Beetalk

General info and news about bees
March 2018

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

THE POSTAL ADDRESS IS:

NORTHERN BEE BOOKS
SCOUT BOTTOM FARM
MYTHOLMROYD
HEBDEN BRIDGE HX7 5JS
PHONE 01422 882751

BY THE WAY, THEIR CONCESSIONARY RATE

www.beedata.com/beebooks.htm

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.

E H Thorne (Beehives) Ltd disclaims all responsibility for all consequences of any person acting on, or refraining from acting in reliance on, information contained above.

From EH Thorne's online catalogue 2010 - other sources are available

Curiouser and Curiouser

. the weird and wonderful world of insects.

The honey ant

HONEYPOT ants have an unusual food storage system. Some members of each colony act as living receptacles known as 'repletes', these ants become engorged with food from the workers and hang from the ceilings of chambers deep underground to the point that their abdomens swell enormously, a condition called plerergate. Other ants then extract noursihment from them. They Function essentially as living larders.
Honeypot ants belong to any of five genera,
including Myrmecocystus.

Honey ants are unique in using their own bodies as storage, but they have a greater function than just storing food. Some store liquids, body fat, and water from insect prey brought to them by worker ants. They can later serve as a food source for their fellow ants when food is scarce. In certain places, they are eaten by humans as sweets and are considered a delicacy.

Unlike here, Honey Ants mainly hang from the ceiling of their chamber dwellings

These ants can live anywhere in the nest, but in the wild, they are found deep underground, literally imprisoned by their huge abdomens,
swollen to the size of grapes. They are so valued in times of little food and water that occasionally raiders from other colonies, knowing of these living storehouses, will attempt to steal these ants because of their high nutritional value and water content. They are known to change colours, commonly green, red, orange, yellow, and blue. Like all formicine ants, honey ants lack stingers so they spray fine droplets of formic acid from their abdominal tip

Understanding How Bees Keep Warm in Winter

Apis mellifera worker bees begin assuming a clustering configuration in the centre of the nest as ambient temperatures start dropping. Individuals remain active at the core of the cluster, keeping space between themselves, whereas bees at the cluster's edge pack together tightly. Bees enter empty cells headfirst, thereby maintaining the contiguous state of the cluster in spite of the interspersing combs. The cluster tightens and expands as temperatures drop and rise.

Early Models of Bee/Cluster Behaviour.

Research by Phillips & Demuth in 1914 showed that the temperatures at the centre of the cluster begin increasing as ambient air temperatures begin decreasing. This formed the basis for an early model of honey bee winter thermoregulation - that core bees respond to decreasing ambient temperatures by shivering to actively generate heat and warm the cluster.
This model assumed the existence of an information conduit through which core bees learned of ambient temperature. It also assumed an altruistic response on the part of the core bees to expend the energy needed to generate heat for the welfare of nest mates.

Recent Model of Bee/Cluster Behaviour.

The early model has now been replaced with a more parsimonious one that takes into account nothing more than the actions of individual bees as they respond to temperature conditions in their immediate vicinity (*Heinrich, 1993*).
In the Autumn, as temperatures drop, bees do what any of us would do, they move closer together to share body heat. Young bees cannot shiver to generate heat, and they naturally have a low cold tolerance, so these individuals move by choice towards the centre where it is warmer. Older bees, in contrast, have a higher cold tolerance and are able to shiver their flight muscles, so these individuals end up in the middle layers and outer mantle.
As temperatures continue dropping, all bees both young and old respond by clustering tighter together. The mature bees shiver to keep warm and it is their heat not the young bees in the middle that are responsible for warming the whole cluster.
Eventually, the problem at the core is no longer excess cold but excess heat, and the young bees respond by moving away from the centre, opening channels in the process that allow the exchange of inner air that warms the mantle of bees and outer air that cools the interior bees.
It is this excess heat in the middle of the cluster that tricked earlier investigators into thinking that core bees were the altruistic heat generators for the cluster.

Critical Temperatures

There are two temperatures that regulate much of the behaviour by the bees: 35°C (95°F) and 15°C (59°F).
Young bees naturally prefer temperatures nearer 35°C and move further in or out of the cluster to find it. The lower number, 15°C, is the minimum temperature at which an individual bee can shiver its flight muscles and generate heat. It is possible for older, cold-tolerant bees at the surface of the cluster to fall below this threshold and enter a 'cold coma'. These hardy individuals can survive this state for several hours, passively relying on the shivering and contracting bees beneath them to stay above lethal hypothermia, waiting until their bodies exceed 15°C again to resume shivering. They constitute living insulation. But things take a critical turn if these bees are subjected to sustained temperatures below -2°C (28°F). (*Free & Spencer-Booth, 1960).*
A deadly cascade of events may then ensue if that lower ambient limit is realised and if bees deeper in the cluster cannot keep the surface warm enough. Surface bees begin dying from hypothermia and dropping off the cluster, imperilling the rest of the cluster with the loss of living insulation. If this cascade persists it spells certain doom for the cluster and, sadly, this outcome seems common as many first year colonies in temperate regions struggle to survive their first year

Varroa - A Brief Guide.

MITES reproduce on a ten-day cycle. To breed, a mated adult female mite enters a brood cell just before the cell is capped over, where she remains in the brood food until the cell is sealed. About four hours after capping she begins to feed on the immature bee and, after about 60-70 hours of entering the cell, the mite starts laying eggs on the larva which hatch into several females and, typically, one male.

Spread.

Mites can easily move between bees within the hive. They depend on adult bees for travel between colonies through the natural processes of drifting, robbing and swarming. Varroa can spread slowly over long distances in this way. However, the movement of infested colonies by beekeepers is the principle means of spread over long distances.

Mating.

Mating between mite offspring (usually brother and sister) occurs within the cell. Mature female mites leave the cell when the host bee emerges. Males and any remaining immature females die, unable to survive outside the sealed cell. With heavy infestations numerous female mites may enter the same cell to breed. The mites have a preference for reproducing within drone brood (10-12 times more likely). In fact in their original host, Apis cerana, they are only able to reproduce within the drone brood, but are also well suited to infest worker cells of the Western honeybee.

Bloodsucker

The adults suck the haemolymph (blood) of adult honey bees for sustenance, leaving open wounds. The compromised adult bees are more prone to infections.
In winter, when brood rearing is restricted, mites over-winter solely on the bodies of the adult bees within the winter cluster, until brood rearing commences the following spring. During the summer, female varroa mites may live for two to three months. During the winter, or broodless periods, they can live much longer, feeding on adult bees. Mites cannot survive more than a few days without bees to feed on. As well as causing physical damage by weakening the larvae and adults by feeding directly upon them, they also act as a vector for a number of honeybee viruses and the feeding process may stimulate latent infections to become highly virulent to the bees they affect.

