THE ESSEX BEEKEEPER

Asian Hornet hawking at the hive entrance

Photo via eBees

Monthly Magazine of the
Essex Beekeepers' Association
www.ebka.org
Furthering the Craft of Beekeeping in Essex
Registered Charity number 1031419

Issue No. 647 November 2018

Divisional Meetings around the County

Meetings in November:

1 Nov	**Thursday 8.00pm**	**Romford**	**Journey from beekeeper to bee farmer** - Michael Coe. Chadwick Hall, Main Road, Gidea Park RM2 5EL
1 Nov	**Thursday 8.00pm**	**Harlow**	**BeeBee Wraps**. Kings Church, Red Willow, Harlow CM19 5PA
3 Nov	**Saturday 10 - 4pm**	**COUNTY EVENT**	**Annual Conference** hosted by Braintree Division. Great Leighs Racecourse, Chelmsford CM3 1QP
7 Nov	**Wed 7.30pm**	**Saffron Walden**	**Making cosmetics** with bee products, including soap making demo - Sara Robb. Sewards End Hall CB10 2LG
15 Nov	**Thursday 7.30pm**	**Epping Forest**	**The Asian Hornet - a film night.** Chingford Horticultural Hall
16 Nov	**Friday 7.30pm**	**Chelmsford**	**Centenary Dinner**. The County Hotel, Rainsford Road, Chelmsford.
19 Nov	**Monday 7.30pm**	**Chelmsford**	**Beekeeping around the World**. John Beasley. The Link, Rainsford Road, Chelmsford CM1 2XB
21 Nov	**Wed 7.30pm**	**Dengie 100 & Maldon**	**George Clouson, Arnia - Monitoring Bees.** The Oakhouse, High Street, Maldon CM9
28 Nov	**Wed 7.30pm**	**Southend**	**Divisional AGM** - W I Hall, Bellingham Lane, Rayleigh SS6 7ED
29 Nov	**Thursday 7.00pm**	**Saffron Walden**	**Christmas Quiz**. The Three Horseshoes, Duton Hill, Dunmow CM6 2DY
30 Nov	**Friday 8.00pm**	**Braintree**	**Soap making - talk and demonstration** - Dr Sara Robb. White Notley Village Hall CM8 1RH

Meetings in December:

6 Dec	**Thursday 8.00pm**	**Harlow**	**Christmas Party**. Kings Church, Red Willow, Harlow CM19 5PA
6 Dec	**Thursday 8.00pm**	**Romford**	**Christmas Social**. Chadwick Hall, Main Road, Gidea Park RM2 5EL
10 Dec	**Monday 7.30pm**	**Chelmsford**	**Decorating Honey Jars.** The Link, Rainsford Road, Chelmsford.CM1 2XB
12 Dec	**Wed 7.30pm**	**Dengie 100 & Maldon**	**Skep Beekeeping - Chris Clark.** The Oakhouse, High Street, Maldon
13 Dec	**Thursday 7.30pm**	**Epping Forest**	**Divisional AGM & Winter Dinner**. Chingford Horticultural Hall.
14 Dec	**Friday 7.30pm**	**Braintree**	**Divisional Honey Show & Christmas Social**. White Notley Village Hall CM8 1RH

In October's issue I got the names of the above gentlemen wrong.

They are (from left to right) Mick Lovell, Michael Coe and John Barlow .

My apologies. Editor

In this issue:

EBKA SHOW COMMITTEE

In last month's edition, Pauline Tidmas, the Show Secretary reported on this year's hugely successful Show. Both Pauline and Vernon Amor, the Show Treasurer indicated at the last Show Committee meeting that they intended to retire from those posts. On behalf of the Committee and our members, I would like to thank them both for their dedication in undertaking these roles.

We are now looking for members of the Association to take on these roles and to be part of the vibrant and energetic Show Committee which represent Divisions coming together to arrange and hold the Annual Honey Show.

If you would like further information about the role of Show Secretary or Show Treasurer, please contact me on: chairscebka1@virginmedia.com

Both Pauline and Vernon have agreed to assist their replacements, together with the other Show Committee members, in planning for the 2019 Show.

