previous experience and what they hope to learn by attending the sessions. To this end the beginners' CiC contains a basic Individual Learning Plan for trainees to use. A simple example was given of the person who, after attending ten winter theory sessions, on looking into a hive for the first time said 'Oh! I thought that the bees would be big and fury'. Perhaps an early session on 'What is a honey bee?' might have been helpful?

Martin Smith, BBKA President, gathered the many threads from the day together with a reminder that each association has a pool of talent so that training can be the glue that enables members to contribute to a cohesive learning team.

*Bill Cadmore,
BBKA Regional Beekeeping Tutor Training Organiser*

Course on a Case Update

Orders being taken for the new Novices case

The launch of the 'Novices' Course in a Case (the yellow CiC) at the National Honey Show generated considerable interest and orders are now being taken. The Novices CiC is intended to aid trainers teaching beekeeping up to a level where their students could attempt the BBKA Basic Qualification.

There will not be a free distribution of the Novices CiC but it will also be available at £50 plus P&P, limited to one per association or branch, which is substantially below the production cost. This offer is also extended as above to other beekeeper training organisations.

Development of the Novices CiC has been partly funded by Fera and is part of the continuing commitment by the BBKA and Fera to beekeeper education.

Chris Deaves, Chair of Education and Husbandry

Directory of Lecturers and Demonstrators

A Directory of Lecturers is included in the BBKA Year Book. If you give talks or demonstrations and would like your contact details to be included in the BBKA Directory of Lecturers and Demonstrators, please contact Margaret Anderson at the NBC

From the Boardroom

The November meeting of the Executive is very much focussed on ensuring actions agreed at 2010 ADM have been completed or are in progress and to look forward to any propositions for 2011 ADM including any that the Executive want to raise.

Time was taken to look at 2011 budget forecasts and whether estimates made appear reasonable.

Following on from previous meetings and discussions around BBKA's changing relationship with the Agro-Chemical industry part of the meeting was devoted to seeking a consensus view from those attending and I was heartened by how any differences there were, were so small to be easily accommodated, proving the value of the months of discussion.

There is always time taken to question any items from the thirteen different committees that Trustees are involved in, or discuss any areas of significance.

These included an update on CiC discussions with Fera and ongoing progress with Train the Trainer days, and reports of meetings with Lord Henley and other members of Parliament as BBKA continues its efforts to get as much support from Government as possible. There were discussions about the Northern Co-op's plans for putting hives within City Farms in 2011, progress with BBKA strategic direction draft plans and brief update as to progress in seeking further sponsorship for 2011 Adopt a Bee Hive.

The November meeting is also the last meeting that any Trustees not standing for election in the following year's ADM; this year Pat Allen is leaving the Executive and I would like to thank her on behalf of all BBKA members for the time she has given to beekeeping issues nationally via her thoughtful contributions to the issues and arguments discussed.

Brian Ripley, Chairman

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Awards

The Worshipful Company of Wax Chandlers has awarded the prize for the Best Master Beekeeper to:
Ian Stell of Catford, London

News about BBKA News!

Over the years BBKA News has grown from a simple four page newsheet into the 28 page magazine that we all recognise today.

Our editor has worked wonders developing the publication, commissioning a wide range of authoritative and informative articles; and all on the tightest of budgets. A big step forward came when direct mailing started a few years ago using the Members' Register and spot colour was added later with a modest redesign. The publication has grown beyond all recognition and pressure for space has meant that the publication has become very 'type heavy'. The Executive has thus approved a revamp in order to improve readability which will involve two key changes as part of the redesign. Firstly, the publication will go to full colour which will mean better reproduction of photographs and diagrams. Secondly, it will go monthly, more pages overall should allow more 'white space' to the benefit of our authors and our readers. These changes require a great deal of preparation and will be introduced when finalised during 2011 – something to look forward to.

Brian Ripley, BBKA Chairman

Ideas for Christmas that help the honey bee

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We have arranged a discount just for BBKA members on stationery for sale on the Adoptabeehive web shop, with 20% off all cards.

- Christmas cards, set of eight, two different snowy beehive scenes
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- Rainbow notelets, set of seven, honey bees on colourful flowers
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- Gold print wood cut skep cards, set of six
- Price to BBKA members £4.48 (saving £1.12 on each set)

All profits from the sale of these cards go towards the research and education fund to support the honey bee. For example money from BBKA sales has recently been awarded to Ron Hoskins to help develop his varroa resistant bees.

To take advantage of this offer you must order BY PHONE **0871 911 181** (calls cost no more than 10p minute) and quote 'BBKA 7 member offer'.

'Adoptabeehive' and 'Spread a little Sweetness' sets would also make an unusual present and help the honey bee, and can also be bought online at www.Adoptabeehive.co.uk or by calling 0871 911 181

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Diary of Events

2011

29 January - IBRA. Varroa, Still a Problem in the 21st Century. University of Worcester, p 13

19 February - Somerset BKA Lecture Day - Ged Marshall, Adam Hart, Michael Keith-Lucas, Robert Carpenter-Turner and Adam Vevers. Details from Caroline Butter, e-mail: educationofficer@somersetbeekeepers.org.uk or 01934 742075

12 March - Cambridgeshire BKA, "'Better bees and better beekeepers'", covering Varroa, Bee improvement, Management, Queen rearing. David Aston, Norman Carreck, Roger Patterson, Andy Wattam. Contact David J. Abson, 6 Ascham Lane, Whittlesford, Cambridgeshire, CB22 4NT (SAE appreciated) 01223 834620

13 April - Somerset BKA, Special Lecture, Keith Delaplane, at Hazlegrove School, Sparkford on the A303

15-17 April - BBKA Spring Convention, Stoneleigh, page 15

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