Feeding Bees

Feeding Bees Sugar

This note provides guidance on feeding sugar to honey bees. In nature this is not necessary but with managed honey bees where there is a dearth of nectar or where honey is removed as a crop it is often necessary to replace the honey or supplement what remains to ensure the bees' survival. When feeding bees:

- Make up and use feeds of good quality pure sugar. White granulated sugar is the most suitable source.
- For convenience, especially for larger scale beekeepers, obtain a prepared bee feed from a suitable commercial source.
- Avoid feeding honey as it carries the risk of spreading bee diseases and the odour increases the likelihood of robbing.
- Use the right method, time and type of feeder for the task.
- Avoid spilling or leaving syrup open to bees in the apiary.
- Take care to avoid robbing.
- Pollen and water may also need to be supplied.

Bee candy

- Candy or Bakers' fondant was first used to feed bees in the 18th century because it was the purest form of sugar then available.
- Today candy is used by many beekeepers to top up honey bee colonies in winter and for use in package bees, queen mating mini-nuclei and queen introduction cages.
- It is best purchased from a bee supply merchant. If you wish to make your own candy, recipes can be found in relevant text books, but consistency tends to be variable when home made.

Making sugar syrup

- To make sugar syrup use white granulated sugar. With modern production methods it makes no difference if this was sourced from cane or beet.
- Do not use brown or raw sugars as they contain impurities.
- The syrup should be made up in the proportion of 1 kg of white granulated sugar to 630 ml of water or 2 lb sugar to 1 pt of water. There is no need to boil the mixture but using hot or warm water helps. Stir regularly to remove air bubbles and dissolve all crystals. When fully dissolved the mixture is clear and a very pale straw colour.
- If syrup is stored for any length of time then a scummy black fungal growth may appear. This can be prevented by adding a little thymol. Thymol does not dissolve readily in water but a solution can be made up in a small, sealable bottle. Fill it to one third with thymol crystals and top the bottle up with surgical spirit. Add 2.5 ml of this solution to 4.5 litres of sugar syrup or half a teaspoon to a gallon of syrup.
- For some feeding, usually in the spring, when it is for immediate use by the colony, thin syrup is used. This contains twice the quantity of water and is best made up for use as required.
- Sugar syrup can be stored and moved around in suitable clean plastic drums. In the apiary a plastic watering can is a useful device for filling feeders.

Feeders

There are three basic types of feeder used to feed sugar syrup to honey bee colonies:

Pan feeders

Often inappropriately named rapid feeders in the UK, pan feeders comprise a tray which is placed over the hive to which bees have access from below by means of a hole or slot arranged to stop them drowning. Versions such as Miller or Ashforth are made to the same external dimensions of the hive and are placed on top of the hive in lieu of the crown board. They can feed up to about 10 litres (or just over two gallons) at a time. Smaller plastic versions are available for placing over the crown board feedhole. Pan feeders are ideal for feeding bees in the autumn but are of less use in very cold conditions. When filling rapid feeders a small quantity of syrup is trickled down the side of the hole or slot to create a trail for bees to follow.

Contact feeders

These are plastic buckets of various sizes fitted with a lid having a gauze centre section. In use they are either filled with sugar syrup, or the syrup is mixed in the bucket. The lid is placed on the feeder to seal it up. In the apiary the feeder is inverted over an empty container to catch the small amount of syrup that will pass through the gauze before internal air pressure in the bucket, which holds the syrup in the feeder, drops. It is then placed on the hive with the gauze patch over the crown board feeder hole. An empty brood box, super or eke will be needed to support the hive roof properly. Contact feeders are generally more accessible to bees in cool weather conditions as the feeder is closer to the nest, making them more effective for emergency and spring feeding.

Frame feeders

These are containers that look like a brood frame with a slot at the top, and have a float inside to prevent bees drowning. They are filled by pouring prepared syrup through the slot. Typically they are used to supplement the food and replace a frame within the brood box. In the UK they are mostly used for keeping nuclei 'topped up' and in queen rearing systems.

There are some other types of feeder but these are not in common use.

