Beetalk

General info and news about bees
September 2017

Hello and welcome.

Beetalk is a compilation of news from across the bee keeping word.

Its not affiliated to any beekeeping group so you wont get things like the next meeting 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 we also hope that you may gain some pleasure in reading some of the article that are included.

Also we 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.

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

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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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Topical Tips

We are now at what I consider to be a significant crossroads in the year. The honey gathering season is finished, apart from the odd minor source, and we now have to prepare our bees for the coming winter as a matter of urgency. What we do in August will have a major impact on our overwintering success - or lack of it.

In order to overwinter successfully we need young, disease-free bees, sound hives and suitable feed. Sounds easy, but achieving those conditions does require us to take action at the right time:

We must remove the crop as soon as possible.
We must ensure that our colonies then have sufficient food so that they carry on producing new bees - failure here can be disastrous.
We must treat our bees for varroa in **August** in order to produce clean bees to go into winter; delay on this point will leave us with diseased bees that will die during January and February.

At the same time, we must keep a watchful eye on the wasp situation so that our colonies are not severely damaged before winter arrives. Space does not allow great detail, so I am going to list what I hope are some useful tips. If you use the search box on the home page of the website, you will find greater detail on many points that we have covered before.

Removing honey:
Remember that honey does not have to be capped; some cells will not be capped just because they are not full. Hold the combs horizontally and give them a sharp downward shake - if nothing comes out then they are fine to take. Remove the crop in the morning; the bees will then have had all night to ripen any honey gathered the previous day. Use minimal smoke and try not to smoke the supers at all - the ash from smokers is almost impossible to filter out.

Extracting honey:
Make sure that your extracting room is secure or you may have large numbers (**thousands**!) of bees arrive to reclaim, and wasps to steal, the honey. If this happens then you will never make the same mistake again!
When extracting you **will** drop spots of honey and bits of propolis on to the floor. Honey can be removed easily, propolis can not. Cover the floor before you start (sheets of thick cardboard are good, newspaper tends to stick to your shoes). Keep a dedicated pair of shoes to walk on the cardboard and step out of them on to the clean floor when you have finished; that way you may avoid a divorce!

Returning wet supers
This is best done at dusk to prevent robbing. Put the wet supers **under** the crown board to avoid bees suffocating in the confined space between crown board and roof; you can move them up when they are clean.

Robbing
Work quickly and keep inspection time down. Robbing has to be seen to be believed and can result in massive losses of bees.

Varroa treatment
Whatever treatment you choose to use, get it started as soon as you have removed your honey.

Feeding
Before you feed, check that the colony is queen right. There is no point in feeding a queenless colony unless you have the means to requeen it; if not, then it will have to be united and the combined colony fed.

Queen cells
Another annual plea: if you find queens cells in a colony now **do not remove them**. The colony is superseding its queen and will not swarm. If you remove the cells it is likely that it will go queenless and die out.

Wasps
Wage war on wasps. Destroy nests, put out well designed traps, and reduce hive entrances as necessary - even down to a single bee space if you have a small colony, e.g. a mating nuc. Block up any small holes in the hive where wasps can get in (they can get through remarkably small cracks); we have found that a simple way is to scrape some wax from the top bars of frames and use this as putty to block entry.

The National Bee Unit has an excellent webpage on preparation for winter.

A Bees Brain.

Michael Birt

In spite of their small brain sizes (about one cubic millimetre), honey bees are very smart, with a remarkable ability to learn and recall things very quickly. Their brains are about 20,000 times less massive compared to human brains, and contain less than a million neurons, whilst our human brain has around 80 billion neurons. However, the honey bee brain is actually ten times denser compared to a mammal's brain.

The honey bee brain has an oval shape and is about the size of one sesame seed. The brain is a very sophisticated sensory system which gives them excellent sight and smell abilities. Their small brains are able to make very complicated calculations on distances and optimise route plans for different locations.

How do honeybee brains compare to the fastest supercomputers we have today?
Our fastest computer can process one billion computations per second. A honey bee brain can process one trillion computations per second! But what is the contribution of instinct, pheromones and automatic behaviour? It is true that some bee behaviour is inflexible with instinct guiding their response. But scientists do not fully understand honey bee learning and decision making or what it is that triggers their responses.

Bees learn from older bees how to do some hive jobs. They also use what they learn from experience to decide how to respond in the future. They utilise symbolic communication that is very close to human communication. Bees form some lifelong memories. They know how to conserve valuable energy by hanging almost motionless together in a swarm. They remember, organise their decisions, and process how many landmarks they pass during foraging flights.

Honey bees display fifty nine distinct behaviours that scientists have classified; which compares well with the widely recognised as highly intelligent dolphins, which have only about twice that many at one hundred and twenty three.

One third of a honey bee brain is called Mushroom Body Neurons. This is largely undeveloped in a house or nurse bee and until the bee starts to forage. Then this brain area develops rapidly and is used in critical memory storage. If the hive has a shortage of foragers, some of the nurse bees will switch jobs and become foragers. This job transition, whether triggered by age or social cues, involves changes in thousands of genes in the honey bee brain; some genes turn on and others turn off. It actually allows bees to learn and utilise additional brain power to perform very complex foraging tasks for nectar, pollen, water and propolis.

