Beetalk

General info and news about bees
June 2018

Hello and welcome.

Beetalk is a compilation of news and views from across the bee keeping world.

Its not affiliated to any beekeeping group so you wont get things like the next meeting association events and what we are doing and such like.

We hope that the articles provided will be useful to anyone interested in the a rewarding hobby and in some way I also hope that you may gain some pleasure in reading some of the article that are included.

Also I intend to include articles that may be helpful to anyone new to the hobby.

Being based in Lancashire it would be great for any contributions from Beekeepers from the county. But as stated above, please nothing about your association or group.

Hope you enjoy.

Michael Birt

Editor

If you have any articles that you think may be useful to have included in Beetalk.

Please e-mail them to the editor

at

birt_192@hotmail.co.uk

PLEASE SUPPORT THE FOLLOWING.

NORTHERN BEE BOOKS

OVER THE PAST TWENTY YEARS OR SO WE BEEKEEPERS HAVE HAD TREMENDOUS SUPPORT FROM NORTHERN BEE BOOKS. WE WOULD LIKE TO THANK THEM BY PUBLICISING THEIR WEBSITE WWW.BEEDATA.COM

THE POSTAL ADDRESS IS:
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UK Honey Labelling Regulations

Below is our simple advice on honey labelling. For more detailed information - go to the website of the Food Standards Agency. www.food.gov.uk

1. The Word "HONEY" is required.
2. The weight must be on the label - we will ensure it is the legal size and format.
3. You can specify the area where the honey is produced. For example, Lincolnshire, Forest of Dean, Scottish Borders.
4. You can specify the type of honey. For example, Heather, Borage. The honey must be at least 75% of that particular type.
5. If you are selling the honey, you must have your name and address on the label. It does not need to be complete but you should be able to be found from the information.
6. If you are selling the honey through a third party, you must have a lot number.
7. New for 2003 You must have a best before date on the jar. We suggest 2-5 years from now.
8. New for 2003 You must have a country of origin on the jar. For example - Produce of England, Product of Scotland, Harvested in Wales. Adding the country to the end of your address is not acceptable.

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New comb versus old comb—one man's view

A recent piece in the BBKA news, "Old comb versus new comb" has triggered me into sharing some of my thoughts on comb. My background is in deep level mining and in that environment one learns quickly to accept nothing at face value. It seems as though this may be the reason why I've become cynical about much of the equipment that is currently hawked to the 21st century bee keeper.

There appears to be plenty of evidence to suggest that current pesticide and varroacide practices lead to an unhealthy build up of unnatural substances in beeswax. Therefore, I find it entirely logical that brood comb should be regularly removed. The question is what to replace it with. The policy of recycling wax in foundation must compound the issue of contaminant build up. I also feel that the uniform pattern of foundation is an un-natural demand to enforce on our bees.

Bees draw worker cells of differing sizes when allowed to. They are also happy to expend valuable resources on producing a much larger ratio of drones, than foundation framed bee keeping allows. Although the reasons for this are not yet understood I am sure that after 120 million years the bees have very good reason to do so. My other aversion to foundation is the size of the embossed pattern. A well known supplier is currently selling foundation with a cell width of 5.7 mm. I transferred a nucleus of bees from such foundation into a top bar hive this summer. The cell size in this hive has already regressed to an average worker cell size of 5.3 mm. Others have reported cell size variation as small as 4.8 mm. The imposed larger cell size is not only unnatural, but also has an impact on the laying space available to the queen, reducing it by as much as 35% and potentially leading to in-creased swarming. I would prefer my bees to have clean wax and a cell size and drone ratio of their choosing. This may well re-duce my honey harvest, but I am sure the bees will be far healthier and contented.

I find horizontal top bar hives time consuming in terms of returning the bars after inspection without any —fatals‖ and also the large lugs are cumbersome, so I decided to experiment on a National hive. In deciding to dispense with the foundation I found that, with sensible frame handling, I no longer needed wire or fishing line support within a frame.

Dispensing with wire then allowed me to dispense with expensive and overcomplicated frames, as no allow-ance is needed for wire expansion at the bottom of the frame. I placed a narrow cedar top bar on one side of the brood nest and a frame of foundation on the other. The bees drew a perfect rectangular comb, which I could easily remove, and ignored the foundation.

I repeated the process by introducing another cedar bar on the other side of the brood nest and again the bees showed their preference over the foundation. Although I found no issue with comb being attached to the side of the brood box, I think this was luck and so in the new year I will use a simple top bar with 10 cm short sides. This will give me combs which can still be easily examined, enable vibration communication, are drawn as the bees desire and are a lot cheaper!

I intend to have a simple framed hive next to a traditional framed hive at several apiaries and look forward to reporting on results in terms of bee health, varroa numbers etc.

A Volumetric Approach to Swarm Control

A single National brood chamber with 11 deep frames presents approximately 55,000 cells at 25 per square inch. We are told repeatedly that 55,000 or more is the number of adult bees which must be accommodated at the peak in July. As an adult worker measures 1/2"x 1/4" x 1/4", each requires 1/8 sq in of standing room i.e. no more than 8 per sq in, or about 1/3 the number of cells per sq in.