Lifespan

The life expectancy of mites depends on the presence of brood and will vary from 27 days to about five months. During the summer mites live between 2-3 months, completing 3-4 breeding cycles. Developing mites pass through two juvenile stages, known as protonymph and deutonymph, before becoming adults. Development time from egg to adult for males is 6-7 days and, for females, 5-6 days. Each female lays 5-6 eggs, the first being a male followed by 4-5 female eggs laid at regular intervals of 30 hours.

Increase

Mite numbers can increase between 12 and 800 fold over a season. Researchers agree it is wise to try and keep varroa infestation in the hive below 1,000 mites.

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.

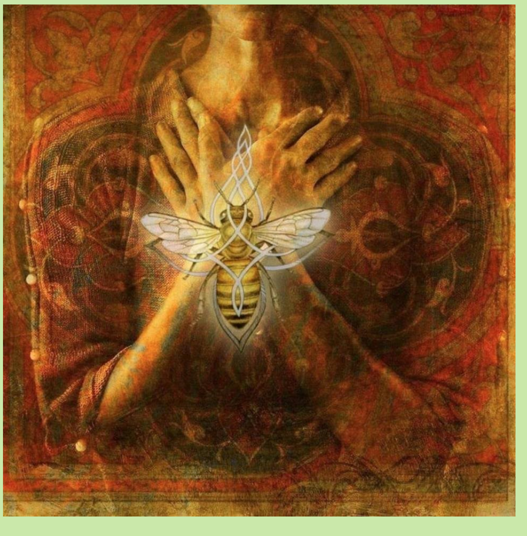
In order to discriminate between flowers, bees do not only use colour and scent, but also the shape of blossoms and whole plants. Bees can even identify blossoms according to abstract properties like central or axial symmetry and the number of petals , and thus categorise them.

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 kilometers 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.

———-



With golden honey on the tongue, the gift of sage and seer, the Bee Priestesses, the Melissae, the daughters of the hive, were the chief pollinators of Life. Goddesses, who through the alchemy of their bodies create the sweetest of golden nectars from our Mother Earth's bloom and flower. As with the rose and its thorn, sting and sweetness come together as One. Indeed the divine HUM of the Bee is said to regenerate matter itself; the hexagon of the honeycomb is a building block of Life. We priestesses have served the wisdom of the Bee in many cultures. The sweetest of Nature's flora and fauna express themselves through our bodies so that we might fully become One with her Essence."

<u>CLEARING BEE THE UNUSUAL WAY</u>

I will look at some of the unusual methods of getting the bees out of a super. Firstly let's start with the most violent – as far as the Bess are concerned – method, 'Blowing'. This is the method preferred by Bee Farmers as it is quick and requires just one visit.

The method is simple, place the super on its side and blow all the bees out with a leaf blower. Like everything there are 'tricks to the trade'. Which way do you blow, from the top or bottom? Intuitively you would think that you would blow through the top bars, as there is more room at the bottom for the bees to whoosh out, no it is the other way. This is because the air can enter the wide spacing between the bottom bars and be concentrated as it funnels up between the frames so forcing the bees out more effectively.

The super is placed with the frames vertical about 3 metres in front of the hive with the top bar facing the entrance, and it helps to raise the super off the floor by placing it on a spare box, or a special angled frame can be made. The blower nozzle is angled slightly up and directed between each frame in turn. Starting from one side of a super, each frame is given a blast of air, blowing from the bottom bar end of the box, through the top bars. The frames can be prised apart to enable the jet of air to reach the clustering bees. Giving the blower a little 'sideward flick' to create turbulence can help to break the bees grip. The tip is not to smoke the hive first or the bees will have their heads in the cells gorging themselves with honey which makes them difficult to dislodge without decapitation! So crack open the hive and quickly remove the super(s) before applying smoke to the top of the brood box, this calms the bees and allows the crown board and roof to be replaced without the bees boiling out. The bees will be blown at up to 200 mph into a pile in front of the hive and although disorientated, irate and a little sticky, they will soon crawl back in but not if the grass is soaking wet and it is raining. So this is a method for a warm dry day and is not recommended for the home apiary unless you don't like your neighbours.

You can watch a video of the method at http://www.youtube.com/watch?v=_4DMK2oRhW0

The second method is to 'stink' them out by using a fume board impregnated with a pungent but safe chemical although historically the latter was not always the case. A fume board looks like a crown board with a deeper space below it (around 2cm) to allow a fume pad or flannel lining to be fixed to its underside. A normal crown board over a shallow eke like the ones used to apply Apiguard© can be used. A liquid bee repellent is applied to this absorptive lining and the fume board is placed on top of the honey supers (in place of the normal crown and roof). Within minutes, the bees are repelled out of the honey supers and down into the brood chamber. Instant success! The honey supers can then be safely removed and taken to a bee-proof area. It helps to have full sun on the hive to heat the board and so evaporate the chemical repellent. What chemicals are used? Historically carbolic acid also called phenol (C_6H_5OH) and derived from coal tar was used but this is extremely corrosive and may cause dermatitis, liver & kidney damage, harmful effects on the central nervous system and heart, resulting in dysrhythmia, seizures, and coma. If that is not enough it also causes cancer. Other chemicals used as repellents were butyric propionic anhydride or benzaldehyde which smells of almonds but these are also toxic, combustible, and may cause respiratory and liver damage. There is however, a non-toxic blend of natural oils and herb extracts such as Bee Quick which can be bought from suppliers such as Thornes, together with fume pads. It costs around £13 for 200ml and should do a few supers.

Have I tried these? Yes I tried benzaldehyde as I could get some for free but it did not work that well and was too risky but it was interesting to hear the raised buzz from the hive and the bees rush away from the smell. I have seen Bee Quick used and it works but again needs a warm day.

I will leave you to decide
but my monies on the simple clearer board.

Processing honey.

Virtually all British honeys granulate, some quickly, others more slowly, so an essential for processing honey is some kind of warming cabinet. Some beekeepers have adapted old fridges or freezers by putting in electric light bulbs, but low-energy bulbs will not work, so this idea is rapidly becoming redundant. Increasingly people are using small tubular heaters in purpose made, insulated 'boxes' and, with a thermostat installed, these do a very good job. (It is essential that a qualified electrician inspects such equipment.) A warming cabinet can be bought from the suppliers but, whether bought or self-built the warmer must be capable of heating a 30lb bucket of honey (or 2) up to a temperature of 500C. At such a temperature a 30lb bucket of liquid honey will be converted to liquid in about 24 hours. The time will depend on the honey, and oilseed rape honey will probably take the full time, other types a bit less. It helps to stir the honey occasionally as it softens. Some beekeepers will throw up their hands in horror at mention of such a high temperature, but it is necessary to ensure that all the crystals are melted, otherwise the liquid honey will start to granulate very quickly and have a very short shelf life. Once the honey is clear it can

be filtered through a straining cloth, if this has not been done at the point of extraction, and then bottled. To be sure of keeping an attractive product on the shelf even longer, water-bathing the bottled honey, with the lids on, for 1 hour at 600C will be effective. It should be cooled as quickly as possible. The problem with heating honey is that the hydroxymethylfurfuraldehyde (HMF) content increases and it is illegal to sell honey with an HMF content higher than 40mg per kilogram of honey. We are not able to measure this, so we aim to keep heating to a minimum, but it is important to remember that two factors are at work to increase HMF: temperature and time, so a high temperature for a short time will have the same effect as a moderate temperature for a long time.