Bees must make flying decisions, weather condition decisions, visual, scent tracking and tactile decisions. They share perfect directions with their fellow workers, give and follow complex directions the first time, deal with bee enemies and unexpected, unfamiliar situations. Last of all; decide when to sacrifice their life for their colony!

If foraging bees perceive a danger at the location they are foraging, and upon returning to the hive find another bee communicating that location in a ‘waggle dance’, the bee that knows that there is danger will give a ‘stop signal’ by buzzing at 380 vibrations/second and butting with its head the waggle dancing bee who will immediately understand and stop dancing. No more bees will go to this location.

Their overall ‘intelligence’ benefits the colony. Decisions are made through learning and experience. The process where a swarm reaches consensus and selects their preferred new nesting site from the various reports of the ‘scout’ bees is a complex decision making process. Research in Australia has demonstrated that they can recognise different colours, and then use their memory of these colours to find and guide their way through a maze. Scientists are still discovering how honey bee brains works - the closer they look, the more amazed they become.

BACKYARD BEES OF NORTH AMERICA

Bee Intelligence, Sleep and Memory.

Intelligence:

Research has provided insight into some stunning cognitive capabilities for such a tiny brain, as well as some especially fascinating anecdotes that liken bees to humans. For example, just like the human capacity to recognize faces, honeybees show the ability to discriminate between two different human faces. A major feature of this trait in humans is that it breaks down when the face is inverted 180degrees. This same feature was observed in honeybees. Further, bees can count up to four objects when they are encountered sequentially during flight. It appears that bees can navigate to food sources by maintaining a running count of prominent landmarks that are passed en route, provided this number does not exceed four.

Sleep:

Children often ask what bees do at night, wondering if they are always busy doing something, or if they too idle sometimes in front of the TV. We know from ancient times that the sleep of the labourer is sweetest. Accordingly, honeybee foragers are among the first invertebrates for which sleep behaviour has been described. Foragers have strong circadian rhythms; they are active during the day and sleep during the night moving through three sleep stages. However, young bee's exhibit sleep behaviour consisting of the same stages as observed in foragers yet pass more frequently between the three and stay longer in the lightest sleep stage. These differences in sleep architecture represent evidence for plasticity in sleep behaviour in insects. The harder they work - the sounder they sleep!

Memory:

During evolution, honeybees have developed sophisticated sensory systems and learning and memorizing capacities, essential mechanisms that do not differ drastically from those of vertebrates. To forage successfully, a bee has to learn and remember not only the colour and shape of flowers that contain nectar and pollen, but also how to get to them. Since the species of flowers that are in bloom in the morning are likely to be replaced by a different species at a different location in the afternoon, the bee has evolved an impressive ability to learn and memorize local features and routes, as well as the time of blooming, quickly and accurately. Thus, having found a nectar-bearing flower at a particular time on a particular day, a forager can remember the task and the time at which it was completed, and visit the flower at the same place and time on the following day. The time sense of the honeybee can modulate their response to a local stimulus according to the time of day.

Honeybees can learn scents or colours in a time-linked process and remember them in a 24-hour cycle. Circadian systems permit organisms to measure time for adaptively significant purposes. Bees synchronize their behaviour with daily floral rhythms, foraging only when nectar and pollen are at their highest levels. At other times, they remain in the hive, conserving energy that otherwise would be exhausted on non-productive foraging flights.

The processes of learning and remembering are undoubtedly more sophisticated in primates and mammals than in insects, but there seems to be a continuum in these capacities across the animal kingdom. The abilities of an animal seem to be governed largely by what it needs in order to pursue its lifestyle, rather than whether or not it possesses a backbone. The properties of learning and memory in insects have been shown to be well suited to the requirements of the tasks that they have to perform. Honeybees can plan their activities in time and space, and use context to determine which action to perform and when.

Is It Necessary to Feed Bees?

A very pertinent question at this time of year when as the one of the key messages from the
Members Website Tips Checklist for this month says '*February is all about making sure that your bees have sufficient to eat and drink'.* And of course feeding at the appropriate time is vital to the survival of your bees, but should we feed additional 'unnatural' food such as fondant?

There are some beekeepers who feel it is better in the autumn to just leave some, or even all, of the stores a colony has collected during the season because this is more natural. Like all areas of beekeeping there is room for all views.

There are even those who argue that we should not 'molly-coddle' colonies as natural selection will sort things out, and so it may, but while we wait for this 'super-bee' to evolve, how do we beekeepers and our bees survive ? And, if we just leave the bees to their own devices there are risks. How many colonies would survive without our intervention since Varroa arrived back in the early 1990's?

