

Cheltenham & Gloucester Branch, Gloucestershire Bee Keepers' Association

Swarming Handbook

Introduction

Swarming is an inevitable and essential part of honey-bee behaviour. In the past beekeepers have tried to eliminate swarming – and failed! Especially in urban areas, swarming can be a nuisance to both the beekeeper and the general public. For the beekeeper, loss of a prime swarm can rule out much chance of securing a honey crop. For householders, while arrival of a swarm can be an exciting and educational experience, there can be a risk to bystanders and the adoption of a chimney or hollow wall by the bees can create a nuisance. In some cases the only solution is to destroy the bees. This handbook is intended to assist both members (particularly new beekeepers) and the public in dealing with swarms and swarming.

In view of the large number of calls involving wasps, solitary bees, and bumble bees, some information on these is included.

What is meant by a swarm

People who are not familiar with honey bees often confuse large numbers of flying insects with honey bee swarms. 'Swarms' of midges are not usually confused, but wasps pouring from a nest after it has been clipped by a hedge-trimmer or dozens of bumble bees searching for their nest after it is disturbed by a gardener, can be frightening – both wasps and bumble bees sting, although bumble bees rarely do this unless their nest is disturbed. Only honey bees form true swarms.

Why honey bees swarm

Strong and healthy colonies swarm to reproduce the colony, to disperse locally, and to escape from pests and diseases. When conditions are suitable, the colony starts to build a few or many queen cells in which daughter queens are raised. If unchecked, a prime swarm will emerge when the first queen cells are capped, about 8 days after the egg is laid. In good weather one or more after-swarms or casts will emerge, further weakening the original stock, but giving the colony the chance of multiplying exponentially.

We still do not know enough to always predict when bees will swarm. Factors that may play a part are over-crowding, lack of space for the queen to lay, an old queen, the strain or genetics of the colony, or a nectar flow coming to an end. The mechanism of communication within the colony by pheromones is now fairly well understood. *Queen mandibular pheromone* is passed from the queen to the workers while *Queen tarsal pheromone* is deposited on the comb where it can be detected by the workers. If workers pick up both pheromones then production of queen cells, and therefore swarming, is inhibited.

Types of swarm

Emergence of a large prime swarm is a wonder of nature. Even a small cast can contain sufficient bees to create a large effect. These true swarms usually occur during late April to mid-July and typically emerge about the middle of a warm day.

Worker bees sometimes leave the hive when a virgin queen goes out on a mating flight; it seems that these mating swarms can sometimes become disoriented and fail to return to the hive. These swarms may not follow normal behaviour.

Workers in true swarms normally emerge after gorging on honey and are very docile; bees in abnormal swarms may be quite the opposite! There seem to be more reports of anomalous swarms than ever before. Anecdotal evidence suggests that bees may be responding to adverse conditions in the hive. Tropical strains of bee have a stronger tendency to abscond than temperate strains, i.e. more or less the entire colony abandons the nest or hive, perhaps in response to fire or predators. Late swarms about mid-August

may be the result of the beekeeper using some *Varroa* treatments which irritate the bees and cause them to abscond. Other irritants might be high *Varroa* loads or contamination in wax foundation.

Another anomalous situation occurs when a swarm is collected during the day (perhaps by a pest controller more interested in payment than doing a proper job) and a portion of the flying bees are left behind. The orphan workers will not stay in a hive and try to cluster until they are killed by bad weather.

Remember that a queen will leave a scent (the footprint pheromone) wherever she has been. Workers will cluster on a branch or something like a used queen cage long after the queen has moved on.