THOUGHTS ON A WINTER EVENING.

Often on a dark Winter's evening it may appear that I've nodded off in front of the wood stove, but the closed eyes and occasional grunt belie the truth that I'm considering how I will approach the next year's beekeeping. As a result of this endeavour I've decided that this year I will adopt a policy of entirely changing brood comb and as well as sterilising brood boxes each year. To many a beekeeper this will appear to be gross extravagance. There is indeed a cost, but then every investment has a cost. The question is whether the benefit exceeds the cost.

So what is the cost? A pack of ten sheets of wired standard deep foundation costs £3.95. The time taken to frame sheets of foundation is about an hour. To draw the comb on the ten frames will require from the bees about one pound of wax equivalent to about five pounds of honey or four pounds of sugar given as syrup. So the exercise costs about £10 plus an hour's work per colony.

So what are the hoped for benefits? In broad terms it is a healthy and productive colony. My experience to date, and I admit it is limited but encouraging, is that colonies are exceptionally productive on new comb and my top three productive colonies of all time have all been on new comb. A poor colony may only produce £40 worth of honey or less. A good colony can produce over £100 worth of honey. The possible benefits can more than balance the cost, though there are numerous reasons why one colony may thrive better than another.

There are a number of possible explanations why a colony prospers on new comb. The primary one is that changing brood comb drastically reduces the reservoir of disease pathogens stored in the colony. Many of the disease pathogens that cause serious damage to the honeybee spend all or part of their life cycle in or on the brood combs. These diseases include AFB, EFB, Nosema, Wax Moth, Braula, Chalkbrood and Stonebrood. Consider Nosema which is thought to be endemic in much of England. It weakens colonies, slows down the build-up in spring and, in serious infections, can lead to the death of a colony. The disease is spread when infected bees defecate on the combs within the hive. In normal conditions the bees will defecate outside the hive, but when the bees are confined within the hive for long periods, then the bees can soil the inside of the hive, spreading the disease to the house bees as they clean the hive.

Secondly, new comb gives the queen the opportunity to produce a dense compact brood nest in an area free from damaged comb and free from comb full of old pollen and granulated honey. Eleven frames of BS standard deep brood, fully utilised, are quite sufficient to support a colony of 80,000 bees. Do the math's if you don't believe this!

Thirdly, the transfer of the colony onto new frames requires the colony to produce wax and this, along with ample space for egg laying, inhibits the instinct to swarm, not entirely, but to a significant extent. Generally the exercise of changing comb would be carried out in April or May when the colony is well established and expanding quickly. There are a number of management methods that achieve the end of putting the bees on new comb. The better known of these are the Shook Swarm Method, the Bailey Frame Change and, indirectly, the Snelgrove Method of swarm control. So that's what I'm trying this year. If it works out, great – if not there'll always be someone to put me right.

Hive Robbing by Wasps and Means of Prevention.

WASPS will smell the honey and home into a hive where they will try to gain entry. A strong colony will prevent their entry and kill any persistent ones, but at a price! Worker bees will sacrifice their lives for the colonies survival but a strong colony should be able to fend off an attack. However, if it continues then the defenders weaken due to the loss of guard bees and there becomes a point where the colony gives up and the wasps get 'free' entry. Once this happens the colony is doomed and the brood, honey and bees will be carted off! So what can we do? •Keep strong and healthy colonies. • Do not spill honey or syrup and keep hive inspections and so exposure of combs to the minimum. • Reduce the hive entrance to make it easier for the bees to defend the colony. With severe problems reduce the entrance to a single bee-way. A small tube entrance can be easier for bees to defend. Having a floor to your hive with a devious entrance route is said to help. Some dispense with the normal entrance and have an 'up and over' one under the floor. Others place a
piece of glass in front of the hive entrance which the bees are able to circumvent but the wasps try to go through! BeeBase suggests closing open mesh floors with the floor insert. I assume that this is to reduce the 'area of honey odour' which attracts the wasps. However, several beekeepers testify to the fact that the wasps get 'confused' and try to enter through the direct route - the mesh. • If colonies are weak/under strength but healthy then unite them so they can fight off the attackers. • Control wasp nests around your apiaries by destroying nests in the spring and summer. This is clearly a good method of reducing the overall wasp population and reducing robbing problems in the autumn. Wasps do have a place in nature and destruction of wasp colonies on a wide scale will be disadvantageous to the environment, especially if you are a gardener as it has been suggested that a single wasp nest will catch five metric tons of insects through the course of the summer! • Trapping wasps in the apiary. Placing wasp traps such as jars/bottles containing a wasp attracting mixture will help. Wasps will tend to go to these traps as an easier option and drown. There are commercial traps available in garden centres and also one called WaspBane and waspinator (maybe a new acting part for Arnold now the Governorship is over!), which may be more effective and easier to use.

A Simple Wasp Trap
Take a plastic pop bottle and cut off the top third. Then invert the cut-off piece and placed into the lower portion, which is baited with a mixture irresistible to wasps. This works because the wasps are attracted by the bait odour and enter/fall into the trap but will find it difficult, but not impossible to find the small entrance. Just like a lobster pot!