But feeding is not natural? Well, cane sugar is sucrose and chemically the stuff we buy is no different from that in nectar, after all, it comes from plants and is made using the sun's energy during photosynthesis. But, I hear, it does not contain the trace micro-nutrients needed to keep bees healthy. True, honey does contain some amino acids and vitamins but in minute traces and in any case, pollen is the bee's source of these, which reinforces how a varied and abundant pollen diet is vital.

Feeding does have its place but it must be done correctly and monitored, otherwise beekeepers are lulled into a sense of false security — *I've fed the bees so all is well*.

Some feeding tips — the dos and don'ts!

1. Feed only the correct material and in the correct concentration — no adulterations.
2. Use the appropriate type of food:-
   - 1:1 sugar syrup for emergency feeding in late summer (August).
   - 2:1 sugar syrup in the autumn to ensure the colony has sufficient stores for winter survival
   - Fondant mix or such as Ambrosia candy during November to February.
   - 1:1 sugar syrup in February / March to stimulate growth in the spring and ensure no starvation.
   - Pollen patties (pollen substitute) in February.

(Note - syrup quantities are quoted by weight
2:1 syrup = 1 kilo or 2 lbs of sugar to 0.5 litre or 1 pint of water.
1:1 syrup = 1 kilo or 2 lbs of sugar to 1 litre or
2 pints of water.)

3. When feeding prior to the winter give the bee's sufficient time to process the stores into a state that will remain suitable for them to use — so that it is ripe and will not ferment in the combs.
4. Feed all colonies at the same time. This will give less risk of robbing.
5. Feed in the evening when flying has stopped there will be less excitement, and less robbing again.
6. Don't feed honey unless it is your own, and even then not old or over-heated stuff.

So the answer is a definite YES - it is necessary to feed your bees. It has to be done correctly, at the right time, and with the appropriate feed.

HOW DO THE BEES SURVIVE IT???

The following is taken from a scientific paper reporting on research in the U.S. and gives an insight into how one of their largest (if not the largest) beekeeping operation manages its colonies.

'Standard beekeeping management practices for an operation of this size were employed. Treatment regimes throughout the year were as follows: (1) anti-mite treatment April 2009, just prior re-queening – amitraz; (2) antibacterial treatment May 2009 - oxytetracycline hydrochloride (OTC) (Terramycin™); (3) anti-fungal (*Nosema sp.*) treatment August 25, September 12, and October 13, 2009 - fumagillan; (4) antibacterial treatment late August, early September, 2009 - tylosin tartrate; (5) anti-mite treatment September 12, 2009, after harvesting honey; (6) anti-mite treatment – early November and early December 2009 - essential oils from lemon grass and spearmint (Honey-B-Healthy™). Honey bees colonies were periodically supplemented with sugar syrup and protein supplement. In April (1 gallon) and October (2 gallons) bees were fed 50% (weight/volume) sucrose; in November all colonies received 3 gallons of a 1:1 mixture of high fructose corn syrup-55 (HFCS-55, 55% fructose, 42% glucose) and sucrose syrup. Additional sugar syrup was given to colonies based on colony weight (<80 lbs - 3 gallons, 80–90 lbs - 2 gallons., 90–100 lbs – none). '

Runckel C, Flenniken ML, Engel JC, Ruby JG, Ganem D, et al. (2011) Temporal Analysis of the Honey Bee Microbiome Reveals Four Novel Viruses and Seasonal Prevalence of Known Viruses, Nosema, and Crithidia. PLoS ONE 6(6): e20656. doi:10.1371/journal.pone.0020656

Mating nucs.

Can be a nuc box containing 3, 4 or5 frames or a mini nuc eg Apidea. These should have enough young bees and enough food. The queen should mate between 5 and 8 days after emergence, and should start laying within 15 days. She cannot be mated successfully after 20days after emergence, she is then 'stale' and will become a drone layer.

The mating nucs should be placed near good landmarks so that they will easily find their way home and where there will be a good supply of sexually mature adult drones.

To make up a 3 frame nuc, you will need one frame of sealed brood and bees, one frame of honey, and one frame of empty, preferably drawn comb, together with the young nurse bees shaken from another comb.

For a five frame nuc, you need 2 frames of sealed /emerging brood, at least one frame of stores and one or two frames of foundation or drawn comb, plus more nurse bees shaken from another frame.

The nuc should be made up the day before the queen cell is introduced, which should be done the day before the queen is due to emerge. The queen cell is placed in a frame of brood near the top bar. I press an indent in the comb with my thumb and gently press the cell into it.

The nuc will need to be fed with 50:50 syrup until the nuc gets going.

A mini 3 frame nuc needs fewer bees, but is trickier, with a higher failure rate.
Although the queen should mate earlier than if in a full nuc, there is a higher risk of queen loss on her mating flight and of the bees absconding.

A mini nuc should be prepared 2 days before the queen is due to emerge. To prepare it, starter strips of foundation are fitted to the frames, the feeder is filled with candy, the entrance closed, and the roof replaced.