The value of swarms

Beekeepers have traditionally valued swarms highly; once hived a strong swarm will work hard and draw out good quality comb and may give a honey crop in the first season. Nowadays, swarms must be treated with caution and it is good practice to quarantine swarms away from the main apiary until they have been 'proved'. The greatest risk is that the bees carry American Foul Brood (AFB). Remember that this is a notifiable bee disease and that the only (and legally enforced) treatment is total destruction of the colony. There has recently been a case of a beekeeping association helping beginners collect a swarm which was eventually diagnosed with AFB. Eventually, the infection was traced back to a wild colony that had swarmed several times, but not before stocks had been distributed among members and caused a serious outbreak! Only beekeepers that can be relied on to inspect the brood regularly and recognise early signs of AFB should be dealing with swarms. Pam Gregory has written an excellent article covering this issue [Bee Craft, October 2010, Vol 92, No 10, pp 30-1]

How bees swarm

Even if the beekeeper is unaware of when his bees will swarm, the bees 'know' that they are preparing to swarm. Scout bees will search for suitable nest sites and this behaviour may be observed, especially where bait hives have been set up by a canny beekeeper. Sometimes a householder becomes aware of this scouting activity which can become quite intense with some workers 'loitering' in a potential nest overnight.

When the swarm is triggered, a large proportion of the workers leave accompanied by the queen which has slimmed down and so is able to fly. About 70% of the swarm consists of young bees less than ten days old. The movement of the swarm is largely controlled by the scout bees; the queen does not lead. On leaving the hive, the swarm will usually hang-up on a shrub or tree. The exact position seems to be determined by where the queen settles, with the workers responding to her pheromones; but swarms clearly favour certain foliage types and certain heights, and an experienced beekeeper can learn where swarms are more likely to be found. Usually, the workers form a cluster around the queen and then form the distinctive 'rugby ball'. In this state the bees are easy to collect. Sometimes the bees cluster but form separate strands and this might indicate that there is more than one queen – perhaps after-swarms with virgin queens have emerged about the same time and coalesced.

If bad weather sets in, the cluster may hang-up for several days; workers may begin to consume their honey stores and may become bad-tempered. If all goes well scout bees perform wobble dances on the surface of the cluster and recruit workers to their preferred nest site. It is thought that when all workers have been recruited to one dance the swarm is ready to move to its new permanent home; thus every worker 'knows' where it is going. In this phase the swarm may travel a considerable distance – easily several kilometres. If the swarm has chosen a nest in an inaccessible place (e.g. behind an air-brick in a wall) then, once the queen has entered, and particularly if comb is built and eggs are laid (easily within

24 hours of arrival if the queen is mated), it will be extremely difficult to dislodge the swarm.

Swarm Control

Numerous methods have been devised by beekeepers to control swarming. Some, such as killing the queen, or taking out a few frames, can be effective but are brutal and disrupt rather than manage the swarming tendency. The best methods mimic the natural swarming process: the beekeeper carries out an artificial swarm. The principle is to separate the queen with most of the flying bees from the brood with sufficient house bees to maintain it. Good methods should allow a new queen to be raised so that the beekeeper can replace the old queen with a newly-mated daughter. Pagden published his methods about 1870 while Snelgrove gave a comprehensive account of various methods based on his Snelgrove board in 1934. Since then, simplified techniques using less-complicated swarm-control boards have been developed.

Know your queen cells

Swarm queen cells are usually found on the sides and bottom edge of brood comb. Depending on the strain of the bees, they may produce just a few or dozens of swarm cells; remember they can be built in odd shapes squeezed into corners. Some strains of honeybee tend to supersede queens rather than reproduce by just swarming. There is usually a single supercedure cell near the centre of the comb which is large and strongly sculptured. Emergency queen cells are built from worker cells rather than queen cups and so 'droop' from the comb; they may be quite small and be easily overlooked.

Swarm deterrence

The beekeeper can reduce the likelihood of their bees swarming by giving space to reduce over-crowding, and replacing old queens by queen rearing. Beginners may induce swarming by over-enthusiastic manipulation – so open the hive for weekly inspections only – do not be tempted to 'show-off' your new-found skills at the expense of your bees. Someone worked out that 2lbs of honey production is lost every time the hive is opened! Bees are sometimes reluctant to move through a queen excluder and occupy a super fitted with foundation; they thus become over-crowded in the brood box – and swarm! Early in the season the super may be placed over a crown board or the bees given full access to the super. The queen excluder is inserted once the bees are drawing comb.