It follows that if the brood box is 9" deep and full of brood, an overall height of 27" is required for an equivalent number of adult bees. This height can be achieved by adding 3 supers (6"), but these make no provision for the adult bees to move around overnight when the foragers are back home. Hence, four is probably a better estimate of the number of supers required by mid-summer simply to accommodate the adult bees in reasonable comfort, regardless of the amount of nectar/honey to be stored.

Since overcrowding is cited as one of the factors involved in swarming, adding supers simply to provide space for the workers is recommended. This provision requires a greater investment in shallow supers than is necessary for the amount of surplus in a normal season but allows for say 120lbs of surplus in bonanza years when swarming is most likely to occur. On balance it is better to be faced with the need to extract part-filled supers in normal years than to be left with empty supers because a swarm has absconded.

I am not suggesting that the above is sufficient in itself to prevent swarms but it does allow for part of one's anti-swarming measures to be quantified.

To continue, readers will be aware that one of the perennial topics in beekeeping is whether or not the BS National brood box is big enough. As noted above it contains circa 55,000 individual cells. The text books tell us that a young queen lays 2,000 eggs daily while the colony is expanding in Spring. That being so 42,000 cells are required for each cycle of worker brood, leaving 13,000 cells (the equivalent of 2.6 frames or 24% of the total) for drone brood, pollen and nectar/honey. My experience tells me that a quarter of each frame is amply sufficient overall for drones and pollen, and if space in the brood chamber becomes limiting the bees will put any excess of honey "upstairs" where I preferred it to be to maximise the eventual surplus.
I personally think the National BC is big enough unless one is working with prolific queens bred in warmer climes. My preference was always for locally bred queens derived from strains adapted to the area, and whose thriftiness was an important characteristic for their survival in poor summers and/or harsh winters.

The twin parameters a) that the queen lays 2,000 eggs per day and b) that a fully developed colony comprises 60,000 adults, are embedded in beekeeping folklore, but I do not know the basis for them. Can anyone give references to the original studies on which they are based? If they should turn out to be not well founded, not only might this article have to be reconsidered from a fresh perspective, so too might some of our basic assumptions regarding colony dynamics.

To continue the mathematical/theoretical approach: a brood cycle of 42,000 implies an adult population eventually of at least 84,000 which would require at least 7 supers + single brood box (working on usually accepted figures) to contain them—just to contain them, nothing else. In practice, it seems quite clear to me that these theoretical rates of egg-laying are never kept up for a great length of time, but represent a maximum peak, usually in May.

A novices “A Bit of a Do”.

As a new beekeeper (one whose first year keeping bees has been nothing but educational) I was really looking forward to my first Bit of a Do. Would I finally learn what was the right way to keep bees? Had I chosen the right equipment for my apiary? And what bits of equipment was I missing? With all these and many more questions swirling around I approached my first conference with anticipation and awe. I was prepared to be astounded. I was not disappointed. For those of you who are experts and long standing apiarists you will not be amazed to understand that I did not get answers to my questions because there is no right way. But more of that later.

The conference itself was well organized and the venue was an excellent choice as there was a good amount of space for all the exhibits, trade stands and short sessions; as well as the auditorium for the keynote speakers and quest!on and answer sessions. As a first timer I didn’t want to miss anything so I made sure on arrival to put my name down for each of the short sessions. These were all on different aspects of varroa monitoring and control, great for newcomer and expert alike. I was also lucky to find the bookstall before the opening speech and so found !me to browse amongst the large selection of books and leaflets. Due to so much choice I didn’t manage to spend enough !me with the skep maker and never found the gadget room but that will be remedied next !me if they are included again.

The keynote speaker was Graham Royle whose first session “Bees through the Looking Glass” on microscopy was a little challenging to a newcomer but valuable nevertheless, as getting exposure to this aspect of beekeeping had not come my way before and it certainly got the grey cells working overtime. His afternoon session “If Heath Robinson had been a Beekeeper” was very light hearted with a number of chuckles. The closing question and answer session was informative and entertaining; questions being handled with courtesy and good humour with a good deal of audience participation.

The things that I learnt: - Beekeepers are friendly, passionate people who are not afraid to tell the bee inspector that they know better. Even once you have kept bees for many years you will still disagree with someone equally skilled about how to manage your colonies, but you can do it in an entertaining, robust and friendly manner. No two beekeepers agree on what is the right equipment for a beginner, but once you have started with one type of hive all agree you should keep with it so you have inter changeability of equipment. If you want to overwinter a colony as a brood and a half, and want to put the super under rather than above the brood box, there will be at least one beekeeper who will agree that it is the right thing to do. If you find a battered traffic cone by the side of the road which will not be of any use in its original function – rescue it, you can use it as a funnel to drain wax. Oh and your varroa mesh floor should be at least two inches above the inspection tray so the little beggars that fall down and are still alive can’t get back into the hive – I still haven’t worked out how to fix that in my hive. And lastly don’t arrive at the last minute, either at the conference as there is lots of things to look at before the formal start, or at the short sessions or you could end up perching on a windowsill!

