

Feeding Bees



Llywodraeth Cynulliad Cymru
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The Food and Environment
Research Agency



Introduction

The natural food of the honeybee colony comes from the nectar and pollen that the workers collect and bring back to the hive, either for immediate use or for storing in the cells of the combs. In this country there is normally sufficient pollen for the needs of the colony. Bees cannot live on pollen alone and there are times when the beekeeper must provide a substitute for nectar to prevent immediate starvation or to ensure sufficient stores normally for the winter and early spring but also at other times of the year and even in the summer.

This operation is known as 'feeding', which means giving the worker bees access to a supply of suitable food placed in a suitable container. A suitable food for this purpose is sugar syrup or inverted sugar, and the container in which it is placed is known as a feeder. Food accepted by bees is either eaten or stored, if it is stored, it may be eaten subsequently or transferred to other cells. If the brood combs of an expanding stock contain large amounts of stored syrup and nectar is coming in, then the beekeeper faces a particularly big risk that syrup will be moved up into honey storing supers.

Feeders

Most feeders are designed either to be placed over a feedhole in the inner cover of the hive (the crown board) or to replace the inner cover while feeding is in progress.

'Slow' feeders allow only a few bees at a time to have access to the syrup; 'rapid' feeders give ready access to larger numbers of bees.

Rapid feeders

There are several types of rapid feeder available on the market. For placing over the feedhole, there is the round metal or plastic container and lid, with a tube passing through the centre from below to give the bees access to the syrup. The tube is surrounded by a guard to prevent the bees from drowning in the syrup. It also prevents bees

escaping when the lid of the feeder is removed. Various sizes are obtainable, holding from about 1-7 litres.

For fitting temporarily in place of the inner cover, there are the large rectangular or square feeders constructed of wood, proofed with wax or bitumen paint. You should ensure that you have the right size of feeder for your specific hive. Most models have a device to prevent the bees drowning, which in some types is adjustable to allow the beekeeper to control the size of the passage through which the bees have access to the syrup.

Contact feeders

A very simple and satisfactory feeder can be made from a 7 or 14lb honey lever lid tin or food grade plastic bucket. The lid should be placed with its inner side upwards on a block of wood smaller than the diameter of the lid and deeper than its flange (to avoid buckling and ensure that the lid retains its good fit on the container), and a group of 20-25 fine holes should be punched in it, the holes kept within a circle of about 60 mm diameter. A small nail (of the type used for pinning the joints of frames) makes a hole of the right size.

This type of feeder is also available commercially being a plastic honey bucket with a small area of gauze mesh in the centre of the lid. The container is filled with syrup and the lid pressed firmly in place. The feeder, inverted over the feedhole, is then ready for use. A small quantity of syrup will run out of the holes until a partial vacuum is formed above the level of the contents. To avoid wasting this by spilling it over the hive, it is best to hold the feeder over a pail for a few moments before setting it down carefully over the feedhole. The container should always be filled right up to the level of the lid to reduce this initial drip of syrup to a minimum. The hive should, of course, stand firmly on a level base.

All these types of feeder must be enclosed in additional empty brood boxes or supers.

Frame feeders

Frame feeders are ideal for small colonies housed in a nucleus but also are often used in full strength colonies. They are made to hang inside the brood box and replace one of the frames.

Making syrup

Only refined white granulated sugar should be used for making syrup. For autumn feeding, thick syrup is advisable, made by adding 8 kg of sugar to 5 litres of hot water and stirring until all the sugar is dissolved. This gives a concentration of 62 per cent sugar by weight. A thick syrup can also be made very simply, without the use of weights or measures, as follows:

Place all the sugar into a vessel of suitable size; shake it down to an even surface and mark the level at which it stands. Pour in hot water, stirring as the sugar dissolves, and fill up until the liquid reaches just above the mark at which the dry sugar stood. Continue the stirring until the sugar is completely dissolved.

It is wasteful to feed syrup containing undissolved sugar, because the bees cannot take crystals that settle at the bottom of a feeder and if an inverted contact feeder is used, the crystals may clog the holes completely. There is, however, no need to waste fuel or risk burning the sugar by boiling the syrup; using either of the above methods a complete solution can be achieved by stirring alone – and less cooling is needed before the syrup is ready for use.

For spring feeding a more dilute syrup may be used, made by adding 4 kg sugar to 5 litres of water. This has the advantage of saving the bees many trips to collect water to reduce the strength of the syrup before feeding it to the brood.