Clipping and marking queens

In early April the queen should be clipped and marked. Marking makes it easier to find the queen on the comb, easier to spot her in a swarm, and allows the beekeeper to determine whether she has been replaced. A proportion of collected swarms are found with a clipped queen which is still able to fly, so the entire membranes of the wings on one side almost to the root should be removed. If an open-mesh floor is used and the queen is clipped, then it is worth arranging the hive with a space beneath the floor. If a swarm 'gets away' then the queen often walks back under the floor and the queenless swarm returns and clusters on her. The busy (or lazy!) beekeeper can then create a belated artificial swarm with a good chance of success.

By always clipping queens the beekeeper applies a selection pressure favouring supersedure. For beginners who have yet to learn to pick up a queen and clip her safely, the fail-safe method is to use a press-in cage. Workers must be excluded and once the queen is trapped the cage is pressed down in front of the queen. She will then back away and a wing will pass through the mesh. The cage is pressed down to immobilise the queen and fine scissors used to clip one forewing. She can be marked at the same time, but do not allow paint to spread to wing and leg joints! If the queen is removed from the comb do not drop her back on (the workers may react as if she is an intruder and kill her); clear workers from

the comb with smoke, place the queen carefully and when she is walking on the comb and dives between frames allow workers to approach.

Cutting out queen cells is not a clever way of preventing swarming. It should only be used when queen cells are found but the beekeeper does not have equipment to hand to deal with the situation. Bees can raise an emergency queen from a 36-hour larva, thus the old queen can leave when a cell is sealed only three days later. Repeated cutting out may induce a swarm to leave before queen cells are sealed.

Equipment

It is impossible to properly manage bees without spare equipment. If the beekeeper simply collects swarms then complete hives will be needed to house them. To ensure swarming can be dealt with effectively, there should be a spare brood box and frames of foundation for every stock, with a nucleus box for every 2 or 3 colonies. A division board modified from a crown board with a hinged entrance on one side and which can have pieces of queen excluder fixed over the holes for each colony greatly assists coping with swarming.

Pagden methods

Pagden's original idea involved driving bees from a skep in which open queen cells were found into a second, empty, skep placed above. The beekeeper judged the proportion of bees to be left with the brood and tried to make sure that the queen moved up with the artificial swarm. The new skep placed on the original stand attracted the flying bees, while the original colony in the old skep with brood and queen cells was moved to a new site. This method can be adapted in various ways, with the hives being swapped so that flying bees join the new stock as they emerge from the old brood. The bees in the depleted stock will not be strong enough to swarm and should break down extra queen cells.

One modern Pagden system - when the colony is found to have occupied (i.e. open) queen cells, place the queen on a frame of sealed brood in a new brood box made up with foundation or drawn comb on the original site. Move the old brood box away and select one open queen cell. After 7 days check both boxes for queen cells. The old queen should be laying eggs in new comb; if queen cells are being made then the old queen is failing (or has already disappeared) and this colony can be allowed to raise a queen from a selected queen cell. There will probably be emergency queen cells in the old brood box; check that the selected queen cell looks OK and remove the other queen cells. Run both colonies through the following winter then re-unite for the early nectar flow. If the original queen has survived, then she is replaced at this stage.

The Snelgrove board

This was a crown board with a central hole covered in mesh and with six hinged entrances in pairs on three sides. After separating the brood from the queen and flying bees by placing the old brood box above the board on top of the supers, newly emerging bees were bled from the top box by switching the paired entrances in succession so that bees flew from the upper entrance but eventually returned to the lower and thus joined the main stock. This technique required several visits and so was labour-intensive.