We all have to start somewhere.

ED

I know it's a bit early But something for you to think about as September will soon be here.

Having completed the feeding of your honeybees by the end of September it is time to think about Winter protection for you hives.
The hazards likely to be encountered are
(a) hive roofs blown off
(b) hives blown over or knocked over by
cattle or flood water
(c) woodpeckers and, if the weather is still mild, (d) wasps
(e) ageing hive stands.

High winds can blow off shallow roofs quite easily, and you don't need a tornado to do it, whereas deep roofs, 15 cm or more, usually stay on. In any event a brick or two on the hive roof will help stop this.

It is prudent to not store supers above the brood chamber crown board throughout Winter months as gusts of wind can blow them off and even blow the hives over. A number of beekeepers put wet supers back on the hives and over the hole used for Porter escapes and are tempted to leave them there. It is best to store them separately in the apiary or bring them home in the case of an out apiary once they are dry.

Woodpeckers, usually the green ones, make holes in the hive woodwork during periods of frost when their normal food (ants and chafer grubs) in the ground is inaccessible because of hard frost. Sometimes these holes are large enough to allow later access for rats and other vermin and further damage then occurs. In most cases the bees seem to survive the woodpecker attacks but do succumb to vermin.

If your apiary is on the edge of woodland and under trees it is prudent to cut off boughs that may later blow against the hives. Any fencing supports should also be examined in order to make sure cattle or other animals cannot get near enough to rub themselves against the hives.

Protection against woodpeckers can be achieved by making a cage of wire netting to place over the hive so that it is completely covered. A couple of bricks on the roof will stop the netting touching the roof and thereby prevent the woodpecker making a hole through the roof. Alternatively, sheets of plastic can be pinned around the hive. Do not leave it to flap against the hive as this could disturb the bees.
Woodpeckers have been known to make holes in the wooden floor from underneath. However, it is a small risk that could be avoided by standing the hive on a metal sheet, or over wintering on a mesh floor; or just putting a mesh floor underneath
the wooden floor.

Flooding of apiaries can occur but the likelihood of it affecting the hives is minimised if they are on stands 40 cm (16") high. Damage is more likely in the Summer with flash flooding and it has been known for brood chambers to be flooded and the queen survived by the fact that there was a space of roughly 5 cm below the queen excluder that contained air. It is surprising, perhaps, that bees seem to tolerate such adverse conditions.

Wasps are a problem from the end of July until the end of November and they try to get into the hives through the entrance block if you are a beekeeper who keeps the entrance blocks in the year around. With the entrance block in position
the access for bees and wasps is via a long slot or a short slot … the choice being made by rotating the entrance block through 90°. Alternatively, you may be using a Gilbert Louvre Even so, this entrance may need to be reduced further by the insertion of a small piece of plastic foam (rubber foam) so that a smaller entrance can be properly defended. The overall
consideration is to match the entrance to the strength of the colony. A nucleus requires just room enough for one or two bees at a time to enter. It takes something like four honeybees to keep a common wasp out. Wasp traps should be kept adjacent to the hives until the first frosts.

Ageing hive stands can become unstable if the legs rot and it is advisable to check these before the winter gales.

This may be of interest, it's a beehaus at a museum village in southern Bavaria. I believe there are 100 'hives' in it. but as you can see there are no bees.

D.D.T **d**ichloro**d**iphenyl**t**richloroethane

Extract from the May 1946 edition of BEECRAFT

In view of the wide publicity which has been give to DDT and its toxic effect on bees, the statements made in our information pamphlets about our Ditrene products will no doubt be of interest to you, but in general we state that DDT can be used on orchards with safety, providing precautions are taken in the same way as they are with lead arsenate, i.e. spraying well before the blossoming period of three weeks to a month, and avoid spraying when there are flowers or weeds in flower, underneath the fruit trees at the time of spraying. In other words, if dandelion or daisies are in bloom at green bud stage when DDT preparations would normally be applied against weevil, an after spraying or hosing of the ground with water would be a help or preferably the grass and flowers should be mown a day or two before spraying. – MESSRS. TECHNICAL PRODUCTS LTD January 17th 1946.

Extract from Wikipedia

In 1962, *Silent Spring* by American biologist Rachel Carson was published. The book catalogued the environmental impacts of the indiscriminate spraying of DDT in the US and questioned the logic of releasing large amounts of chemicals into the environment without fully understanding their effects on ecology or human health. The book suggested that DDT and other pesticides may cause cancer and that their agricultural use was a threat to wildlife, particularly birds. Its publication was one of the signature events in the birth of the environmental movement, and resulted in a large public outcry that eventually led to DDT being banned in the US in 1972.

Lemon balm

Researchers have been evaluating the effectiveness of lemon juice as a treatment for varroa.