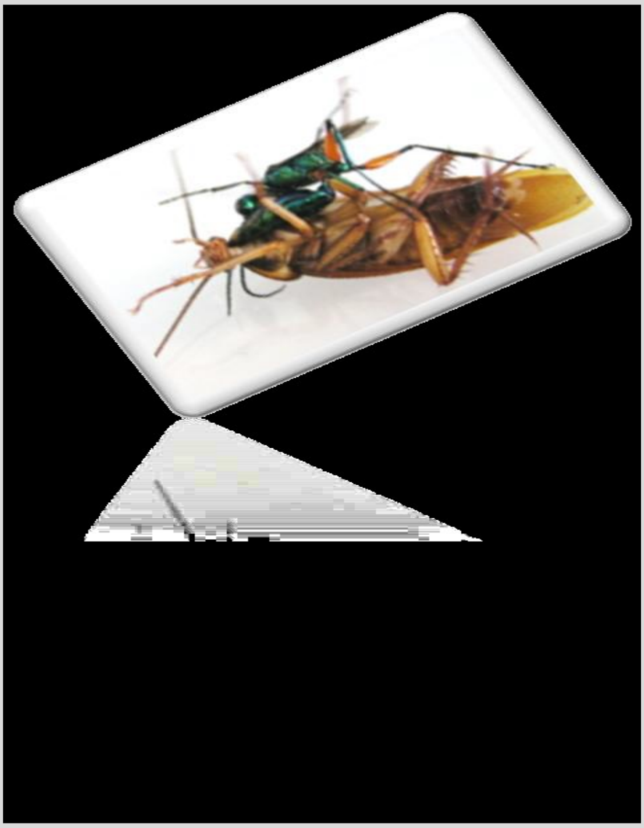
Mixtures
Bait mixture are like many things in beekeeping – every person you talk to has their favourite brew. However, the following pointers might help you decide on your brew:
- Never use honey unless you want to catch bees.
- Add a watery mixture of vinegar, sugar and salt. The wasps are attracted to the sweet and sour scent yet bees don't seem to be attracted by this sour mixture.
- Over ripe fruit seems to attract wasps – they like my apples.
- Mix two level tablespoons of Sardine and Tuna cat food into 200ml of warm water and pour into the wasp trap.
- You can replace the solution of water with mashed grapes, sugar and lemon juice, sugar and water, soda, vodka and orange, wine, maple syrup and water, etc.
- I found a use for lager – add a dash to stimulate fermentation.
- Add a dash of washing liquid as this causes the wasps to sink and drown by reducing the surface tension.

Tips
- Keep the wasp trap out of the rain as it will quickly fill with rainwater.
- Hang the wasp trap in a tree or shrub with base of trap well clear of vegetation.
- Locate traps well away from hives or you will attract more wasps to them.
- Place one trap upwind and one downwind of your hives at least five metres away.
- Empty them regularly as they fill up surprisingly quickly. Take care that the wasps are all dead!

The downside of wasp traps is they also attract and trap beneficial insects such as lacewing and hoverflies which are a natural pest control of aphids.

The late Dave Cushman' site has some excellent information on other wasp trap designs which can be found at www.davecushman. net/bee/wasptrap.html

Did You Know?



Did You Know?

—The Emerald Cockroach Wasp or Jewel Wasp (*Ampulex compressa*), mainly found in tropical regions, has a metallic blue-green body, with the thighs of the second and third pair of legs red. The female is about 22 mm long. The male is smaller and lacks a stinger.

—Female wasps of this species sting a cockroach twice. A 2003 study using radioactive labeling demonstrated that the wasp stings precisely into specific ganglia of the cockroach. It delivers an initial sting to a thoracic ganglion and injects venom to mildly and reversibly paralyze the front legs of its victim. This facilitates the second venomous sting at a carefully chosen spot in the cockroach's head ganglia (brain), in the section that controls the escape reflex. As a result of this sting, the cockroach will first groom extensively, and then become sluggish and fail to show normal escape responses. In 2007 it was reported that the venom of the wasp blocks receptors for the neurotransmitter octopamine.

—The wasp proceeds to chew off half of each of the cockroach's antennae. Researchers believe that the wasp chews off the antenna to replenish fluids or possibly to regulate the amount of venom because too much could kill and too little would let the victim recover before the larva has grown. The wasp, which is too small to carry the cockroach, then leads the victim to the wasp's burrow, by pulling one of the cockroach's antennae in a manner similar to a leash. Once they reach the burrow, the wasp lays a white egg, about 2 mm long, on the cockroach's abdomen. It then exits and proceeds to fill in the burrow entrance with pebbles, more to keep other predators out than to keep the cockroach in.

—With its escape reflex disabled, the stung cockroach will simply rest in the burrow as the wasp's egg hatches after about three days. The hatched larva lives and feeds for 4–5 days on the cockroach, then chews its way into its abdomen and proceeds to live as an endoparasitoid. Over a period of eight days, the wasp larva consumes the cockroach's internal organs in an order which guarantees that the cockroach will stay alive, at least until the larva enters the pupal stage and forms a cocoon inside the cockroach's body. Eventually the fully grown wasp emerges from the cockroach's body to begin its adult life. Development is faster in the warm season.

—Adults live for several months. Mating takes about one minute, and only one mating is necessary for a female wasp to successfully parasitize several dozen cock roaches.

—While a number of venomous animals paralyze prey as live food for their young, *A. compressa* is different in that it initially leaves the cock-roach mobile and modifies its behavior in a unique way. Several other species of the genus Ampulex show a similar behavior of preying on cockroaches. The wasp's predation appears only to affect the cockroach's escape responses. Research has shown that while a stung cockroach exhibits drastically reduced survival instincts (such as swimming, or avoiding pain) for approximately 72 hours, motor abilities like flight or flipping over are unimpaired.‖

Bee Stings

Nest Defence

A honey bee nest is a valuable food resource for many predators, such as ants, wasps, moths, birds and mammals, including man. In natural (wild) colonies, the primary defence is to site the nest in a cavity with solid walls in a high position with a small entrance, which is easy to defend. Besides being in hollow trees, they are often found in chimneys, cavity walls and roof spaces.

The second line of defence for the nest is the bees themselves. Guard bees are recruited from house bees when they are about three weeks old at the time they are due to become foragers. The sting, its poison and the pheromones that alert and recruit other workers to nest defence mature with time. Bees are programmed to defend the nest at the expense of their own lives. This is the mark of a true social insect. Their existence is subservient to the needs of the whole community. Drones, fertile male bees, do not have a sting.

Guard bees at the nest entrance perceive a threat when an animal approaches too closely; the cues include nervous or erratic movements, rocking or vibration of the nest, threat to an individual bee or carbon dioxide from mammalian breath. Alerted bees may rear up with wings spread and mandibles open. They may partially extend the sting, which will release the alarm pheromone, isopentyl acetate, which is volatile and has a distinctive smell.(1)

Alerted bees may leave the nest searching for a predator. They go for movement, (e.g. blinking eyelids), dark colours, odours such as sweat and breath. When fully kitted out in protective clothing, including Wellingtons and rubber gloves, hot smelly areas are to be found on the legs, just where the trousers tuck into the top of the boots and at the wrists above the glove cuff. Also at these sites the clothing is constricted, so stings may penetrate to the underlying skin more easily.

A bee may not sting the predator immediately, but harass it by buzzing, headbutting or burrowing into hair, which it may pull or bite before going on to sting. Once stinging begins, the pheromones released will attract other bees to the fray and to the site of the sting. Venom will dry on the protective clothing regularly worn by the beekeeper and this may have two effects. The first being to elicit the sting response on the next occasion one is tending the bees. Secondly, inhalation of venom dust by the family of the beekeeper may sensitise them to the venom, even though they have not been stung.