A modified Snelgrove method - this requires a crown/ division board with a double entrance on one side and a single entrance on the opposite side. If the queen is found she is placed on a comb without queen cells and one other in a new brood box made up with foundation on the original site. Put all brood and bees into a second brood box. Rebuild the colony with a queen excluder, the supers and then the Snelgrove board with the front upper entrance open. Place the second brood box on top and close with crown board and roof. [If the queen is not found shake all bees into the bottom box and leave out the Snelgrove board; return after one day when the housebees will have migrated up to the brood and insert the Snelgrove board as above.] After ten days close the front upper entrance in the board, open the front lower entrance, and open the rear upper entrance. The flying bees

that have used the upper front entrance will return to the lower chamber and join the old queen. After five weeks check for new queen and brood in the upper chamber. If the split was done early in the season the two colonies can be united with the new queen for the start of the main flow.

Gloucestershire high-rising - This method can be used to produce a single three-frame nucleus in which a new queen is raised. If queen cells are found the brood box is moved to one side and a new brood box put in its place. One frame of young brood with attendant bees is placed in the new box and closed up with two frames of foundation. Most of the bees are shaken off the frames in the old brood box but the queen must be kept in it. The old box is placed on top of the supers above a division board as described above.

After 7 to 10 days the boxes are transposed. The single frame should now have queen cells which can be cut down to one to raise a new queen

Mike Hunt's method – the hive should be opened and the brood frames examined every 7 to 10 days. Look for queen cells. It is futile to cut these out; there is a high probability that sealed queen cells will be found at the next inspection – the swarm will have gone!

The original box is moved to one side and a new box with foundation put on the stand. All bees are shaken onto the foundation; there is no need to look for the queen – she will be there somewhere! All queen cells are removed from the now bare frames of brood. The old brood box is re-assembled and placed above the supers; nurse bees will migrate up within an hour. Ten days later return and there should be sealed queen cells built from larvae in this top box. If new queens are raised by other means all these queen cells can be removed, otherwise one can be used to raise a replacement queen. This can be done by making a nucleus and returning the parent hive to the normal state.

An alternative method is to find the queen and place her on a single comb of brood (with no queen cells!) in the bottom box. The emerging bees can be bled down from the top box using a Snelgrove board, or a division board used to separate this top box which can be used to raise a new queen. The hinged entrance is opened to allow the new virgin to fly and mate.

Going on holiday

If the beekeeper is going away during the swarming season loss of swarms can be prevented by inducing swarming. Ten days before you go away take a nucleus from the parent hive. This should include the queen, brood in all stages, and stores. Depending on the length of the holiday and the likely weather, a larger (6 frame?) nucleus made up with one or two frames of foundation may ensure that the nucleus can develop. Three days before you go away return to the parent hive and cut out all but one of the queen cells. Enjoy your travels! If there is a likelihood of a strong nectar flow occurring during an extended absence, then space left in the brood chamber should be filled with frames of foundation or a dummy box to avoid bees drawing wild comb there.

Collecting swarms

How to collect a 'classic' swarm

These instructions are for the benefit of beginners who have never collected a swarm and do not have the benefit of a mentor or expert. It is worth collecting a 'kit' so time is not wasted getting organised when the call comes. Apart from basic beekeeping items (suit, smoker and hive tool) the first need is something in which to collect the swarm. A traditional straw skep is ideal but a strong cardboard box approx 35cm cube is equally good. Contrary to what the books sometimes say, the bees may be put into a hive straight away. A white bed sheet can be used to wrap everything for transport. Every beekeeper should carry a queen cage in their pocket at all times, while a water spray has several uses. Secateurs and loppers can be useful to clear foliage or just to remove the clustered swarm. Ladders and ropes, extension poles for secateurs, brashing saws or hooks, can all be useful.

Before actually doing anything, observe the situation as closely as you can. Occasionally, the beekeeper discovers a 'swarm' hanging in a tree which turns out to have become an established, open-air, colony complete with combs of brood and stores. The traditional 'sharp knock' can break the combs and make it extremely difficult to recover the bees (see 'dealing with established swarms/ colonies' below).