Egyptian agricultural researchers M.F. Abdel-Rahman and S.H. Rateb mixed pure lemon juice with 1:1 (weight/volume) sugar syrup in concentrations of 10%, 25%, 50%, 75% and 100% and the solution was applied at the rate of 5ml per seam of bees. Colonies were treated 5 times at 6 day intervals. The success rates were 32.5%, 40.5%, 82.9%, 84.4% and 86.6% respectively.

Polish beekeeper Dominik Ptak reported that he had tried the method in Poland and reported achieving a 90.5% control with a single application. He says that the mixture must be lukewarm and freshly made; as with oxalic drip treatment the colonies should have little brood. So this is a November/December treatment.

For more information and discussion, go to:

www.buzzaboutbees.net/support-files/lemon-juice to-counteract-varroa.pdf

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BEEKEEPING GLOSSARY

BROOD: Typical beekeeper's facial expression when s/he realises that a large proportion of the bees on the veil are clinging to the inside, not the outside.

COMB: The sticky, crumbly stuff which is spread over your arm from elbow to fingertips during hive inspections.

DRONE: The male, recognised by his squat bottom and large eyes. Named after the noise he makes at beekeeper's meetings as he tries to discuss the merits of various types of smoker fuel.

HIVE: With an old tree and a chainsaw you can make an adequate beehive in twenty seconds. Alternatively you can purchase a "DIY Hollow Tree kit". These kits contain 200 beautifully made wooden parts; a few of which actually fit together.

HIVE ROOF: Contraption made of wood and metal designed to lie in the grass ten yards downwind of each hive.

HIVE TOOL: Cunning little lever which will remove neatly all the frame top bars, whilst leaving everything else perfectly stuck inside the brood box.

HONEY: Mythical substance said to come from beehives.

NEIGHBOURS: For legal reasons I am not able to mention the nice people who used to live next door.

PROPOLIS: When a hive tool is stuck to one hand, a smoker to the other, and your wellies are glued together, say out loud, "Ah, this is the wonderful panacea that is priceless!"

QUEEN: Mythical, invisible creature said to live in beehives.

QUEENLESSNESS: Natural state of a beginner's colony; no cause for alarm.

SKEP: One legged dancing movement to be observed when bees find the gap at the top of your wellies.

SMOKER: Produces more smoke than the 'Flying Scotsman' when the bees get annoyed. At this point a hidden microchip and secret circuit cut in to extinguish all smoke instantaneously.

STING: The bee's way of saying, "Good morning!" As they are naturally friendly creatures they tend to say, "Good morning!" frequently.

SUPER: You well need six of these for every hive. Pile them on top, take some photos, then put them away 'til next year. Show off the photos modestly at beekeeper's meetings.

SYRUP: Spill this on your back doorstep so the bees know where to find you and greet you every morning.

SWARM: The noisy heaving mass of beekeepers clinging to the bookstalls at Stoneleigh.

UNITE: The technique by which two small queenless colonies are combined into one larger queenless colonies.

Gadgets to make your life easier...

At the Bit of a Do there were a number of gadgets displayed by their inventors. This was one of them which we felt you might like to see.

A FRAME FOR RECOVERING NATURALLY BUILT COMB

When a colony has built combs in an undesirable position or a derelict hive it was always a problem to easily rescue the brood combs. This frame device, which I have now been using for five years, enables the comb to be cut out and placed into the frames without the need to secure them in any other way.

e Frame one week later. Note the amount of emerg
Brood which would be lost without Comb recovery

Any size of frame can be used to suit the Beekeepers own hives.
The combs can be fitted in any position but the upper-most combs should, if possible, be touching the top bar. The other pieces of comb are placed close to each other so that the bees can join and secure the whole frame of wax with brace comb.

Within a week the frames of comb will be secure enough to enable the Bee-keeper to manipulate them for inspection.
The brood box can of course be completely filled using extra frames fitted with foundation, which when drawn can be used to replace the mesh frames as required.

The Frame when the comb was first fitted

The Frame one week later. Note the amount of emerged
Brood which would be lost without Comb recovery

Also the brace comb built by the bees is usually in drone cells so this can be culled to control the first flush of Varroa Mites in the recovered colony. So beware the Varroa Mite load in these combs can be heavy and will need early treatment.

INCIDENTAL BEE FACTS.

Compound eyes have c 6,900 facets.

Wings beat at c 30 beats per second.

Flight speed is c 25kph.

Fur gets a static charge which attracts and holds pollen.

Hexagon gives smallest circumference and gives maximum space for minimum material.

Angle of cells is 13d above the horizontal.

In the waggle dance, the angle to the perpendicular equals the angle to the sun. In that direction is the source being signalled.

A returning forager will also shake a non-forager to excite her. Forager holds the other bee with her two front legs and literally shakes her
In the dance, bees allow 1d west every 4 mins.

Speed of dance shows distance; faster means closer.

If a returning forager cannot find a receiving bee in less than 50 secs, she undertakes a tremble dance.