It should be stocked with 250-300 mls - measured with a cup-, of mainly young bees, which are lightly sprayed with water before pouring them into the upturned nuc through its opened floor. The nuc is then restored to the right way up and, after half an hour the queen cell is introduced through the hole in the 'crown board' after being wrapped in a piece of foil with a hole in the bottom through which she can emerge. The nuc is then stored in the dark for 3-5 days so that they form a 'unity' before being set out in the mating apiary at dusk. Open the entrance after dark.

While being stored it should be lightly sprayed with water through the ventilation grill. The mating sites should be as far apart as practical, facing different ways and each nuc marked with something.

Once egg laying has commenced, the queen will need to be rehoused as the available comb area will soon be insufficient.

Finding and marking the queen.
Michael Birt

Having a marked queen is such a help to hive management that I am surprised that more beekeepers don't make the effort to do it. It also means that you are more likely to see her before you squash her or drop her in the grass. The best time to find a queen is early in the year and there is a technique which can be used, even by those with little experience. Before you start, have the marking pen and cage, if you are using one, where you can put your hand on them without taking your eye off the queen. The first points to realise are that finding the queen is psychological to some extent! Be determined and you will probably succeed, be doubtful and you probably will not. You are not looking for an individual bee, but rather a different pattern or way of moving on the comb. Try the following:

1. Use as little smoke as you possibly can, none at all if possible and be extremely gentle.
2. Remove the first frame as before, quickly inspect it and put it to one side.
3. Disregard outer frames filled with stores, she may be here, but is unlikely to be if you have not disturbed them.
4. When you reach the frame which has lots of pollen on it, usually just to the side of the brood nest, start your careful inspection, which should be thorough but fairly quick.
5. Remove each frame containing brood in turn and, HOLDING IT WELL AWAY FROM YOU OVER THE HIVE, turn it over immediately so that the side away from you in the hive (the dark side) is facing you. Take your eye quickly round the outside of the frame, spiraling inwards to the centre, then turn and repeat on the other side. 6. Before you reach the end of the brood box she should have revealed herself, but, if not, go back through the frames, in reverse, a second time.

If the queen is still proving illusive, there is another trick.

Remove the outer frames, leaving just those frames with brood on them. Pair these up so that each pair has space around it but the frames in each pair have the usual spacing. Then leave the hive open for a while, perhaps while you inspect the next colony. When you go back take each pair of frames out together and immediately look on the dark side that is opening the frames like a book.

(This is much simpler if there are two of you so that you can each look at one frame.) The queen will almost certainly be on the inside of one of the pairs of frames.

I have seen this work even for complete novices

Raw Honey and Cinnamon:

It is found that a mix of honey and cinnamon CURES most diseases. Honey is produced in most of the countries of the world. Scientists of today also note honey as very effective medicine for all kinds of diseases. Honey can be used without side effects which is also a plus....

HEART DISEASES: Make a paste of honey and cinnamon powder, put it on toast instead of jelly and jam and eat it regularly for breakfast. It reduces the cholesterol and could potentially save one from heart attack. Also, even if you have already had an attack studies show you could be kept miles away from the next attack. Regular use of cinnamon honey strengthens the heartbeat. In America and Canada, various nursing homes have treated patients successfully and have found that as one ages the arteries and veins lose their flexibility and get clogged; honey and cinnamon revitalize the arteries and the veins.

ARTHRITIS: Arthritis patients can benefit by taking one cup of hot water with two tablespoons of honey and one small teaspoon of cinnamon powder. When taken daily even chronic arthritis can be cured. In a recent research conducted at the Copenhagen University, it was found that when the doctors treated their patients with a mixture of one tablespoon Honey and half teaspoon Cinnamon powder before breakfast, they found that within a week (out of the 200 people so treated) practically 73 patients were totally relieved of pain -- and within a month, most all the patients who could not walk or move around because of arthritis now started walking without pain.

BLADDER INFECTIONS: Take two tablespoons of cinnamon powder and one teaspoon of honey in a glass of lukewarm water and drink it. It destroys the germs in the bladder....who knew?

CHOLESTEROL: Two tablespoons of honey and three teaspoons of Cinnamon Powder mixed in 16 ounces of tea water given to a cholesterol patient was found to reduce the level of cholesterol in the blood by 10 percent within two hours. As mentioned for arthritic patients, when taken three times a day, any chronic cholesterol-could be cured. According to information received in the said Journal, pure honey taken with food daily relieves complaints of cholesterol.

COLDS: Those suffering from common or severe colds should take one tablespoon lukewarm honey with 1/4 spoon cinnamon powder daily for three days. This process will cure most chronic cough, cold, and, clear the sinuses, and it's delicious too!

UPSET STOMACH: Honey taken with cinnamon powder cures stomach ache and also is said to clear stomach ulcers from its root.

GAS: According to the studies done in India and Japan, it is revealed that when Honey is taken with cinnamon powder the stomach is relieved of gas.

IMMUNE SYSTEM: Daily use of honey and cinnamon powder strengthens the immune system and protects the body from bacterial and viral attacks. Scientists have found that honey has various vitamins and iron in large amounts. Constant use of Honey strengthens the white blood corpuscles (where DNA is contained) to fight bacterial and viral diseases.