If the swarm is clustered on a thin branch, and the skep/ box/ hive can be placed directly beneath, then a sharp strike will knock the entire cluster into the receptacle. If this is a brood box, frames of foundation can be left at the sides and remaining frames dropped on top of the bees. Within seconds the bees will start hanging up on the foundation. If bees return to the branch and re-cluster they can be dropped again. Check that the queen is not still on the branch and spray the entire area with a water mist to cool the air and reduce scent. If cutting the branch will not cause problems (check with the landowner first) it may be easier to cut the whole branch; this can be helpful if the cluster is high up. If the cluster falls or breaks look out for the queen; if she is spotted she can be caged and the workers will cluster round her; place the caged queen inside the hive and watch the workers fanning. It is bad practice to move a swarm during the day so that flying workers are left behind. Wait until flying stops and move the hived swarm to its permanent stand the same day. If the swarm is collected at the home apiary this move can be any distance; but if there is any delay then the usual (2/3 ft – 2/3 miles rule applies). Feed the swarm after three days by which time the bees will have emptied their honey sacs and incorporated any infected honey in new wax.

Tricks and shortcuts

The more the beekeeper understands honeybee behaviour the more ways will be found to manage swarms. It is impossible to describe every situation that a honeybee swarm will create; the beekeeper must deploy available resources as quickly and efficiently as possible. One resource is the so-called expert. Unfortunately, by the time the team is assembled the swarm may have departed or the problem become more intractable.

With some experience, most beekeepers can spot the queen among flying or clustering workers. When a swarm first lands the queen may alight away from the centre of activity and can easily be caged; the swarm can then be managed simply by placing the caged queen inside a nucleus box, skep, or whatever. If the swarm has clustered in a difficult place, it can be dislodged in the hope that the queen will then be found. For example, it might be easier (and safer) to knock down a swarm that has settled high in a tree than to climb the tree. With luck, when the cluster of bees hits the ground the queen might be spotted, as she often runs over the clustering workers who seem to facilitate her passage, and she can then be caged, although things might be arranged so that the cluster drops straight into a hive or a hive is placed so that it crawls in.

Dealing with established swarms (really, these are new colonies!)

Very soon after a swarm has entered a cavity such as a hollow behind an air-brick, workers will start building comb. If the queen is already mated, then she will probably have laid several hundred eggs within 24 hours. It is then extremely difficult to shift the bees with smoke. If the swarm has only just entered the cavity, then vigorous smoking is likely to drive everything out, queen included; be ready to spot and cage the queen and enjoy the spectacle of the bees following your 'instructions'. Even better if you have an audience who know nothing about bees and are amazed by your wizardry. Capitalise on this showmanship by distributing details of branch membership, a proportion of the public are always considering taking up beekeeping!

If the swarm has occupied a cavity for a few days it can only be recovered by gaining access. I was once fortunate to find the swarm had occupied the flue of an old heated greenhouse; the owners were happy for a few bricks to be removed and the bees were scooped out in handfuls. Eventually one lot contained the queen and the bees soon settled

in a nuc box erected in front of the original hole in the wall; the soot-stained honeycomb identified this colony for many months afterwards! Sadly, the cost of re-building a house wall far outweighs the value of a swarm and sometimes the only option is to kill the bees or seal them up to die out. Beware of the house owner who is so keen to be rid of the nuisance of a swarm that they ignore the caution about who is liable for making-good; one local beekeeper spent two days removing an established swarm from behind wood panelling and was rewarded with aggressive demands that he foot the bill for re-building and re-decorating!