Bees on forage eat only enough food to reach the source and return.
3,500 bees weigh 1lb.

Natural mite drop / day - Infestation level
<1 = low
1-10 = acceptable
11-30 = approaching tolerance threshold
> 30 = liable to collapse

In order to find the daily mite drop, check the mite drop/week and divide by seven. The above figures are arbitrary, there are many variables, some colonies are more mite-tolerant than others.

Average colony collects p a 20 kg of pollen; 120kg of nectar 25ltrs of water and 100g of resin.

What makes a nurse bee a forager?

How does a bee know what job to perform and when to perform it?
Honey bee division of labour is characterised by a process in which bees do different tasks as they age, some three weeks as a nurse and some three weeks as a forager, a forager may revert to being a nurse be, but generally it is a one-way street.

I've always been interested in this behavioural switch point, the casual mechanism of forage initiation.'

In 2002 scientists from the University of Illinois published the first data to identify a causal role in foraging behaviour. The cause, it turns out, is a gene. Although the bee genome is one tenth that of homo sapiens, sifting through genes to find a master switch was a molecular tour de force.
The team streamlined the process by taking inspiration from the fruit fly, Drosophila melanogaster. Drosophila foraging behaviour comes in two forms; searchers over a large area (rovers) and searchers over a small area (sitters). These two behavioural forms, phenotypes, are determined by the fly's possession of one of two genotypic forms called genotypes.

Neither form is better than the other. Patchy food distribution favours rovers even if there is a higher cost of predation; but in habitats where food is evenly distributed, or when population levels are low, sitters do better. Drosophila has evolved two genetic forms of a gene; these two forms code for two different foraging behaviours, and these two behaviours are useful for two different ecological situations.

Could honey bees do something similar?
The catch, of course, is that all bees at different times in their lives may be either a bee-rover or a bee-sitter, so it cannot be that there are two different genetic forms in the same bee.
In Drosophila foraging behaviour is determined by which genetic form the fly carries, in honey bees it is determined by how hard the gene is working.

The gene is made at different levels and this determines foraging likelihood. Foragers possess two to ten times more of the gene product than nurses. But what if this is simply a function of age?
The researchers created bee colonies with a manipulated social structure. They removed all workers that were more than 21 days old, essentially removing the forager force. In the absence of foragers, some young workers began precociously foraging two weeks early. This meant that some colonies had foragers that were just one week old: the normal control colonies possessed age matched nurses that were just one week old. A huge increase in gene expression was occurring in the one week old foragers. Clearly this increase in gene expression is independent of age; but is it The Main Cause of foraging behaviour?

Causal factors must satisfy the criteria of sufficient and necessary.
For something to be necessary, when it is taken away, the behaviour ceases.

For something to be sufficient, it is enough to cause the behaviour.
The scientists tackled this issue by giving the equivalent of a molecular cocktail of the stuff that the gene is encoded to make, and young nurse bees began precociously foraging in a dosed dependant way; the more cocktail, the more they forage.

So they concluded that this gene -
specifically the amount of gene being currently produced - causally affects the transition to foraging

An Unusual Sting Remedy.

A couple of weeks ago, I was stung by both a bee and hornet while working in the garden. My arm swelled up, so I went to the clinic. The doctor gave me cream and an antihistamine. The next day the swelling was getting progressively worse, so I went to my regular doctor. The arm was infected and needed an antibiotic. The doctor told me - ' The next time you get stung, put a penny on the bite for 15 minutes'.

That night, my niece was stung by two bees. I looked at the bite and it had already started to swell. So, I taped a penny to her arm for 15 minutes. The next morning, there was no sign of a bite. We decided that she just wasn't allergic to the sting. Soon, I was again gardening outside. I got stung again, twice by a hornet on my left hand. I thought, here I go again to the doctor for another antibiotic. I promptly got my money out and taped two pennies to my bites, then sat and sulked for 15 minutes. The penny took the string out of the bite immediately. In the meantime the hornets were attacking, and my friend was stung on the thumb. Again the penny. The next morning I could only see the spot where the hornet had stung me. No redness, no swelling.

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Ragwort.

There was an interesting article in the Weekend Telegraph, back in August, about the spread of ragwort (*Senecio jacobaea*) throughout the country. Ragwort is unpalatable but toxic to animals, particularly in its dried state, in hay, therefore it is generally fairly well controlled on livestock farms. It is not a threat on odd corners of arable farms, or on council roadsides where it can flourish mightily. The trouble is, it spreads to where it is not wanted. In the 'old days', ragwort was automatically pulled up whenever a country person saw it, but no longer, it seems.

The active ingredients are pyrrolizadine alkaloids, (PAs) which accumulatively cause irreversible liver damage.

Other plants also contain this substance, notably Vipers Bugloss *Echium vulgare* . This is a real problem in Australia, as it is drought resistant and often the only green food around.for livestock. They call it Pattersons curse.

Honeybees do work ragwort, so is the honey likely to be toxic? This question of pyrrolizidine alkaloids was raised several years age, and there still seems to be no definitive answer.