The Sting

The sting apparatus is a marvellous structure with many parts.(2) Once programmed to sting by the bee's nervous system, it will keep going even when detached from the bee. The venom is elaborated in two long secretory tubules and collected in the venom sac, where it is stored ready to replenish the bulb of the sting from where it is pumped down the venom canal into the victim. The sting itself is made up of three parts, a stylet with grooves in which slide two barbed lancets, the three together forming a tube: the venom canal. Within the bulb each lancet has a valve shaped like a scoop. Muscles acting on the plates attached to the upper end of the lancets protract and retract the two lancets in reciprocal fashion. As a lancet is advanced, the valve opens, forcing venom down the canal. The barbs anchor the lancet in the dense skin of mammals. As one lancet retracts, the other lancet advances, driving the sting ever further into the victim. The valve on the retracting lancet closes as it is re-positioned ready for its next advance. Once the sting is firmly anchored, the bee can only escape by tearing itself free. This leaves the abdominal cavity open to leak haemolymph. The bee does not die immediately, but is still able to fly and join its nest mates, harassing the enemy. A lingering death follows. The dose of venom delivered by the bee is sufficient to kill another invading insect, such as a wasp, directly. To kill a human not sensitised to the venom, requires hundreds, if not thousands, of stings.

The Venom

Venom is a clear, acidic liquid, which tastes bitter and smells of ripe bananas.(3) It is a watery solution containing a complex mixture of substances. The main active compon-ents are the enzymes Phospholipase A2 (about 12% of the dry weight), hyaluronidase (3%), acid phosphatase (1%) and peptides mellitin (50%) and much smaller amounts of mast cell degranulating peptide (MCDP), the neurotoxin apamine and histamine. This mixture has the potential to elicit a pronounced allergic response. The main components contributing to this effect are the enzymes and mellitin.

Mellitin is the main toxin of bee venom. It destroys both blood cells and tissue cells by drilling holes through the cell wall.(3) It is an allergen - that is, 'an antigen or foreign substance that induces an allergic response when it enters the body'. Mast cells are found in skin and mucosal surfaces (i.e. in the lining of gut, airways and lungs) and around blood vessels. They contain packets of histamine in the form of granules. Histamine is released when the allergen is encountered. MCDP causes 'degranulation' so the histamine can escape from the cell. It is this massive release of histamine from all the mast cells that causes the symptoms of acute anaphylaxis.

Phospholipase A2 digests cell membranes and works with mellitin to destroy cells. It causes release of inflammatory lipids and prostaglandins and is the major allergen in venom. It also causes abnormal blood clotting. Hyaluronidase dissolves the ground substance in connective tissue, allowing venom to spread through the tissues. It also allows serum to leak from damaged capillaries, causing the swelling (oedema) seen after the sting.

What is Allergy?

Allergy can be defined in several ways, but originally it was coined from the Greek meaning 'other energy' to describe 'an altered capacity of the body to react to a foreign substance'. Alternatively, it is a 'disease following an immune response to an otherwise harmless antigen', or even better, an 'excessive immune reaction against antigens that most people tolerate'.

When an individual is stung for the first time, they are non-allergic. They experience a local reaction. Pain felt first, is fiery, stinging and intense. There is immediate redness (erythema) and often a small area (up to 1cm. diameter) raised and pale, of oedema, the so-called weal and flare.(4) The pale area is where the leaky capillaries have allowed liquid to fill the tissue spaces, which have been squeezed, so blood only flows in the inflamed area. This first experience produces only trivial effects (apart from the child's noisy reaction)!

On a second exposure the central weal subsides, but surrounding swelling increases slowly over several hours. Gross swelling is most likely where skin is loosely attached to underlying structures, such as the head and neck. If a hand is stung the swelling may affect the whole limb. In a dependent part this can lead to blistering and sometimes secondary infection.(4)Such oedema is not dangerous unless it affects the airway. Stings on an eyebrow may cause sufficient swelling to close an eye for two or three days. Any swelling also subsides slowly. The itching, which accompanies the swelling is caused by the histamine, which has been released.

The Wound

The sting has inflicted a wound and the injected poison kills cells close to its point of entry. The sting is best removed by scraping it out – squeezing should not be done because this will force poison from the venom sac into the wound. The sooner the sting is removed the better, as pumping venom goes on for over a minute. At the site of entry a small hole or blood spot may be seen with a magnifying glass. This is surrounded by a purple mark, which over the course of a few days dries, goes black and eventually a small scab will separate leaving a pink scar which fades to white over a few months. These permanent scars are usually so small they go unnoticed.

In the next issue I will describe the immune response, which occurs after an exposure to an antigen. I will also explain how allergies develop and what we can do to treat them.

Seven Golden Rules to Avoid Being Stung (H M Pearson, 1956)5

1. Keep only docile bees that are easy to handle
2. Avoid cold, wet, thundery and windy days, especially for manipulations.
3. Be sure that there is ample food, readily accessible for the bees to gorge upon before opening a stock
4. Avoid being over-hot and bearing unpleasant odours about your body.
5. Adopt the minimum personal protection necessary to ensure freedom from worry without hampering operations.
6. Handle the combs of bees with firm, gentle movements, avoiding erratic or sudden gestures.
7. Tackle the bees with understanding and confidence. Do not keep the hive open for any longer than is necessary, decide beforehand what is to be done, then do not delay further, but get on with the good work.

To this I would add an eighth.

8. Wear a clean bee suit, and if gloves are worn wash them regularly to remove bee venom.

5) Pearson, H.M., "Bee stings and how to avoid them", British Bee Publications Ltd., 1, Gough Square, London, EC4. ? 1956.

Useful leaflets

The Anaphylaxis campaign, PO Box 275, Farnborough, Hampshire, GU14 6SX Tel. 01252 542029, Website http://www.anaphylaxis.org.uk

<u>Honey Bees: Genetic Labeling Decides Blue Blood</u>

It is hard to believe that they belong to the same species: The large, long-lived queen bee is busy producing offspring throughout her lifetime. The much smaller worker bees, on the other hand, gather food, take care of the beehive, look after and feed the brood – but they are infertile.

"The honey bee is an extreme example of different larval development," Professor Frank Lyko explains. Lyko, a scientist at DKFZ, studies how genes are regulated by chemical labeling with methyl groups. This type of regulation is part of what are called epigenetic regulation mechanisms – chemical alterations in the genetic material which do not change the sequence of DNA building blocks. This regulation mechanism enables the cell to adapt to changing environmental conditions.

Why are cancer researchers interested in bees? *"Cancer cells and healthy cells have identical genomes, but they behave very differently. To a large extent this is due to differences in the methylation of genes. Queen bees and worker bees also share the same genome, despite all differences in appearance. Here, too, methyl labels could be responsible for different larval development,"* says Lyko.