Finally, I was delighted that Barbara Sharp from Colchester Division attended the last Show Committee meeting. If a member from Colchester Division would like to join the Show Committee on a permanent basis, we would then be a truly County-wide Committee with all Divisions coming together to showcase the wide-ranging craft of our beekeepers.

Michael Webb - Chair of EBKA Show Committee

The Asian Hornet

(*Unfortunately, becoming a regular feature of the news)*

The first sighting of an Asian hornet was seen in the UK in 2016, with a nest destroyed. Most recently, on the 26th September 2018 the NBU reports:

A report of an Asian hornet sighting made on the 22/09/18 by a member of the public in ***New Alresford, Hampshire*** *and was found the following day by the National Bee Unit. The nest has been destroyed and sent for laboratory examination*

The NBU are also investigating a report of a single hornet on the south coast of Hampshire.

The NBU is continuing surveillance for further nests and beekeepers across the UK are urged to remain vigilant and to report any sightings either via:

Asian hornet Watch App for android, the

Asian hornet Watch App. for Iphone, email, or the

online recording form.

Surveillance is ongoing in Fowey, Cornwall. No hornets have been seen at this location since the two nests were destroyed earlier this month.

What is Robbing ?

Robbing is a situation in which a beehive is attacked by invaders from other hives. The invasion is serious for a bee colony for a number of reasons:

A hive defending itself against robbing will fight to the death. This battle can result in the loss of many bees and even destroy an entire colony. If the hive is unable to defend itself the invading bees (or wasps) can strip the colony of all its food. Being robbed changes the disposition of a hive. The bees can become nasty, aggressive, and difficult to deal with.

In the Autumn when feeding your bees after any honey flow has ended is a prime time for robbing to start, so be on the lookout for the tell-tale signs.

Indicators of Robbing

A colony that is under attack will appear to be more active than it previously was, but the activity at the entrance is different. Bees when they are coming back to their own hive land on the periphery of the entrance then walk in. Bees that are robbing will dart around at the entrance, then make a dash for it, but straight for the entrance, not landing on the periphery as bees from the colony will.

Photo credit: UF/HBREL

Bees fighting outside a hive is an early sign and can be confirmed by the erratic and characteristic 'zig zag' flight of the robbers on approach to the target hive. Guard bees recognise this flight pattern and will be on high alert. They challenge and examine all entrants for a period of about 1-3 seconds by antennal contact to determine a nest mate from an intruder by their odour. An intruder is usually mauled by the guard clamping onto a leg or a wing and curling the abdomen into a position enabling it to sting. A fight ensues and the robber is marked with 2 heptanone from the mandibular glands. Other guard bees recognise the alarm and raise their abdomen and sting chamber releasing a further alarm pheromone, isopentyl acetate.

If unable to escape, the robber is stung and dies. If your sense of smell is good you will be able to smell the alarm pheromone which has a banana-like scent and if you smell this when examining the hive, be prepared for an attack, or close up the hive till a later date.

If you take the crownboard off, robber bees will fly out in a hurry. Capped honey in the frames will have the cappings ripped off and the holes will have jagged edges. If a target colony is weak and succumbs to attack, silent robbing ensues.

The colony continues to work normally, while at the same time robbers enter and leave the hive unhindered. The only tell tale sign now is the flight of the robbers returning directly to another hive. Also, robber bees leaving the robbed hive, fully laden, will have the rear legs forward as opposed to a bee leaving the hive on a forage flight, unladen, when the rear legs will be trailing. Eventually, the robbed colony will be devoid of stores, may abandon the hive or even die off.

Dealing with Robbing

Once robbing starts it is difficult to stop, so it is important to prevent it - robbing is often brought on by the actions of the beekeeper spilling sugar syrup on the floor, leaving brace comb in the apiary or leaving hives open longer than necessary. Prevention measures include feeding your bees at dusk when flying has ceased to reduce any excitement and prevent the flying bees from leaving their hive to search for the food source, feeding all colonies at the same time and reducing the size of the entrances down to about 'four bees wide' or 10 mm so they can be more easily defended - especially important for nuc colonies.

One method that is advocated to stop robbing is to lean a sheet of glass (or polycarbonate) against the entrance. The rightful entrants will find a way round it, but the robbers will keep flying into the glass and give up. You can also try putting some small branches with leaves on in front of the hive to confuse the robbers.