A leading authority on ragwort toxins from Liverpool university will not eat honey from ragwort infested areas,(but how do you know, without doing a centrifuge test for pollen, whether your honey has this substance in it?). The article claimed that the food standards agency had no data on toxins in honey, but they have since issued a statement that as the levels of Pa's in honey are so low they pose no threat to health. I was never worried anyway!

As beekeepers, we have the advantage of eating our own honey and fairly knowing what goes well into it. Su-

The late flowering Ivy. Sometimes a lifeline for the bees. Wasps love it too

Pyrrolizidine alkaloids in honey and bee pollen.

A. Du Becke, G. Beckh and C. Lu llmann Quality Services International GmbH, Flughafendamm 9A, D-28199 Bremen, Germany

A total of 3917 honey samples and 119 ‗bee pollen' samples (pollen collected by honeybees) were analysed for pyrrolizidine alkaloids (PAs).
Some 0.05M sulphuric acid was used for extraction followed by a clean-up step by means of solid-phase extraction. Separation and detection was achieved by target analysis using an LC-MS/MS system.

PAs were found in 66% of the raw honeys (bulk honey not yet packaged in containers for sale in retail outlets) and in 94% of honeys available in supermarkets (retail honey). A total of 60% of the bee pollen samples were PA positive. The PA pattern was used to identify the potential origin of the PAs in honey, which was verified for the genus Echium by relative pollen analysis. The results give an estimate of the impact of PA-containing plants belonging to the genera Echium, Senecio and, to a certain extent, Eupatorium on PA levels in honey and can serve as a decision basis for beekeepers in order to find the most suitable location for the production of honey and bee pollen low in PAs.

A total of 94% of the retail honeys contain PAs, but in 88% of the samples the concentrations were below 50 mgkg-1 (including samples below the LOQ). Thus, consumption of one hotel serving of honey (20 g) would still meet the limit for phytopharmaceuticals of 1 mg PAs 24 day-1 (if not consumed for more than 6 weeks). The effect of blending is apparent when comparing PA patterns, concentrations and abundances in raw and retail honey.
Raw honeys (bulk honey not yet packaged in containers for sale in retail outlets) may differ substantially in PA pattern, concentrations and abundances. While the PA pattern of raw honeys from Central American countries is very similar, PA patterns in South American raw honeys show great differences due to available plants in the vicinity of the beehives, as could be indirectly verified for Echium species by relative pollen analysis (Louveaux et al. 1970).
European raw honeys generally contain much lower amounts of PAs and mostly PAs of group 2. Only Italian and Spanish honeys show higher amounts of PAs mostly of group 2, which are typical for Echium species. The presence of Echium pollen in samples with high concentrations of PAs of group 2 was verified by pollen analysis. The amounts of PAs found in some bee pollen samples could lead to negative health effects when these bee pollens are consumed, as consumption of only one teaspoon of bee pollen (about 5 g) may contain up to 189 mg of PAs, which is far beyond the existing German limit of 1 mg day-1 for the consumption of phytopharmaceuticals for not more than 6 weeks. Nevertheless, 40% of the bee pollen samples were PA negative.

Still, it needs to be kept in mind that only a limited number of PAs were analysed. Thus, there is the possibility that not all PAs present in honey and bee pollen were detected by using this target analysis. The results thus can be regarded as preliminary values, which are likely to increase with the number of Pas included in the target analysis.
If beekeepers avoid placing beehives in areas abundant in the above-mentioned plant genera as much as possible, a substantial reduction of the PA concentrations could be achieved. However, there are other PA-containing plants that may also contribute to the PA pool in honey and which were not considered in this study. The more that PAs are included in the analysis, the better the potential source plant can be identified.
This study is just a first step in identifying plants contributing PAs to honey and bee pollen and it can serve as a basis for further studies including a wider range of Pas.

From an article aimed at bee farmers, but will be of interest to the chemists among us. Obviously PAs are taken seriously in Germany. Ed

DOES KEEPING BEES ON COMB WITH SMALLER CELLS CONTROL VARROA?

The headline question has been debated for over ten years. The answer "yes" appears to have become almost an article of faith among the most convinced. Different research papers have appeared supporting either "yes" or "no", without either side landing a knock out blow.

A very recently published paper in Apidologie "Small-cell comb does not control Varroa mites in colonies of honeybees of European origin" by Thomas D. Seeley and Sean R. Griffin clearly gives its conclusions away in the title. The abstract reads:
"We tested the idea that Varroa destructor can be controlled in colonies of the European subspecies of *Apis mellifera* by providing them with combs built of small cells, in which immature mites might have difficulty developing for lack of space. We established seven pairs of equal-size colonies that started out equally infested with mites. In each pair, one hive contained only standard-cell (5.4 mm) comb, and the other contained only small-cell (4.8 mm) comb. We measured the colonies' mite loads at monthly intervals across a summer. No differences arose between the two treatment groups in their mean mite loads (mites per 100 worker bees or mite drop per 48 h). We suggest that providing small-cell combs did not inhibit mite reproduction because the fill factor (thorax width/ cell width) was only slightly higher in the small cells than in the standard cells (79% and 73%, respectively)"
Is this conclusive? I would judge not. The relatively small number of colonies used , and the phrase "equally infested with mites" both make me a bit doubtful.