Autumn feeding

When preparations are being made for removing the honey crop after the end of the main nectar-flow, each colony should be examined to see how much honey and pollen is present in the brood combs. In some seasons, the bees stock the brood combs with honey before they fill the supers. In others, nearly all the honey may be stored in the supers, leaving the brood combs practically empty; so it should never be assumed that if the supers are well filled, there is necessarily enough food in the brood chamber to maintain the colony during the winter and spring.

Well before winter sets in a colony needs to have 16-18Kg of stores sealed in the combs. The object of autumn feeding is to supply the amount of sugar syrup necessary to bring the total amount of stores up to at least this minimum.

In estimating the amount of stores present in the hives, a British Standard deep comb, well filled on both sides, can be taken to contain 2 kg; a shallow comb 1.4 kg. The weight of supplementary stores given in the form of sugar syrup should be reckoned as the weight of the sugar in the syrup and not as the total weight of the sugar plus the water. Syrup is fed during the latter part of September. If it is given earlier, an excessive amount of the syrup may be used for rearing brood, with the result that there will be less food stored in the combs and more bees to be maintained. If it is fed later, the weather may become too cold for the bees to carry the syrup down, ripen it and seal it over.

Syrup left unsealed may ferment in the combs and cause dysentery in bees that consume it. Syrup for autumn feeding should always be fed in a rapid feeder. This should be large enough to hold the whole amount needed to supplement the natural stores, so that the bees can take it down quickly and without interruption. Thick syrup fed rapidly in the second half of September, produces the maximum amount of sealed stores per kg of sugar used.

Autumn feeding may sometimes be advisable even when the colony already has an ample supply of honey.

Pollen

Pollen is preserved and sealed over by the bees to keep it in good condition throughout the winter and forms an essential part of the stock of food needed for brood rearing in the early spring. Pollen that remains unsealed in the autumn becomes mouldy and turns into hard pellets, which the bees can remove only by tearing down the cell walls.

They usually rebuild the damaged comb into drone cells, so that unsealed pollen in the autumn is often the cause of a spoilt comb in the following spring. If, when the last brood-nest inspection of the season is made, it is found that the bees have plenty of sealed honey but do not seem to be sealing the pollen a few litres of syrup should be given.

This will enable them to complete the preparation of their food supply for the winter. Usually there is no actual shortage of pollen in the brood-nest but occasionally colonies may be found with combs containing little or no pollen, whereas others in the same apiary may have more than they need. Provided there is no disease in the apiary, combs of pollen may be taken from those colonies able to spare them and given to those that are deficient.

Such combs should always be put on the flanks of the brood-nest and never between combs containing brood. Three or four good combs of pollen should be present in each colony.

Heather Honey

Colonies that have been taken to the heather may come back with brood chambers full of heather honey. As a winter food for bees, heather honey is sometimes unsuitable, causing digestive trouble and dysentery. Some beekeepers remove a couple of the combs of honey, those nearest the centre on each side, and replace them with empty drawn combs.

Syrup is then given in a rapid feeder. The bees will fill the two empty combs with syrup and the stores in these combs will be used first as winter food. The heather honey will be used later when brood-rearing starts, for which purpose it is satisfactory.

Spring feeding

Spring feeding with thin syrup was once regarded as a necessary part of the routine management of bees but it is likely that much of the success attributed to it was due more to the water in the syrup than to the sugar. In the absence of fresh nectar, which in itself contains enough water for the purpose, the bees must find water to dilute sealed stores. A suitable source of water should be provided in the form of a 'drinking fountain', placed 10 metres or so from the hives, in a sheltered position warmed by the spring sunshine.

Nevertheless, it is sometimes desirable to encourage a colony to build up more rapidly than it would if left to its own devices – for example, a colony, which is to be used later on for queen rearing, or one that is to be split up for making increase. Provided it has ample stores of pollen for the needs of an expanding brood-nest, such a colony may be fed by giving small quantities of syrup in a contact feeder at regular intervals, (taping over most of the holes in the feeder lid will slow down the rate of feeding) from mid-March or early April until the bees can forage freely for themselves.

Candy

Routine spring feeding is unnecessary for colonies intended solely for honey production. In the autumn they should be given enough food to see them safely through the winter and spring. A mild, wet winter may necessitate a mid or late winter-feeding of 'candy' or fondant to prevent the bees from starving. It should be borne in mind that feeding candy causes the bees to carry out many more flights to collect water to dilute the candy.

Feeding a swarm

Bees in a swarm take a supply of honey with them when they issue from the parent colony, but if the weather turns bad soon after the swarm is hived, it will be necessary to feed syrup in a rapid feeder so that the bees can maintain themselves until the weather improves.