As explained above, occasionally a swarm builds comb where it has settled on a branch in the open. Sometimes the comb is built round twigs and leaves and it is almost impossible to cut it out without destroying it. If you are lucky, the comb may be reasonably straight and easily detached from the branch. Each comb can be mounted in a bare frame (i.e. one without foundation fitted) and held in place by twine or rubber bands. If the swarm/ colony is strong and there is brood, then there is a reasonable chance that the bees can be hived successfully. Once in the hive, unless there is a strong nectar flow, the bees can be fed to assist with fixing their comb and consolidating their nest and stores for the winter

Avoiding the inevitable – out apiaries and bait hives

A very embarrassing situation may arise if a beekeeper allows their bees to swarm and everything from huge prime swarms to tiny casts moves into their neighbours' chimneys, wall cavities and the rest. The classic situation is a modern housing development where the beekeeper's apiary is obvious to all. Once friendly neighbours can turn quite unpleasant! The solution is not to allow this situation to arise in the first place; either manage colonies so that swarming is controlled as far as possible (if you have read this far, then you have no excuse!) or pre-empt the problem entirely by keeping your bees in an out apiary. We do not keep any of our colonies in our garden and we find it very straightforward to locate landowners keen to have hives on their land. However, we keep beekeeping equipment in our garden and this attracts scout bees and then foragers (honeybees will scavenge propolis from used hives, to say nothing of trying to recover the honey crop you have just taken off if you let them get to it!)

Bait hives, ideally set up early in the season, will often attract a swarm. A few frames of used brood comb in a hive is all that is needed. The comb should be treated with acetic acid to kill *Nosema* and EFB spores, but be very cautious about using comb with honey stores. The position of the hive can be critical. A warm, sheltered position with some late afternoon shade seems to be favoured. Bait hives placed some distance from an apiary may be more effective than empty hives among the colonies. Many swarms seem to move down-hill, so bait hives perhaps 50-100 metres below the apiary might create a natural opportunity for the bees to disperse by swarming. Be scrupulous about clearing away dead-outs (hives in which colonies have died); even experienced beekeepers can overlook AFB scale. As soon as a colonies is found to be dead, close up the hive to avoid robbing and deal with the old comb as soon as possible.

Dealing with difficult and dangerous situations

Beekeepers have died and been seriously injured falling off ladders when trying to reach swarms. Branch policy is not to take risks. Be warned that BBKA insurance does not cover this sort of thing. Equally problematic may be members of the public who are desperate to persuade a kindly beekeeper to solve their insect problems at no cost. A small proportion of calls to the swarm co-ordinator appear manipulative. The householder states that they have a swarm when close questioning confirms they have a wasp nest, or claims that a colony established in their wall/ chimney/ air brick etc. for a year or more has only just arrived and so should be collected – by you!

The Branch swarm co-ordination system – how it works

It is important to bear in mind that swarms can be a nuisance to the public and that we perform this service as part of our charitable remit. Equally, a swarm can be valuable to the beekeeper, so the purpose is to link the caller with a local beekeeper able and willing to collect the swarm.

When the swarm co-ordinator is contacted by a member of the public about a swarm, s/he will take contact details and assess the situation. If you are on the list as the beekeeper in the best position to help he will check with you by phone to confirm that you are available. If you are you will be given the name, address (especially the post code) and the phone number of the caller. It is then up to you to:

- Contact the caller.
- Recover the swarm.
- Let the swarm coordinator know the outcome so he can compile the end-of-season report.

To avoid delay and confusion, only one contact will be arranged. It is therefore important that you act as soon as possible. To save a lot of time and phone charges please let the swarm co-ordinator know beforehand of when you will not be available or if you will be away.

Because you are a known beekeeper you may well receive calls directly from a member of the public. Moreover the BBKA may refer calls from the public to you if you are on their list. (If you want to be put on their list, please contact Mike Forster to arrange it.) Normally the swarm co-ordinator will have 'filtered' calls, but when you take a call yourself, question the caller closely about the nature of the problem before you set off to make sure you can deal with the situation. Be careful not to put yourself at risk of injury, criticism or litigation! Remember that pest control officers can remove bees from inaccessible places; that you should always make sure that the landowner knows that you are on their land, and that you should gain their agreement to cut any vegetation etc. if this is necessary to remove the swarm.

If you rescue a swarm that did not come through the swarm coordinator please let the swarm coordinator know the postcode of where you collected it and the result so that it can be included in the annual report.