In an apiary if there is only one colony doing the robbing and one being robbed it is often sorted out by swapping places. This seems to confuse them and generally works. If the robbed colony has taken a bit of a beating, then close the hive and move it three miles or more away. In its place put a brood box with some honey on a plate or saucer inside, or if there is a frame in another colony, preferably the robbers colony, with a small amount of liquid stores in, then place that in it. Once the robbers have cleared it up they should quieten down and return to normal.

courtesy of a number of sources, Lancashire & North West BKA,
Dave Cushman, Beekeeping for Dummies

How *DO* Honey Bees Taste ?

(and use taste to manage foraging and nectar storage)

John Eaden - Manchester & District BKA via eBees

Honey bees are unique among social insects in collecting and storing food supplies in sufficient quantity for the whole colony to survive through the Winter when forage is scarce or non -existent. The honey bee has solved the problem of deciding which nectars are worth collecting and when the resulting honey has reached a sufficiently low water content to allow it to keep without fermenting.

Honey bees have taste receptors on their legs, antennae and outer mouth-parts as well as inside their mouth. It is difficult to measure directly the response of individual taste receptors in a living working bee, so it is unclear whether the sensors on the legs and antennae are directly involved in feeding behaviour. Close examination of the mouthparts reveal that as the bee sucks up nectar into its honey crop the sweet liquid passes no fewer than 200 taste receptor cells.

98% of nectar consists of sugars dissolved in water, with a concentration which can vary widely between 5% and 80%. Many nectars contain mainly sucrose, some flowers secrete nectar with a mixture of fructose and glucose in equal proportions with sucrose, while others contain just fructose and glucose. The remaining 2% is made up of a variety of other compounds - lipids, acids, minerals and vitamins.

Sucrose is a disaccharide, a large molecule which is more difficult to dissolve in water than the simple monosaccharide sugars fructose and glucose. This is very significant for the production and storage of honey. Honey bees mix enzymes from their hypopharangeal glands in their head with the nectar to convert sucrose into fructose and glucose. The resulting solution of these more soluble sugars can, in the warmth of the hive, lead to a very concentrat-ed sugar solution.

The fanning action of the bees helps to concentrate the nectar still further by evaporating water and this eventually leads to ripe honey which the bees then seal with a water-proof wax cap. The concentrated sugar solution creates an environment which dehydrates the cells of any bacteria and yeasts in the honey, which otherwise would cause fermentation and spoil the valuable food stores in the hive. This is why it is important not to extract honey which has a water content of more than 20%.

Bees also produce the enzyme glucose oxidase which catalyses the oxidation of glucose into gluconic acid and hydrogen peroxide. These substances combine to form a powerful antibacterial action which further helps keep the honey in good condition.

Researchers have measured the response of individual taste receptor cells in the mouthparts of honeybees. The results show that the receptors do respond to stimulation by the sugars, sucrose, fructose and glucose. Behavioural studies of foraging bees have also shown that the sensitivity of bees to the sugar concentration in nectar varies according to the abundance and nature of the available forage.

Bees sample the nectar of the flowers they visit before deciding whether to collect it. When forage is plentiful only nectar with high sugar concentration is accepted. When forage is sparse then the bees begin to accept nectar with a higher water content, even though it will require more effort and energy to convert it into honey. This is where the collective behaviour of the colony becomes important. Returning foragers are met by house bees who specialise in receiving nectar. These bees taste nectar from many different sources in the neighbourhood of the hive and thus can compare their quality. A returning forager offers a sample to the receiver. She will quickly unload a good sample and this stimulates the forager to do a waggle dance to recruit others to that source. On the other hand, if the nectar is poor, the forager has difficulty in getting it unloaded. She may then decide to abandon her forage patch in favour of another one being signalled enthusiastically by her fellows. The colony as a whole thus constantly monitors the state of the surrounding forage and adjust the behaviour of the foragers to try to get the best out of the available nectar. There is still much that we do not know about the physiological mechanisms which govern the collection and storage of nectar.

Postscript *Of course the real answer to the question "How do honeybees taste?" is that it depends what you dip them in before you deep fry them!*

Photographs - Manchester BKA / scacc.us

How much pollen do bees need?