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Timing It!

In the summer season, forager bees face difficult decisions. The blooming time of various plant species is distributed unevenly over the summer months. While in April and May e.g. rapeseed and fruit trees are in bloom, herbs like thyme and lavender take over later in the season. However, even during a single day, diverse flowers bloom at different times, and the nectar content varies over the day. Honeybees have evolved an accurate time sense to cope with this problem.

Honeybee foragers can determine the time of day with an accuracy of about 15 minutes. An experienced forager has learned when it is worth flying to a certain flower patch, and which flower depending on the time of day – to choose there. Even when the foraging bee discovers a novel patch of flowers, it can recognise the flowers worth visiting according to the time of day.

In order to discriminate between flowers, bees do not only use colour and scent, but also the shape of blossoms and whole plants. Bees can even identify blossoms according to abstract properties like central or axial symmetry and the number of petals and thus categorise them This ability enables bees to be flower-constant. Flower constancy is not only advantageous for the plant, because it is then fertilised with the correct pollen, but also for the bee, because she gets better in handling the blossom with each visit. Thus the foraging efficiency is increased, because the bee can extract nectar and pollen faster each time it visits.

All those cognitive abilities are facilitated by a 1 milligram pinhead sized brain. It permanently integrates visual, olfactory and tactile information, controls flight manoeuvres, navigates accurately over several kilometres and, simultaneously, memorises flower properties and recalls them at the appropriate time of day. The ability to remember a combination of 'what, where and when' is called episodic memory and was, until recently, believed to be restricted to mammals and food-caching birds. Honeybees are, so far, the only invertebrates in which this ability has been shown.

We are already taking advantage of the honeybee's learning aptitude: beekeepers mark their hive entrances with colours and shapes to help bees find the correct nest when many hives are close together in the same apiary. Behavioural scientists train bees to use colours, shapes and scents to navigate mazes, in order to learn about the bees' cognitive abilities. Not all bees are similar: some individuals are very clever and learn quickly, while others are forgetful and stubborn.

The article above was very kindly sent by Mario Pahl, a PhD student

Southampton scientists probe link between diesel and bee decline.

Possible links between diesel fumes and collapsing honey bee colonies are being investigated by scientists. A University of Southampton study will investigate whether tiny particles from diesel engines could be effecting bees' brains and their navigation. The three-year study will look into whether it is one of the factors affecting bee numbers. Colony collapse disorder has hit large numbers of hives in Europe and North America in recent years.

Diesel nanoparticles

Biologists, nanotechnology researchers and ecologists at the university will test the behaviour and neurological changes in honey bees when they are exposed to diesel nanoparticles. Ecologist Professor Guy Poppy said: "Diesel road-traffic is increasing in the UK and research from the US has shown that nanoparticles found in its fumes can be detrimental to the brains of animals when they are exposed to large doses. "We want to find out if bees are affected in the same way - and answer the question of why bees aren't finding their way back to the hive when they leave to find food," he added. Chemical ecologist Dr Robbie Girling, said: "The diesel fumes may have a dual affect in that they may be mopping up flower smells in the air, making it harder for the bees to find their food sources." The collapse of bee populations has been recorded around the world although extensive research has yet to identify the cause of the decline. Bees are estimated to contribute £430m a year to the

WASHING SODA – THE MAGIC SOLUTION!

When your grandmother did her spring cleaning or her laundry and used a fine white granular substance which was not soap powder? It is likely that she was using soda crystals or, to give them their technical term, sodium carbonate decahydrate ($Na_2CO_3.10H_2O$ for the scientists amongst us). These are a derivative of Soda Ash and dissolve really quickly in water (hot or cold). They have many uses around the house, in the garden and, as they are free of bleach, enzymes and phosphates, are just perfect for cleaning up around our bees.

Soda crystals have been used for generations to clean, loosen dirt, cut through grease, limescale and soap scum plus they soften hard water. As beekeepers we are surrounded by all the above in various forms if you consider beeswax, propolis which sticks to everything and general grubbiness surrounding our beehives, whether they be in the garden or a field, on a low loader or on the top of buildings. Beekeeping suits and overalls can be washed in the washing machine in the usual way. If you add a handful of soda crystals to roughly half the quantity of your usual detergent, you will find that any sticky propolis is removed, your suit will come up nice and clean AND you will lessen your environmental impact by reducing the detergent used as the soda crystals soften the local water. Less limescale deposit on the inside of your washing machine and pipes leads to a reduction in repair bills, so a big thumbs up all round to soda crystals!