In a beehive, it is the food alone which determines the future of the off-spring: If the larvae are fed pollen, they develop into worker bees. If they are to grow into queen bees, their only food is royal jelly, which is rich in fat and protein. Australian researchers have recently imitated the effects of this power food by turning off the enzyme that labels DNA with methyl groups in bee larvae. These larvae all turned into queens – completely without any royal jelly.

This was a clear indication that it is methyl labels that determine the larvae's fate by influencing the activity of particular genes. In their current work, Lyko and his team have investigated which genes turn a bee into a queen. While previous epigenetic investigations concen-trated on the methyl labeling of individual genes, the Heidelberg researchers, jointly with bee experts from Australia, have been the first to compare methylation of the whole genomes of queens and workers. *"The bee with its small genome has served as a model for us to test the method. By now, we are able to perform such investigations also in the human genome,"* Frank Lyko explains.

Other than the richly methylated human genome, the bee genome carries considerably less methyl labels. In more than 550 genes the investigators found clear differences between worker bees and queen bees. These genes have often remained largely unchanged in the course of evolution, which is an indication for researchers that they fulfill important tasks of the cell. Moreover, Lyko's team identified a previously unknown mechanism by which gene methylation might influence character production. In bees, methyl labels are frequently found at so-called splice sites of genes where the blueprint for protein production is cut.

If these recognition sites are made unrecognizable by chemical labels, the cell may possibly produce an altered protein with a different function. *"So far, the theory has been that methyl labels block gene activity at the gene switches and thus produce diverging characteristics,"* Frank Lyko says. *"But now we have found evidence to suggest that the mechanism discover-ed in bees may also play a role in cancer cells."* This would mean that epigenetic factors in cancer not only turn genes on or off, but may also be responsible for production of proteins of a completely different kind.

Don't try this at home.

THE UNDER-RATED DRONE.

Drones are male bees. They take 24 days to develop from an unfertilised egg. They are raised in the spring and continue in the hive all summer. They live a life of idleness, waited on by their sisters. In the autumn they are unceremoniously turfed out of the hive to perish. Their only purpose in life is to mate with a virgin queen, whereupon they die, albeit in ecstasy. They are large, have big eyes, no sting and are allowed to enter any hive. This, in a nutshell, sums up the information about drones to be found in many bee books. Oh, and they are very useful for practicing various procedures on, such as marking and clipping. The same books will have chapters to say about the multi-tasking workers and as much about the highly specialised queen; the poor old drones get a paragraph or two. But in their way they are just as important as the queen after all they provide half of the workers genetic make up. Most drone information is to be found in more specialised books on anatomy, biology etc, and in reports of research carried out into mating behaviour. I have tried to put together from many sources a summary of all the relevant drone data I could find. It is fascinating!

The Nursery

In very early spring the queen recommences laying after the winter break. Her eggs are parthenogenetic, i.e. they will hatch without first being fertilised. However, a fertilised egg can produce either a sterile female worker bee or, if fed correctly, a queen bee. Unfertilised eggs result only in male bees. Only worker eggs are laid at first. As the colony grows in strength, drone eggs will appear, some six to eight weeks before any swarming will occur. This ensures that there is an abundance of mature drones when the first virgin queens appear. This production of the male element before the female is called protandry, although the term is more usually used with reference to hermaphroditic species and plants. Drones are substantially larger than worker bees and need a bigger cell, both in width and length, to mature in. The workers build these cells mainly on the periphery of the brood nest - it is surmised that drone larvae prefer slightly cooler temperatures. Also, if there is a sudden cold snap, and the cluster has to contract, causing chilled brood, drones are more expendable than workers. In a crisis, the first to be ditched are the older drone larvae. Some say that the queen is shepherded to these cells when the workers ‘think’ it is time to start raising drones. It is believed that she measures the diameter of each cell with her forelegs and so knows whether to lay a fertilised or unfertilized egg.
The life cycle of the drone is well catalogued. As a larva, he needs substantially more food than a worker does, and there appear to be differences in the composition of this brood food, drone food having more diverse proteins. The older larva is also fed a food with a different ratio of carbohydrates, vitamins and minerals to that given to a young larva. When ready to pupate, his cell is capped with a domed cover, giving him even more room. He takes twenty- four days to mature before hatching, compared to the twenty-one needed by workers. (It is this extra three days pupation that makes drone brood so attractive to varroa mites-they can usually produce another generation in that time.)

Jack the Lad

Once hatched, our drone then does no work in the hive, having no specialised parts to perform any tasks in the hive, although his furry body must help with temperature control. He is fed by his sisters at first, on a mixture of brood food, pollen and honey. Sperm production does not seem to be affected by the amount of protein given, though longevity and mating ability may be. An older drone will then help himself from open honey cells, to power his mating and orientation flights. (A resting drone requires 1-3 mg sugar per hour, a flying drone needs 14mg/hr, rather more than a worker.) Once he is old enough to fly he will take orientation flights, but cannot do any foraging, as his tongue is short and he has only a slender honey stomach and no pollen baskets.

You are not likely to find a drone sitting on a flower! Although he can make an intimidating buzz when aroused, the drone has no sting and cannot defend the hive. Virtually all the glands and external adaptations of the worker bee are absent or vestigial in the drone. However, his specialised parts needed to perform his prime function of mating, are highly developed. His eyes have 7- 8000 facets, compared to the 4-7000 of the worker. His sense of smell is greatly enhanced by the 30,000 antennal plate organs, carrying odour and other receptors.(worker bee has 3000). He has very strong wing and abdominal muscles and impressive reproductive organs.

Haploid/Diploid

Queens can lay fertilised or unfertilised eggs. Fertilised eggs contain two sets of chromosomes, one from the queen and one from the drone whose sperm fertilises the egg. These eggs are called diploid and hatch into females. Only their subsequent nutrition determines whether they become workers or queens. Unfertilised eggs have only one set of chromosomes, from the queen, and are called haploid. These eggs hatch into perfect males, or drones.
A drone has no father, but he does have a grandfather. The laying of diploid drones seems to be more common if inbreeding has taken place i.e. the queen has mated with a closely related male(s). A sibling mated queen can produce up to 50% diploid drones. *(Woyke)* It can be so prevalent that many cells lie empty, causing a pepper-pot appearance on the comb.