There is lots of advice on what gardeners can do to help bees and other pollinators, most of it focused on what sort of plants we should be growing. It is all very well growing the right plants, but are we growing enough? And how many is enough anyway? In attempting to answer that question, let us focus on bees, nearly always the most important pollinators and the ones that depend most completely on flowers. Also, let us consider pollen, rather than nectar, because although bees need both, pollen is a vital protein-rich food for raising young bees. Nectar is to some extent a renewable resource, which flowers can produce more of, but pollen is not. When a flower opens, it contains a fixed amount of pollen, and when it has gone, it is gone!

So how much pollen do bees need, and what does that mean in terms of flower numbers? Those who had the job of devising the measures targeted at pollinators in the *defra* Countryside Stewardship scheme asked themselves the same question, and quickly realised that a lot of educated guesswork would be needed to arrive at any kind of answer. For most bees we do not know how many colonies or nests there are per unit area of garden or countryside, or how much pollen is needed for each bee larva, and for most plants we do not know how much pollen there is per flower.

A team led by Dr. Lynn Dicks at the University of Cambridge, did its best, and its deliberations were reported in a recent paper in the journal *Ecological Entomology.* Their main conclusion was that rearing bees takes an awful lot of pollen, and thus an equally large number of flowers. Earlier Swiss work had already shown that it takes the pollen from tens or even hundreds of flowers to raise a single, small, solitary bee larva. Data for British wild flowers and much larger bumblebees suggest that the Countryside Stewardship on requirement of two hectares of flower-rich habitat per 100 hectares of farmland is enough, just, only if you make the most optimistic assumptions.

Make more pessimistic assumptions about pollen supply and demand, and there is no way any feasible scheme could even begin to supply the quantities required. The inevitable conclusion, that intensive farmland does not even come close to supplying the needs of bees, makes sense of other

research. Bigger bees need more pollen, and although it is well known that all bees have tended to decline recently, larger bees have suffered more than small ones. In the Netherlands, large bees have become measurably smaller over the past 150 years, almost certainly because smaller bees can make do with less food. Small bees have not changed in size. Dutch citizens have become 10 per cent taller over the same period, largely as a result of improved nutrition, mostly from intensive farming, so our gain is the bees loss.

The message is simple. Growing the right flowers is important but it is at least as imperative to grow lots of them. You cannot have too many flowers, especially in March and April, when the queen bumble bees are waking up and establishing new colonies.

The Daily Telegraph (edited). Ipswich & East Suffolk BKA via ebees

Feeding Bees ……

In the September issue of *The Essex Beekeeper*, I included an article on 'Winter Feeding Practicalities' by Mike Rowbottom of Harrogate & Ripon Beekeeping Association.

The article elicited the following response from an Essex member -

WINTER FEEDING MISCONCEPTIONS

The extraordinary collection of assumptions / recommendations have neither foundation in research nor in practice and should not be allowed to stand without challenge. The author dismissed as needlessly weak the "widely quoted" standard mix of 2 lb sugar to 1 pint (1.25 lb) water.(61.5% sugar). Then, quite by chance, the mix was swiftly supported in a *beebase* email warning of possible starvation *(see opposite page - Ed).* That support stemmed from the long standing knowledge that a 61.5% sugar solution is the strongest that a bee will ingest directly without need of dilution. Offering the bees a stronger solution of 2 kg sugar to 1 kg water (67%) is self-defeating, simply causing them to expend extra time and energy on pre-dilution to the standard mix before ingestion.

Hot tap water gives enough heat to achieve full solution of the standard mix.; subjecting the sugar to boiling water is not only unnecessary, but also unwise because it may cause unwanted adverse chemical changes as well as posing the risk of a scalding accident.

The author, from the Harrogate (Yorkshire) BKA, is blithely confident that air temperatures in Harrogate in September will not fall below 15^{o} C (even at night?). Be that as it may, perhaps he need not worry, for the bees will be busy reducing the sugar concentration to the standard mix unbidden.

It is noteworthy that his recommended sugar concentration (67%) is the same as that of the stored syrup in the comb. Thus he appears to regard the whole process as nothing more than an exercise in transportation, completely missing the point that the bee, in the course of ingesting the syrup and then regurgitating it drop by drop, will have added enzymes from its own glandular system to reduce much of the original sucrose to its component mono-sugars, mainly glucose and fructose, which the bee can then directly metabolise to obtain energy. After regurgitation each droplet is then fanned to produce the required concentration for storage.