Propolis gets everywhere in the summer months when it is warm. We find our gloves, hive tools, smokers and bee-suits covered in this marvellous substance, but how to remove it? A good soak in a solution of soda crystals will dissolve the propolis and any beeswax that has come with it (1lb:1gallon / 500g:5litres of water is an approximate ratio which gives an antibacterial pH of 13 so I am told). Adding a squirt of washing up liquid will help disperse any scum. Do please wear appropriate protective clothing including rubber gloves as the solution will be mildly corrosive and do not use anything made of aluminium as the soda crystals solution will attack the metal, pit it and ultimately eat their way through.

Soda crystal solution is ideal to disinfect your hive tool(s) between apiaries or between hives – best to keep it in a plastic container, an ice cream tub or a bucket with a lid. You will find that the Association tools are kept in such a way. The solution should get changed every fortnight or so to prevent re-spreading the deposit. Try not to get the soda solution on your hands as it might irritate – there are plastic inspection gloves available if you need them. The use of a nylon scrubbing pad will not scratch your hive tool and will help remove any deposits.

This same mix can be used to clean all the parts of the hive too. Brood and super frames, when stripped of their foundation and comb, can be soaked in the solution to remove the old wax and propolis and a gentle scrub with a cheap washing up brush will complete the job. After soaking the frames, rinse them in fresh water and hang them up to dry. Excess soda will be absorbed by the wooden frames and as they dry a white fluffy dust might appear, especially on the exposed ends. Soak the frames in diluted white vinegar and the soda will be neutralised. Wooden floors and crown boards can be given a good scrub with the soda solution and then scorched with a blow torch. Polystyrene and plastic hives can also have a good scrub down with the soda solution, but don't scorch these ones!

Your smoker can also be given the same treatment, but keep the bellows clear of the liquid. Put plastic queen excluders in a hot mix, it will bring them up clean and spotless as they clearly cannot be flamed like the metal ones. Make a point to clean seasonal equipment like bee escapes, mouse-guards and super frames as soon as the items are removed and scorch wooden parts (after a good disinfect if required or a good scrub down with your soda solution). Do not store dirty equipment, it is not worth it and you may need it sooner than you imagine!

If, like me, you manage to deposit honey in the strangest of places when extracting, or if you use a hot air gun to uncap your supers and those small melted dots of white wax fly around the room, a hot soda solution will clear it all up in no time and clean the floor at the same time – not recommended for waxed floors though, as the wax finish will be stripped off. Vinyl or ceramic tiles will clean up beautifully and you could give the grouting a good going over with an old toothbrush at the same time! The kitchen sink will gleam as grease, fat and wax will just disappear with a soda crystal solution rub over and a hot mix flushed down the drain will keep the pipes clear of blockages and fresh(er) smelling. Talking of smells – you can take a strong soda solution to your dustbin (good idea to do this before the summer..) to loosen and remove dirt, grime and sludge – good for the inside of water butts too.

The deposits from a melted beeswax candle on a favourite table cloth or item of clothing can be removed with an overnight soak (check washing labels first though) and the wax will be removed without damaging the material by scraping, scrubbing or using a hot iron and brown paper.

There are plenty more ways to use these magic crystals. We use them for cleaning paintwork in the house, cleaning windows, glassware, the barbecue gets a good going over before it is first used in the summer and mopping over the porch floor with a hot solution brings it up beautifully. Old fashioned maybe, but our grandmothers definitely knew best!

Holidays

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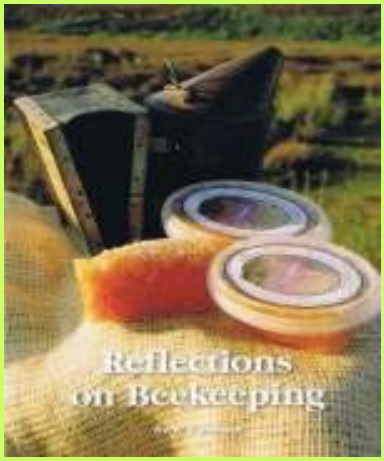
Accommodation comprises of 3 double bedrooms and 1 single bedroom. Self catering with meals can be arranged if requested. Guaranteed no Internet, no TV, no en suite bedrooms, no discos and frilly duvets- just the sounds of birds, cockerel alarm call and bees. Bring your own veil and walking boots for exploring the countryside.
Price per week 650 euros. Short stay B & B @ 30 euro per night
Interested, need to know more ring Jenny on 0039052576169

Book Review

Michael Birt



REFLECTIONS ON BEEKEEPING by W.S. Robson,
Northern Bee Books ISBN 978-1-904846-82-6 £10.95)
This is a sort of 'commonplace book' more than an ordered text, as will be confirmed by a glance at the index. It is a small book of 64-pages recounting milestones in the life of the author, WS Robson, and his family in the Borders. It contains much advice gleaned from generations of a beekeeping family. Although experienced beekeepers may dismiss some of this book (particularly the Glossary) they could still be amused by the anecdotes of this well-regarded commercial beekeeper (and may well settle down by a warm fire on a winter's evening to read this volume and take a dram to his memory!) Recommended as a Christmas present for someone who does not want a textbook but