INDIGESTION: Cinnamon powder sprinkled on two tablespoons of honey taken before food is eaten relieves acidity and digests the heaviest of meals.

INFLUENZA: A scientist in Spain has proved that honey contains a natural 'Ingredient' which kills the influenza germs and saves the patient from flu.

LONGEVITY: Tea made with honey and cinnamon powder, when taken regularly, arrests the ravages of old age. Use four teaspoons of honey, one teaspoon of cinnamon powder, and three cups of boiling water to make a tea. Drink 1/4 cup, three to four times a day. It keeps the skin fresh and soft and arrests old age. Life spans increase and even a 100 year old will start performing the chores of a 20-year-old.

RASPY OR SORE THROAT: When throat has a tickle or is raspy, take one tablespoon of honey and sip until gone. Repeat every three hours until throat is without symptoms.

PIMPLES: Three tablespoons of honey and one teaspoon of cinnamon powder paste. Apply this paste on the pimples before sleeping and wash it off the next morning with warm water. When done daily for two weeks, it removes all pimples from the root.

SKIN INFECTIONS: Applying honey and cinnamon powder in equal parts on the affected parts cures eczema, ringworm and all types of skin Infections.

WEIGHT LOSS: Daily in the morning one half hour before breakfast and on an empty stomach, and at night before sleeping, drink honey and cinnamon powder boiled in one cup of water. When taken regularly, it reduces the weight of even the most obese person. Also, drinking this mixture regularly does not allow the fat to accumulate in the body even though the person may eat a high calorie diet.

FATIGUE: Recent studies have shown that the sugar content of honey is more helpful rather than being detrimental to the strength of the body. Senior citizens who take honey and cinnamon powder in equal parts are more alert and flexible. Dr. Milton, who has done research, says that a half tablespoon of honey taken in a glass of water and sprinkled with cinnamon powder, even when the vitality of the body starts to decrease, when taken daily after brushing and in the afternoon at about 3:00 P.M., the vitality of the body increases within a week.

BAD BREATH: People of South America, gargle with one teaspoon of honey and cinnamon powder mixed in hot water first thing in the morning so their breath stays fresh throughout the day.

HEARING LOSS: Daily morning and night honey and cinnamon powder, taken in equal parts restores hearing.

PROPOLIS

Propolis is the soft, pliable and very sticky orange substance that gums all the hive parts together and stains your clothes during summer hive inspections.

It is also the hard and brittle orange sealant that has to be cracked open in order to enter the hive during winter or early spring. No wonder it goes by the name “bee glue”!

Historically, it has been unpopular with beekeepers, who have tended to selectively breed the Propolising trait out of their stock.

Derived from the Greek, propolis means something like “before the city” and it is used by honey bees to cover almost every surface within the colony.

In the established tree nest of a feral colony, the rough bark immediately surrounding the entrance is bitten away and a smooth layer of propolis is laid down. If the entrance itself is too large then the bees reduce its size using propolis.

Within the nest cavity, after removal of all weak and rotten wood, any holes or crevices within the walls are filled and smoothed out with propolis. Indeed, one of the first steps in transforming the cavity into a home is the coating of the entire inner surface of the nest area with a 0.3-0.5mm propolis film known as a propolis envelope. Thicker ridges of propolis are then laid down at the attachment points of comb to the walls.

On comb itself, a thin propolis film is found upon the outer rim of every cell.

Workers even embed propolis inside cleaned and polished cells. Any cells containing contaminated pollen become entombed in propolis as, upon their death, do any colony invaders that are too large for the bees to physically remove. It is obvious that propolis is highly valued by the bees.

What is its purpose?

Propolis is a crucial architectural fabric within a honey bee colony. It serves as a caulk for blocking drafts and limiting the influx of water from tree sap or the immediate external environment. It can also be used as a simple physical defence against a range of pests.

For example:

At the entrance, a sticky layer of propolis can deter small nest invaders such as grubs and ants.

Within the nest proper, it is used to eliminate any cracks and crevices that would otherwise provide ideal egg-laying sites for wax moth also within the nest, it can be used to trap small hive beetles in “propolis prisons”, thereby breaking the reproduction cycle.

However, all these important physical defence functions are almost trivial compared to what is arguably its primary role, namely the provision of colony-level defence against microbial infection. Any warm and humid cavity containing large stores of carbohydrate and protein, open brood and highly social trophallactic insects should be an obvious target for microbial infection.

However, containing over 300 plant-derived chemicals with antibacterial, antiviral and antifungal properties, the propolis envelope provides “social immunity” for the colony. Being present on every conceivable nest surface, it literally serves as a bioactive doormat that is constantly decontaminating the inhabitants of many potential pathogens.Whilst much of the antimicrobial effect is probably dependent upon direct physical contact with propolis, some might be due to volatile components that diffuse through the air.

Examples of how propolis alters the microbial landscape and/or the metabolism of certain pests are summarised below:

Mitigation of the virus threat posed by Varroa destructor mites.