The Man-about-Town

A drone takes about a fortnight from hatching to become sexually mature. From then, in an average life of four weeks *(Winston)*, he will fly out every day, usually in the afternoon, between 2pm and 6pm, when it is warm enough, at least 16°C, and preferably much warmer. He flies to a gathering of drones in the sky, known as a 'drone congregation area' (see below), there to await the arrival of virgin queens. If 'lucky', he will mate with a virgin, dying as a result. If unlucky in love, he will return to his own, or a different colony, where he will be easily accepted. In an apiary of several hives you can test this by marking some drones and seeing where they turn up. They definitely seem to prefer hives with plenty of food or virgin queens in them. (It is quite rare to find drones in small observation hives) A hive with a virgin queen in it acts like a magnet to drones - even a small nuc may have a whole frame of them. Once the queen has mated they mostly vanish. Presumably this must, in pre-varroa days, have happened in the wild, even though colonies would have been much more widely separated than in domestic apiaries. It ensures that genetically diverse drones are on the spot when a virgin leaves to mate. Although a lot of research has been carried out into drone behaviour in DCAs, no one has yet satisfactorily explained why the DCAs occur in certain places, and even more mystifying, why they persist in the same places year after year. (The DCA referred to by Gilbert White is still in use today.) Virtually all drones die in the previous autumn, so how do the new drones know where to go? Light distribution and the contour of the horizon seem to play a part in choosing a site *(Pechhacker 1994)* and Zmarlicki and Morse determined that most DCAs seem to be located over an open area of land of about a hectare, protected from strong winds. Obstructions such as high buildings and tall trees are avoided, but not all open spaces are used.
The flyways connecting the DCAs tend to follow lines of trees or hedges, etc . There may be several DCAs adjacent to each other. One study showed that a 10 sq k. area next to an commercial apiary contained at least 26 DCAs and 18km of flyways. Based on radar images a DCA was defined as an area approx. 100m in diameter, where the drones fly at a mean height of 25m - it depends on wind velocity. The stronger the wind, the lower the drones fly. Many drones seem to stay faithful to one DCA, but may visit another in the same general direction. Two to three km seems to be an average distance for a drone to fly, but they have been known to travel up to six km. For a queen rearer wanting pure matings from a mating apiary, it seems that this is the minimum distance there must be from any other hives, or else a physical barrier of 500m or more must be present.The parentage of a sample of drones was tested in Germany in 1998, and the conclusion reached was that all the colonies in the area seemed to send roughly the same proportion of delegates to the meeting, thus minimizing the chances of inbreeding. *(C. Collinson, Bee Culture, Sep. 2008)* Because mating takes place in flight, it is difficult to observe. Modern technology such as radar, combined with the technique of tethering a virgin queen to a moving line, has shown drones detecting a virgin forming a long comet- shaped tail behind her. Recent studies have shown that the drones find the virgin primarily by smell. One of the components of queen substance, called 9-ODA, attracts drones during mating flights. *(Apis UK, July 2008)*. However, it has also been noticed that drones will momentarily chase anything that moves, butterflies, dragonflies or a thrown stone, so presumably eyesight plays a part as well. Drones have to be very fit and well developed to mate with a queen. In addition to the excellent flying power needed to catch the queen, they must have ample supplies of spermatazoa, as only a fraction of each ejaculate will migrate to the queen's spermatheca. *(Woyke and Jasinski, 1973)* In a series of studies made by Duay et al, in 2002, it was shown that the effects of parasitism by *Varroa destructor* in the larval stage, could seriously affect the drones ability to mate. A significant reduction in drone body weight resulted from invasion by only one female varroa mite, and two or more mites reduced drone life expectancy so much that sexual maturity was seldom reached. Varroa parasitism by only one mite hardly affected flying power but sperm production was reduced by 24%. In those drones that survived, two female mites invasion resulted in greatly reduced flying power and a sperm reduction of 45%. Other interesting facts to emerge are (a) Drones like it hot. Flying to a DCA and gathering enough drones to form a comet only occurs at 18°C or above. (b) They are very good time keepers, generally flying between 2pm and 6pm. This varies according to the weather. (c) Drones returning to the apiary outside these times were not interested in a queen. (d) Maximum flight height in flyways is 21m, but in DCAs it can reach 50m. (e) Drones can make several trips to a DCA in an afternoon, returning to the hive to refuel when necessary. Each mating flight lasts about 30 mins. (f) The number of drones in a DCA can vary enormously, from hundreds to thousands. (g) Usually, 7 to 11 drones will mate with a queen. About 90 million sperm will be deposited in her oviducts, and a mixture of about 7 million of them will be stored in her spermatheca.

Mating

The actual process of mating has now been documented quite thoroughly. A drone mounts a queen and inserts his endophallus and ejaculates his semen. During ejaculation he falls backwards and his endophallus is torn from his body, remaining in the queen. Any subsequent males mating with the queen dislodge the previous drones endophallus and leave their own in its place. The drones die quickly with their abdomens ruptured in this fashion. The queen returns to her hive still carrying the endophallus of the last male to mate with her. Beekeepers call this the 'mating sign' It will be removed by the nurse bees. The process is described very clearly in 'The Biology of the Honeybee' by Mark Winston

The Down-and-Out

Once the mating season is over, the 'raison d'etre' of the drones is gone. Only in queenless or very well provisioned colonies will some be allowed to overwinter in the hive. There is no sentimentality in nature, and drones with no function to perform are simply a drain on valuable resources, ie honey stores. In the autumn they are refused entry to the hive, or have their wings bitten and are forcibly ejected, to die of cold and starvation.

BIBLIOGRAPHY:

'Bees, Biology and Management' by Peter G. Kevan.
The Biology of the Honeybee' by Mark L. Winston
'Anatomy and Dissection of the Honeybee' by H. A.Dade.
'Bee Genetics and Breeding' edited by Thomas Rinderer
'Drone Congregation Areas' by C. Collison. (Bee Culture, Sep 2008)
'Beekeeping' by Kim Flottum
'Pheromones of the Social bees' by John Free.
'The Honey Bees of the British Isles' by Beowolf Cooper

Did You Know?

"Unlike honey bees, stingless bees transport large amounts of honey, pollen, and cerumen* from the mother hive to future nest sites before swarming (Kerr and Laidlaw 1956). Nogueira-Neto (1954, cited in Michener 1974) demon-strated this transfer of food stores by coloring honey in the mother nest and observing the appearance of the dye in the honey pots of the daughter colony. Relocation of these resources apparently increases the probability that daughter colonies will succeed."

*Note: Stingless bees construct their nests with cerumen, a mixture of wax that the bees secrete and sticky resins collected from trees.
~ "Worker bees construct the combs of cerumen, a mixture of wax and plant resin. Most species of tropical stingless bees build inner walls of thin, paper-like cerumen that contain a number of tiny holes as passageways inside the nest. Some species construct long entrance halls. Remodeling of the nests goes on continually. Used cells are rebuilt; walls are moved and the locations of entrances."

What is the June gap?

How do you know it exists in your area?

The June gap is a foible of Mother Nature whereby the spring flowers (early hardwood trees like sycamore and horse chestnut, fruit trees, hawthorn, oil seed rape) cease flowering before the summer and late summer flowers start.