Beekeepers do not usually charge for taking swarms, but it could be reasonable to ask for expenses. If you decide this is appropriate, then you must make this clear at the outset and the arrangement is between you and the caller. Please let the co-ordinator know if you intend to make a charge. Sometimes people will want to give you money as a way of showing their gratitude; you might then like to suggest a donation to the branch or a charity of your choice. Bear in mind that, if you make a charge, you may be inadvertently converting your hobby into a business; issues of liability, insurance, and tax returns should be borne in mind!

Sometimes the caller is unsure whether they have a swarm or a wasp problem, and sometimes they might pretend they have a swarm in the hope of having wasps dealt with for free. Be ready to deter them by asking for payment or a donation! About a quarter of the calls coming in are about bumble bees. Although we encourage people to enjoy and live with these bees, there are occasions when there is a real need to move a nest. An understanding beekeeper in protective clothing is the best person to perform this task.

The aim of this scheme is not just to help beekeepers make up losses or boost their stocks. As a service to our community please be prepared to deal with late swarms and casts. Please keep a record of all calls you have responded to, and report back to the swarm co-ordinator as you go along – it saves work in the end.

If you wish to collect swarms, please complete a questionnaire before the start of each season and return it to the swarm co-ordinator. (Form attached.)

The Branch co-ordination network

Mike Forster at the moment is the Branch Swarm Collection Coordinator. There are also area coordinators. Contact details of the area coordinators are published on the branch website and shared with District Councils etc. The list of members who have joined the scheme is distributed among all the area coordinators. The areas and co-ordinators are:

Cheltenham – GL50, 51, 52, 53 or Borough Council (Mike Forster unless a willing volunteer comes forward)

Gloucester – GL1, 2, 3, 4, or Borough Council including Churchdown and Brockworth (Mike Forster)

Tewkesbury – GL20, 19, Rural 50 and 52 (note extent of Tewkesbury District Council) (Nick Lambert)

Winchcombe – GL54, WR11 & 12 (Will & Eve Messenger)

Calls also come in from outlying areas such as GL5, 6, 12 (Painswick, Stroud, Wotton-under-Edge); GL7, 8 (Cirencester & Tetbury); GL11, 14 (Dursley, Uley, Cinderford & Westbury) Branch policy is to refer calls to neighbouring branches but time pressure does not always make this efficient, and other branches are not all well organised for dealing with swarms. Each situation has to be judged separately.

Insects that are not honeybees

Wasps and hornets

Until the Asian hornet *Vespa velutina* arrives from France, beekeepers usually have little to fear from our native hornet (*Vespa crabro*). Hornet colonies are small and do not usually have the ability to wipe out whole honey bee colonies that the wasps possess. However, a single hornet can catch on the wing a honeybee returning to the hive with a full nectar/pollen load, consume it, and return for another in two minutes. There again, guard bees are able to catch and 'ball' the hornet, thereby killing it by over-heating it. All hornets and wasps are beneficial early in the season since they are carnivorous and consume many garden pests. Wasps have huge reproductive capacity and so will always be a local nuisance to people. A beekeeper equipped with a good bee suit and thick 'welder's' gloves can simply deal with wasp nests by clearing them at night. The nest may be exposed or located during the day and in the evening is then removed and dropped into hot soapy water – job done!

Bumblebees and other bees other than honeybees

Some beekeepers have an interest in hymenoptera and pollinators other than the honeybee. Notions that 'wild' bees are unimportant and do not deserve research funding are misplaced. Hoverflies are reliable and abundant pollinators but have not been seen as commercially important; little research has been done on them, and so little is known. There is therefore huge scope for amateur entomologists to make simple studies and contribute to our knowledge. Bumblebees have fared somewhat better, partly because they are used for commercial pollination in glass-houses. Nonetheless, beekeepers interested in them can contribute to their survival and our knowledge about them in many ways.

Frederick W L Sladen, at the age of 16 in 1892, privately published 'The Humble Bee'. After 20 years he published 'The Humble-Bee, its life history and how to domesticate it'. Both have been re-printed and are excellent sources. Identification of species of bumblebee is relatively easy 'Bumblebees' [Prys-Jones & Corbet, 1987] is the current 'bible'.