Swarms should not be fed for the first three or four days. The honey being carried by the swarm may be diseased and should be used to build comb. If the swarm is hived on frames fitted with a wax foundation the bees have to produce a large amount of wax to draw the foundation out into comb. Even in good weather additional food in the form of a gallon of syrup will help the new colony to establish itself.

Feeding a nucleus

A nucleus (a small colony of 2 to 5 combs of bees made up from a strong colony) has very few bees of foraging age and, therefore, needs to be kept supplied with food by the beekeeper. If combs of honey cannot be given it will be necessary to supply syrup in a contact or a frame feeder. To reduce the risk of robbing, newly made nuclei remaining within flight range of the parent stock should not be fed for the first 3 days.

Estimating the consumption of stores

If care has been taken in the autumn to see that each colony is well provisioned with honey and pollen (supplemented if necessary with sugar syrup) the bees will not run short of food during the winter and early spring. It is, however, easy to determine the approximate amount of stores left at any time during this period by using a spring balance capable of weighing up to half the total weight of the hive.

The balance is first hooked under one side of the floor and lifted until the hive is tilted just clear of its base. The operation is repeated by hooking the balance under the floor on the opposite side. The weight of the hive is the sum of the two observed weights, even if the contents of the hive are not uniformly distributed. Reading the dial of the balance is made easier if a chain extension is used to bring the balance up to eye level. The weight of the hive should be recorded after feeding is finished in the autumn. Check weighing taken later on can then be compared with this figure.



When all the hives in an apiary are of the same pattern, the approximate weight of the stores in each hive can be calculated if the weights of the various hive parts (including empty drawn combs) previously recorded for reference plus a constant amount of, say 5-6 kg to allow for the bees, brood and pollen, are subtracted from the total weight (according to the number of brood-chambers, supers, lifts, in use on the hive during the winter).

As experience is gained, the 'feel' of a hive obtained by gently lifting it by hand, first on one side and then on the other, can give a reasonably reliable estimate of the state of affairs within.

Emergency feeding

It is a good rule never to allow the amount of stores to fall below 5 kg. Rules cannot always be kept, however, and if a colony does run short of stores it must be fed to carry it over the emergency. If the weight or 'feel' of a hive in late winter or early spring raises any doubts about the amount of stores left for the bees, the colony should at once be given warm, thick sugar syrup, in a contact feeder so that the bees can take the syrup readily without having to move far from the cluster.

Sugar candy or fondant is a handy form of supplementary food for use in spring, as it is an insurance against starvation if the amount of food left in the combs is thought to be inadequate to meet the increasing rate of consumption at this time of year. It can be obtained ready-made in cakes or blocks for placing over the feedhole. Candy should not, however, be used as a food for over-wintering colonies in place of sugar syrup fed in September.

If the bees are forced to rely upon having continuous access to candy placed over the feedhole in the autumn, and left there throughout the winter, they will be working at it actively during this period instead of clustering quietly on the combs below. Furthermore, the candy will absorb moisture from the atmosphere of the hive and its water content will increase. The end result may then be an acute dysenteric condition among the bees, with possibly fatal consequences for the whole colony, due to an excessive accumulation of waste products in the bees' digestive system.



Honey should not be fed back to bees: It causes great excitement in the colony and is liable to induce outbreaks of robbing. Invert sugar candies made by inversion with the enzyme invertase are suitable for bees. Feeding in this way should be regarded strictly as an emergency measure and should be followed at once by a feed of thick sugar syrup given in a rapid feeder. In a bad season colonies may run so short of stores, even during the summer, that feeding with syrup in a rapid feeder is necessary to prevent starvation.

Colonies, strong in brood and bees, can very quickly eat up their reserves if there is a scarcity of nectar for any length of time. As an emergency measure, if the bees are found to be in a drowsy condition – a result of the complete exhaustion of their stores – they can sometimes be revived if warm syrup is sprinkled down between the combs or lightly sprayed over the bees using a hand sprayer; syrup in a rapid feeder should be given as soon as the bees have recovered sufficiently to take it.

Precautions

Giving syrup in a feeder always causes excitement in a colony, at least temporarily; if this occurs during the daytime, bees flying around in search of food can soon start an outbreak of robbing, particularly in the autumn when there are strong forces of bees of foraging age and little or no nectar for them to collect.

All the hive entrances should be reduced to a width of 25-50 mm, depending upon the strength of the colonies before any feeding is started and the hives should be examined carefully to make certain that there are no gaps between the various parts through which robber bees, or wasps, could find their way. The syrup should not be given until the evening, when there will be fewer flying bees to cause a disturbance in the apiary.

Similarly, feeders that need to be refilled, should be replenished in the evening rather than during the day-time.



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