There is 100% Varroa mortality when the mites are exposed to a high concentration of the volatiles from alcohol-soluble propolis, whilst weaker concentrations significantly impair mite metabolism. The varroa mite serves as a devastating viral transmission route against which honey bees currently have no effective natural defence.

Protection against Paenibacillus larvae (American Foul Brood)

Propolis protects larvae against AFB spores, but it cannot eradicate established disease. It has also been shown to reduce the AFB spore load in honey.

Improved honey bee survival in Aspergillus flavus (Stonebrood)-contaminated nests

Propolis inhibits in vitro fungal growth. It also induces honey bee P450 isoenzymes that metabolise mycotoxins into non-toxic products, thereby allowing bees to live longer in their presence. In contrast, P450 inhibitors shorten honey bee lifespan in the presence of mycotoxins

Disruption of the reproductive activities of Galleria mellonella (Greater Wax moth)

Propolis can impair the metabolism and increase the mortality of the greater wax moth

Protection against scavengers of dead flesh

Propolis is used to encapsulate the dead bodies of any hive invaders too large for honey bees to expel from the nest This minimizes carcass attractiveness to diverse scavenging arthropods at various stages in their life cycle. It also minimizes nest contamination by a wide range of bacterial and fungal decomposers

Feeding Time.

Early September means feeding bees for Winter. Sooner than this and they will welcome the rations as incoming food and turn them into brood, much later and the cooler nights will make it more difficult for the bees to 'ripen' the stores and they may ferment. The aim must be to ensure that the bees have sufficient food to get them through to the Spring, when flowers are once more abundant. This is the natural order of things and will mean that emergency feeding with fondant in the middle of Winter, with its attendant disadvantages, will not be necessary. How much do they have? The first job is to assess how much artificial food is needed. Look through the brood box and work out how much honey is already there. A national brood comb full of honey on both sides weighs 5lb and a super comb, 3lb. Using these guidelines it is possible to estimate the amount of honey in the hive. If the stores are unsealed, this may mean that they are nectar or unripe honey, some more water will be evaporated from them and they will not, therefore, occupy so much space when converted to honey. How much do they need? A good-sized colony in a National brood box needs 35 – 40lb of honey or honey equivalent to get through the winter. (Bigger colonies in larger brood boxes may need more.) So, to decide how much feed is needed, simply deduct the figure you have reached during your assessment from this total. The bees will need sufficient supplementary food to bring them up to their 35 – 40lb. What do I feed? The traditional food for bees is made by dissolving granulated sugar in water to make a syrup. There are alternatives, but I am going to stick with the sugar syrup as it gives good results and is easy to make. The mix should be 2lb of sugar to 1 pint of water. This is often referred to as 'thick' syrup and using it will ensure that as much energy-giving sugar as possible is fed to the bees in the quickest way, and they will be able to 'ripen' it to store away in the shortest possible time. 8lb of dry sugar is equivalent to 10lb of honey and, when mixed with water, will make 1 gallon of sugar syrup. A colony with a shortfall of 20lb will, therefore, need about 2 gallons of thick syrup. Dissolving the sugar in the water is not so easy: the water must be very hot and it is necessary to stir the mix continuously until the sugar has all dissolved. It is then left to cool before feeding it to the bees. A simple tip here: it is not necessary to weigh out all the sugar and measure all the water. Use any container, put the required amount of dry sugar into it and mark where this comes to. Pour the hot water onto the sugar until it comes up to the mark made before, stirring all the time. I use honey buckets for this, I can then put the lids on and label them to say which hive they are intended for. In this way it is possible to keep track of how much food each hive has had. How to feed There are a few very important rules to obey when feeding. The biggest risk is robbing so everything must be done to minimise this: Always feed in the evening. Feed all the colonies in an apiary at the same time. Clean up any syrup which is spilt. Keep entrances reduced. There are a number of different types of feeder. For the home apiary a rapid feeder is suitable as it is not a great problem to fill it up each evening. There are various sizes but most hold about 4 pints and will need filling frequently. There are also jumbo rapid feeders holding just over 1 gallon. I use these and find them brilliant. They stack together for storage but they need a new hole in a crown board as they do not fit over the normal holes. All these feeders need an empty super to surround them and support the roof, but, once in place, they can be filled in the evening without even putting on a veil. If the bees are in an out-apiary an Ashforth type feeder is much more sensible as it will hold about 2 gallons of syrup and will not need refilling often. No empty super is required for these as they sit directly over the frames, but they do need a certain amount of maintenance if the joints are not to become leaky. You will be aware that I have not mentioned contact feeders. These are basically plastic buckets with a small area of fine gauze in the lid, which allows the bees to access the syrup. The feeder is filled, then upended directly over the feedhole. A vacuum will be created in the bucket so that the syrup cannot pour out. These can be large or small feeders, they need a super surrounding them and they are cheap. However their disadvantages are that they may leak, especially when first put in place, and the hive has to be disturbed to refill them. Only once do you have a lid come off as you turn the feeder over - - - . Whatever type of feeder you choose, once you have started feeding, keep the feeder topped up, and get the feed into the hives as quickly as possible. A few additional points 1. People ask if it is possible to overfeed. The only problem may arise in the Spring where a surplus of food may reduce the area available for egg-laying. This is easily rectified by replacing a frame or two of food with empty frames of, preferably, comb. 2. Can feeding and Varroa treatment go on together? They often have to given the time constraints at this time of year. It may be necessary, as one of our members found last year, to provide a 'ladder' of twigs up to the feeder. 3. If bees ignore the feed (remember that sugar syrup has no smell) it often helps to dribble a little syrup down through the feed hold to 'tell' the bees where it is. 4. If overwintering 5-frame nucs, they will need feeding but they will need further attention later, and probably feeding with fondant after Christmas, as they cannot store sufficient syrup to get them through the Winter.