About one quarter of calls to the Association from the public are about bumblebees. Beekeepers are often asked for advice or get involved.

It is very straightforward for beekeepers to assist bumblebee conservation by rescuing disturbed bumblebee colonies. Here are a few tips. Firstly, bumblebees sting! Bumble bee activity around a nest normally presents no danger to humans, although a dying bee can cause misery to a child with bare feet if it is trodden on. Colonies collapsing due to disease, (they have their own predators and pathogens – e.g. *Nosema bombi* and *Aphonia sociella*, a wax moth), can be aggressive and cause alarm to members of the public. A bee suit and thick 'welder's' or gardening gloves solve the problem.

There are two classic situations in which gardeners disturb bumblebees. Soil-dwelling species (e.g. *Bombus terrestris*) are disturbed when shrubs and perennials are dug up or a garden shed is demolished. The gardener encounters very angry bees that seem to want to bury themselves in the loose soil. In fact they are trying to locate the tunnel to their nest which may be two metres from the entrance (to deter predators such as badgers). Thus hours may be wasted (or enjoyed!) digging to locate the nest. The second situation arises when long grass is cut. Here it is the surface-dwelling carder bees (e.g. *Bombus pascuorum*) that are encountered. In both cases, if the gardener abandons their work, the bees can often repair their nest and survive.

If the nest is to be moved, then it has to be dug out and transferred to some sort of artificial nest box. This does not have to be complicated, perhaps a rough wooden box about the size of a shoe box. If the nest is largely intact and the queen and sufficient workers survive, the colony can re-establish itself within hours. Hours can be wasted/ enjoyed sprinkling lawn mowings over the nest and watching the bees fashion a covering to assist with maintaining brood temperature.

Bumblebees do not have the same foraging range as honeybees so they can be moved shorter distances to a new, safe, location. Whenever possible, members of the public should be encouraged to leave bumblebee nests in situ. I find it bizarre that people put up nest boxes for birds and then, when these are occupied by bumblebees, there is great consternation and insistence that the bumblebees must be removed. The solution here is to insist that the bumblebees can only be removed with the nest box. If the householder wishes to keep their nest box then they can be encouraged to leave well alone until the colony disperses and dies out during the autumn.

Nature never stands still and there is a new bumble bee steadily colonising much of the UK. This is *Bombus hypnorum*. It is important to beekeepers dealing with calls from the public for two reasons. Firstly, its natural nesting habitat is in trees and it frequently exploits bird boxes. Since people like to put up tit boxes near their house, then this species is likely to be found in close proximity to them. Secondly, this species seems to be more aggressive (actually defensive!) and so there may be an increased risk of stings. I dealt with one well-meaning lady who had erected a tit box on the post of her rickety back garden gate. Every time the grandson opened the gate the colonising bumblebees reacted. The solution was to move the box and nest, but it would have been easier if the box hadn't been put there in the first place!

Serious bumblebeekeepers can join:

BWARS - Bee, Wasp and Ant Recording Society (www.bwars.com) or

Bumblebee Conservation Trust (www.bumblebeeconservationtrust.co.uk)

Solitary bees

In the UK, if a bee is not a bumble bee or a honeybee (or a wasp!) then it is a solitary bee. Many people are familiar with the Red Mason Bee (*Osmia rufa*) which has been used for pollination and which can be 'domesticated' in specially made cardboard tubes. However there are a few other solitary bees that members of the public may think are honeybees because they

may nest on or near houses. These are the mining bees. These bees build nests underground or in loose mortar, and even though there is no sociality the individuals nest close together; on a warm day the activity may create the impression of a swarm. One species in particular (*Anthophora pilipes*) is common in Cotswold stone walls. None of the solitary bees sting and householders should be reassured that the bees are not destroying their homes and can be left alone. Where they have colonised a wall it is preferable to renew the pointing in stages to avoid destroying all the nests.

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