The spring flowers tend to finish in the first half of June and the summer flowers (clovers, brambles, lime trees) will not be flowering freely until July. Some of the shrubs are more helpful in this respect and keep going into summer. These include the Cotoneasters (C.horizontalis is a great favourite of bees) and the Pyracanthas. In this respect town and city beekeeping is rather safer than country beekeeping as there tends to be a larger spread of these shrubs in towns. In an idle moment I once strolled the residential roads and avenues of Bathgate noting down the patches of Cotoneaster and their approximate size and in nine streets came up with a composite count of almost a tenth of an acre of flowering Cotoneaster – a worthwhile bee feed, (our own garden surprised me with 14 square yards). If you've got some spare space fill it with horizontalis – it'll also keep the weeds down or at least hide them. My count included 51 lime trees and 52 sycamores which had mostly been planted for street shading – a quantity boding well for spring and summer foraging. Areas in the east of Scotland where oil seed rape is a common farm crop, sometimes have flowers into summer, if the farmers have been caught out by the weather in autumn and have failed to get their winter rape sown. Spring rape is then sown and of course flowers later.

You can usually determine whether or not there is a June gap by watching the beehive entrance – if there is little activity, no pollen being taken home, then it is likely that there is a dearth of flowers. In this case and especially if the weather is inclement, the bees may run short of food – a full sized colony should always have sufficient stores or 10 days about 5kg (11lb).

A very full BS deep frame holds about 2¼ kg (5lb) of food, so at least two full frames of food (usually the two end frames). Normally there would also be some food in the super. However if the June gap is severe and the weather is inclement, check your bees for food and if in doubt e.g. the super is empty and hardly any food in the brood chamber, remove the super and put on a rapid two litre feeder of sugar syrup (0.8 litre water to 1 kg sugar – equal volumes water and sugar).

Beware the June gap and never be reluctant to feed your bees in summer if necessary.

CLEARING SUPERS, USING PORTER BEE ESCAPES

The Porter Bee Escape 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 that robber bees cannot get in and pinch all the honey! Ed)* 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 additional 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!

——

THE BEEKEEPING WIDOW.

"One odd thing about our family is that we keep bees. A beekeeper's wife endures cheerfully the impact of bees upon the household. Less noble-minded women might object to having spare hive parts stacked in the kitchen all winter, honey extractors and storage tanks all summer, but not she; she likes it, and takes as a matter of course a husband who dives into the kitchen with desperate urgency (unrecognisably swathed in veils) selects the best coals from the fire, drops them into the bottom of the smoker and departs wordlessly in clouds of smoke from evil-smelling old sacks.

The kitchen fire now being out, she sets to work to re-light it. Where are the matches? Ah! There they are upon the mantelpiece. Why does she open the box so warily? Horrors! A sizzling sample of bees, all alive-o – taken for disease diagnosis! With the eternal wisdom of women she had known it all along, the matches are in the beekeeper's pocket, lest the smoker should go out. Some beekeepers are said to keep hives of bees under the bed during winter months, but my husband does not go beyond having a spare queen bee in his pyjama pocket at night to keep her warm. Life never being without its compensations, we have the bees to thank not only for pots of stored summer fragrance when the winter days are long and dark, but for many happy picnic days in high summer, up-country with the children, when the hives are moved to their summer quarters on the heather moors.

Our favourite place is Dinnet Moor, with its bell heather and two small lochs, thirty-five miles up the river Dee. These occasions mean long hours of hard work for my husband. He deposits us like so much luggage near one of the lochs, and heads for the hives, only re-appearing at rare intervals to feed the inner man.Now the day is ours. The children paddle and splash on the sandy shore of the loch against a background of water-lilies and purple-red heather. I search out clusters of orange chanterelles, grass-hidden, under the fringe of silver birch trees. They are more delicious than mushrooms and can be dried on strings for winter use. Fish leap; swallows sweep and dip in the blue above us. The air is filled with the thin, melancholy cries of the black-headed gulls whose favourite nesting place this is. Halcyon days, except for midges. We retreat at last to the car, and wind up the windows. "Please, please come now, before we all suffocate."

But the highland summer days are long, and if he makes full use of the daylight it may be nine or ten o'clock before my husband has finished with the bees. I put the boys into pyjamas, settle them to sleep with pillows and rugs, and take out my sewing.

My husband's voice startles me from slumber. "Sorry to keep you waiting, dear! I've been fighting those ruddy bees for eight hours. Got anything to eat? Just see whether there are any bees on me."
With a thumb and finger I flick off half a dozen from his back.

We drain the flasks and finish up the tired sandwiches. Home at last, ten forty-five! What an hour to have young children out. Disgraceful. We lift them, still sleeping, into their beds. It won't do them any harm to go unwashed for once."

Holidays

Tired with the noise and pollution and the same old Costa Holiday?????Then why not try a different Costa Holiday.

Come to Costa Geminiano

An Italian Rustic Farmhouse in the mountains of Emulia Romagna Province of Parma

The property is situated at 650 metres above sea level on the edge of a small quiet village amid beautiful unspoilt Countryside. The nearest town Bardi is 12km away.

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

RHUBARB LEAVES TO KILL VARROA. REPORT FROM POLAND!

The rhubarb leaves, together with their stalks, are put on the hives at the time of adding the first supers, which here is in May. The large stalks have to be crushed first with a hammer, and the leaves are placed between the brood and the honey super.

After three or four days it will be seen that most of the leaf between the veins will have been removed by the bees, and eventually all that will remain is its skeleton. The worker bees cut away all the soft and thin parts of the leaves and throw them out of the hive, because it disturbs them.They just should not be there as far as the bees are concerned. With in the humid hive, rather than drying up the leaves released oxalic acid in a gaseous form which circulated around the hive. In spite of very small doses of oxalic acid some of the Varroa mites were found to be dead on the floor. From the 15th June up to August we gave rhubarb leaves to colonies five times, the last time being the 16th August.

We gave rhubarb leaves to all 70 colonies in our apiary and the results were encouraging. To monitor mite fall we used stiff pieces of paper smeared with pig fat on the floor.

The results of this research are very interesting because it shows that using rhubarb leaves in summer does to some extent reduce the population of Varroa mites. The evaporating oxalic acid fumes within the brood nest helped to reduce the build-up of Varroa at a critical time when the colony is particularly vulnerable. A smaller population of Varroa mites in the colony during the summer allows normal autumn treatments to be more effective, and more healthy winter bees will be produced.

Often a high population of mites in autumn despite the winter treatment can cause a colony to be to weak (from a lack of young winter bees) to successful winter. In fact due to varroa and the virus they vector, by autumn many colonies are at the point where it is impossible to rescue them from certain collapse.

The National Veterinary Research Institute Poland, Test Report No P/16/28138.

By using rhubarb leaves, the low concentration of oxalic acid means that any hive products will not be poisoned.

Next year we plan to use the rhubarb leaves10 times beginning 15 May finishing 15th September this is in Poland!