David Hill -Southend & District Division

AUTOMATED EMAIL received from National Bee Unit on 28 August 2018:

Dear …….

Bee Inspectors across the UK are reporting that many colonies look low on food reserves and are in need of food, especially those colonies where honey has been taken off and replacement food been given back. The sugar syrup should be made by using 1Kg of sugar to 650ml of warm water or commercially ready-made bee syrup used. Please monitor your colonies throughout the autumn and feed as required to ensure they do not end up starving. As a rule, standard full size British National colonies will need around 20-25kg of stores to successfully overwinter.

For further information, please see the 'Best Practice Guidance No.7 - Feeding Bees Sugar' viz:

> **Making Sugar Syrup**
>
> To make sugar syrup use white granulated sugar. With modern production methods it makes no difference if it was sourced from cane or beet.
>
> The syrup should be made up in the proportion of 1kg of white granulated sugar to 630ml of water or 2lb sugar to 1 pt of water. There is no need to boil the mixture but using hot or warm water helps.

Other mixtures/methods from around:

Welsh Beekeepers:	Make the syrup with one electric kettle full of hot water to 3 x 1kg bags of sugar. *(Ed. What capacity is a 'kettlefull?)*
West Country Beekeepers:	**Thick Sugar Syrup**: 1Kg of granulated sugar to 630 ml of water (2lb sugar to 1pt of water) **Thin Sugar Syrup**: 1Kg of granulated sugar to 1L of water (2 lb sugar to 2pt of water)
USA Beekeepers:	The syrup used in fall and winter should be in the proportion of two parts sugar to one part water by either weight or volume.

Unfortunately, feeding is now complete for most. Some beekeepers feed a more concentrated mix in the Autumn and a thinner mix in the Spring, so there is clearly some variation - as it seems in all things relating to beekeeping. Ed

Martian Laser can Detect Fake Honey

A laser tool funded by the European Space Agency to measure carbon on Mars has been used to detect fake honey.

The counterfeit goods trade might more commonly be associated with handbags and watches, but it turns out that the world of honey trading is also a murky one, riddled with smuggling and fakery. According to a US Food Safety News investigation, more than a third of honey consumed in the US has been smuggled from China and may be tainted with illegal antibiotics and heavy metals. To make matters worse, some honey brokers 'create' counterfeit honey using a small amount of real honey, bulked up with sugar, malt sweeteners, corn or rice syrup, "jaggery" (a type of unrefined sugar) and other additives - known as honey laundering. This honey is often mislabelled and sold on as legitimate, unadulterated honey in places such as Europe and the US.

Thanks to a new laser "isotope ratio-meter" developed at the Rutherford Appleton Laboratory (RAL) at Harwell, this fake honey can be detected. The device has small, highly accurate lasers designed to be sent into space to look for trace amounts of gas in very small samples. The laser has an adjustable optical frequency or 'colour' that can be beamed at a gas sample and the frequency adjusted until that specific to a particular gas is reached - the light is then partially blocked. *"Each molecule and each of its isotopic forms, has a unique spectrum. If, on the other hand, you know what you are looking for, you can simply set the laser to the appropriate frequency,"* explained Damien Weidmann, Laser Spectroscopy Team Leader at RAL Space. The relative levels of different isotopes can reveal information about the history of the formation of the molecule. Weidmann is keen to use the system to examine the Martian atmosphere. A bacterial origin would indicate life had occurred on Mars. The same tool can be used to scan the carbon dioxide released from burning a few milligrams of honey, to see whether it is a cheap substitute or not.

RAL Space has teamed up with UK Company, Protium MS to develop a small portable device that can be used to probe for counterfeit foods - not just honey. This will provide a carbon isotope fingerprint that shows the product's provenance. David Bell, director of Protium, explains that honey is a *"classic example because it's expensive to buy, but it is easy to make a counterfeit product that looks very similar using sugar instead of bees."* Laser analysis of this sort can then match the honey to the flowers of a specific geographic region.

Ipswich & East Suffolk BKA via eBees

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