After the 'basic' – what next?

So you passed your basic. Well done! Your ability to 'read' your bees will continue to develop as you gain experience but you can enhance and enrich your enjoyment of beekeeping by continuing your beekeeping education. So what's on offer? The BBKA have a series of seven written exams (referred to as modules), two practical assessments for those who prefer to be 'hands on' and two stand alone specialist exams. The Modules The subjects for the seven modules are: 1 .Management 2.Products and forage 3. Pests, diseases and poisoning 5 .Biology 6. Behaviour 7. Selection and breeding 8 .Management, health and history In the best Monty Python tradition, there is no module 4! Each exam lasts 1½ hours. There are 10 brief questions with one word answers to get you going, 4 more searching questions from a choice of 5 and 1 'in depth' question from a choice of 2. In 2012 you will be able to take modules 1,2,5 & 7 in March and 1.3.6 & 8 in November. Passing 1, 2 and 3 plus one other (except 8) gets you an Intermediate Theory Certificate. Passing all 7 gets you an Advanced Theory Certificate. You can take them in any order with the exception that module 8 must be taken last. It will take you a number of years to get through all the exams and module 8 has been re-designed to touch on all the previous papers to make sure you are still up to date. To make life interesting module 8 also covers a lot of extra material. Practical Assessments On the practical side you can take the General Certificate in Beekeeping Husbandry. This is an assessment in your own apiary. Two assessors will spend around half a day with you. The syllabus says 2 hours. Don't you believe it! You will be expected to have 3 honey producing colonies and some form of simple queen rearing programme. You will be asked to demonstrate techniques such as marking and clipping a queen, artificial swarming, making up a nuc for a specific purpose etc., Your extracting facilities will be scrutinised and you will be asked questions about many aspects of beekeeping in much greater depth than you needed for the basic. Your hive records from the past couple of years will be closely examined and they need to be comprehensive. It is usually suggested that you need to start preparing yourself, your apiary and your equipment at least a year before this assessment. Then there is the Advanced Certificate in Beekeeping Husbandry. This is currently held once a year in June at the National Beekeeping Centre at Stoneleigh, Warwickshire. It is aimed at those who intend to teach. You have to give a short lecture, open a hive and perform a variety of tasks as if you were demonstrating to a group of mixed ability beekeepers, discuss queen rearing and demonstrate grafting, discuss microscopy with an examiner and demonstrate adult bee disease diagnosis and finally attend an interview at which you will be asked questions on many aspects of beekeeping. Each of these tasks takes about an hour. Once you have your General Certificate in Beekeeping Husbandry and your Intermediate Theory Certificate you will become a Qualified Bee-keeper. Achieving a pass in the Advanced Certificate in Beekeeping Husbandry and holding the Advanced Theory Certificate will elevate you to the dizzy height of Master Beekeeper. 'Stand alone' Exams The BBKA offer two other 'stand alone' exams. The Certificate in Microscopy and the Show Judge Certificate. You can apply for the microscopy certificate as long as you have passed the basic but I suggest a few years practice and experience would be a good idea. To apply for the Show Judge Certificate you need to have your General Husbandry Certificate plus modules 1 and 2. You also need a track record of success in national and county level shows. This is as far as the BBKA can take you. If you wish to develop your skills to the highest level you will want to attempt the National Diploma in Beekeeping. You will then be able to put the coveted NDB letters after your name

Study Methods

So how do you get started? First stop is the BBKA website where you will find the syllabus for each exam and assessment, a reading list, past exam papers, an application form and the costs and deadlines for application. (Deadlines vary from the middle to the end of February and you send your application form to Audrey Gill, the Surrey Examinations Secretary,143 Smallfield Road, Horley, Surrey, RH6 9LR). For the modules there are excellent correspondence courses and I highly recommend these. (£45 each in 2011) Enrol by early autumn (contact Chris Utting – 01237 474500 – chrisutting@btinternet.com) and get as much work under your belt as you can by Christmas. For most of us, autumn and Christmas are busy times so you will need January and February to pull all the information together. Holding module exams in November 2012 is a new departure for BBKA. Older members will remember that this used to happen but until now it has been once a year in March for a good few years. At present it is not clear how correspondence courses will work during the summer as most tutors will be busy with their own beekeeping activities. Ask Chris Utting! The newly re-vamped BBKA website is headlining the intention to provide internet based study. This is currently in development so you need to keep an eye on the BBKA website for further information. Reigate BKA and other associations in Surrey will offer courses from time to time so keep an eye on the Reigate newsletter and look at the Surrey BKA website (www.surreybeekeepers.org.uk) for information about other divisions. If there's no course available why not set up a self help group with a few like minded members? For small numbers, meeting at each other's homes to discuss elements of the syllabus has worked well in the past. For the practical assessments there will also be occasional RBKA courses and setting up your own self help groups is again a good idea. You should also be aware of some excellent 2 day courses run by the National Diploma in Beekeeping board. These are not directly aimed at the BBKA exams but you will learn a great deal from them. You can find details of these on the website www.national-diploma-bees.org.uk Don't lose sight of the main objective. We are increasing our knowledge in order to better understand our bees and increase our enjoyment of the craft. The object is most definitely not to collect certificates!

Looking at Flowers

Every new endeavour has unintended consequences. I have always curled my lip at gardens that are planted for colour at the expense of structure, form and good taste. Coming from a design background, I had until now believed that these things matter. But although I still do, now I am beginning to see these things from a new perspective. With my new interest in apiculture, every flower that opens, every floral scent carried on the air signifies a new resource to be exploited. The aesthetics have suddenly become a secondary issue. I had a poppy the other day with three bumble bees busy in the same bloom. I realized the urgency of their labour the following morning: The flower was gone. In its place the seed case had already formed after only one night. I do realize that this is the raw enthusiasm of the new recruit: I am puzzled by the honeysuckle that flowers but carries no bees. I was impatient at my lavender hedge that just won't open up. I just want that background hum, that sight of bees at work. And when I do see them among their flowers, I wonder if they are missing some. Their journey from stem to stem seems random and haphazard. Their work seems fuzzy, a dalliance with beauty, although a properly managed observation of their work would no doubt reveal an iron efficiency. My new interest is running far ahead, fuelled by enthusiasm. Perhaps the rational view will catch up. Another consequence of my new interest is my new right of access, and sort of de facto shared ownership of the gardens around. Bees care nothing for property boundaries. They are not communists, not robbers, not conquerors. Just free spirits, outside the hive, at any rate. (Freedoms inside the hive are an entirely different matter.) When my bees finally arrive, when we forge our new partnership ,the barriers of ownership will fall away, and the gardens will be ours.

Porter Bee Escape.

This device was invented in 1891 - by Edward Porter, and is a very effective method of removing bees from a super if used correctly. Correctly means using a minimum of 2 escapes in a crown board the correct way up – most have top written on them if not fit it with the single hole on top! Additionally the spring must be adjusted so there is a 3mm gap between each pair of springs. To use the board you must provide enough space for the bees to evacuate to so it is no good just placing the clearer board on top of the brood box. Any colony that has collected a super full of honey will be strong and populous. You must add another super below the clearer board for the bee to collect and cluster in - this must obviously not be a full super. Effective precautions must be taken to ensure the super is bee tight so place another crown board on top (sealing off any feeder holes) and use gaffer or masking tape to cover any bee sized gaps. Do not rely on just a roof as they often have faulty ventilators and/or fit loosely. The board works best on a warm day when there is a flow on and most of the bees will clear in 24 hours; any straggler can be shaken out. Sometimes if the weather is poor they may be reluctant to leave the super but before you blame the weather, as all 'Englishmen' do, check that there is no brood in the super. Bees will not desert their young and many times I have found supers still full of bees because of a faulty queen excluder allowing the queen access to the super(s). I always now (well when not in a rush!) check the centre two frames in the first super for brood – finding brood needs other actions not relevant to this article. An addition problem is that some brood may be drone brood and drones being bigger will block the escape springs. How many boards do I need? Well in my experience placing a pile of supers over a single clearer board will not work so if you have four supers to clear place TWO empty supers below a clearer board topped with the first TWO supers to be cleared. Then add another clearer board with the other TWO supers on top before sealing the pile. If you have three supers to clear the order is clearer, ONE super, clearer, TWO supers and a sealed crown board. Do not try to clear more than four supers and it is better to just clear them in pairs. Clearing multiple supers only works in warm weather with a good flow on so be warned! Advantages

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Respect your Neighbours

There are some sound reasons to be aware of and be respectful to your apiary neighbours. The first is disease; we all have a responsibility to avoid the spread of diseases. It cuts both ways, you don't want theirs and they don't want yours. Make sure your bees are healthy. Know about the location of neighbouring apiaries and try to be aware of the health of their bees. Treat swarms with great care; isolate them for a time until you are sure they are fit and well. The second reason is forage availability; with a doubling in our membership in two years there is an increased possibility of overcrowding of hives in an area. Again this cuts both ways, overcrowding disadvantages all parties. The only realistic way to find out about neighbours is through contact in your division and with neighbouring divisions. Please use the network of contacts that exists in our association when you are setting up a new apiary and be particularly mindful of disease if you take swarms collected by another beekeeper