Feeding sugar can be divided into three types:

Autumn feeding

- As a rule bees only need feeding because a crop of honey has been removed by the beekeeper. When taking a crop ensure that the bees have sufficient stores left in the hive to prevent starvation.
- September is generally the time of year chosen to feed sugar syrup as a supplement or substitute to ensure that honey bees have sufficient stores to carry them through the winter. Feeding is done after the honey crop has been removed, while the colony is still strong and while it is warm enough for bees to move up into the feeder to take syrup down, invert it and store it properly in the comb.
- Earlier feeding tends to be converted into brood so unless there is a risk of starvation wait until September.
- The amount of stores required by a colony to carry it through the winter varies with the strain of bee. The old British black, *Apis mellifera mellifera*, only required about 10 kg of honey to safely feed it through the winter, but today an average honey bee colony requires about 18–22 kg or 40–50 lb to do so. Larger hives headed by prolific queens may require more. A British Standard brood frame when full of honey contains about 2.2 kg or 5 lb so assess the existing colony stores and feed the required balance using sugar syrup.
- Feeding at the time of some varroacide applications, usually

those containing essential oils, is discouraged as this may increase robbing risks. Check the varroacide directions.

Emergency feeding

- These procedures are best practiced by avoiding starvation.
- Bees can starve at any time of the year and usually if this happens it is the beekeeper and not the bees who should take the blame. It is the responsibility of the beekeeper to make sure that bees have enough stores.
- Sometimes in winter, bees use up stores on one side of the hive and become marooned away from stores elsewhere. This is known as isolation starvation. Frames of stores can be moved across so they are adjacent to the bee cluster. Do not divide the brood nest.
- If bees are short of stores in the winter and likely to starve then white soft candy (Bakers' fondant) is placed over the crown board feed hole. In the case of small colonies the crown board may need turning in order to position a feed hole over the bee cluster. Bees require water, often taken as condensation within the hive, to make use of candy. Candy is therefore taken slowly and does not excite the colony as much as other feeds. If sugar syrup is offered in a contact feeder, cold temperatures may cause contraction of the container pushing syrup through the mesh and wetting the cluster. Correct autumn feeding prevents this scenario.
- If bees are short of stores at the spring inspection then feed thin sugar syrup using a contact feeder.
- In extreme cases when bees are starving spray them with a thin sugar syrup solution and fill an empty comb with sugar syrup. This can be done by pouring syrup into the cells slowly using a honey jar filled with sugar syrup and closed with a lid having 3 mm holes on opposite sides, or using a squeezy bottle, e.g. a clean washing-up fluid bottle. When filled, place the comb adjacent to the bees.
- Remember March and April are the months when the bees will be using up food reserves fast as the colony expands and produces more brood. It is far better to have fed sufficient stores or left lots of honey in the autumn than to do emergency feeding in the spring. In March and April a colony should have at least 4–5 combs with honey/stores, i.e. 9 kg or 20 lb.
- When removing a honey crop always check that sufficient stores remain to prevent bees starving. Feed immediately if needed.

Spring or stimulative feeding

- Many beekeepers feed a thin syrup solution to encourage brood rearing, but providing the colony has sufficient stores, as stated previously, this is pointless.
- It is a good plan to breed bees for the honey flows rather than breeding bees on the honey flow.
- To rear brood, bees need to be fed on a mix of honey or sugar, water and pollen. Therefore, to encourage brood rearing:
  - Ensure that the colonies are close to pollen crops or fed pollen.
  - Ensure that the colonies have sufficient honey and/or sugar syrup stores. If not feed a thin syrup.
  - Ensure that the bees have access to a clean water supply. If necessary use a water feeder.

Robbing

- Feeding syrup excites bees and is usually done when there is no, or little, nectar flow. As a result care should be taken to prevent robbing.
- Especially when feeding in autumn, supply the feed to all colonies in the late evening as night will help quell bee activity. Reduce the hive entrance with an entrance block.
- Watch for signs of robbing: bees fighting, erratic flight and bees trying to enter a hive without meeting the guards. Strong colonies invariably rob weaker ones.
- If robbing starts reduce the entrance to one bee space in all directions using an entrance block and/or grass. This enables guard bees to protect the colony more efficiently. Placing a sheet of glass in front of the hive entrance so that bees have to go around the sides for access to the entrance can also help.
- The best cure to a robbing event is to move the besieged colony to another apiary.
- If a robbing event commences during inspections close up the colonies, reduce entrances and leave the apiary.

National Bee Unit, Best Practice Guideline

Feeding Bees Water

Water is essential for honey bee colonies to process stores, make brood food, maintain humidity to ensure that eggs hatch etc. and for cooling the colony in hot weather. It is not stored in the hive, although 'reservoir bees' will be carrying it in their honey sacs.

- It is notable that feral honey bee colonies tend to follow water courses when they swarm indicating the importance of water to them.
- Apiary sites need to be assessed for the availability of suitable water. Many public complaints are made because of bees obtaining water from swimming pools, garden ponds, drying washing etc., especially during dry periods.
- If bees do not have adequate natural supplies then provide a supply by using a water feeder. Entrance type feeders available from equipment suppliers can be adapted, but a communal site away from the immediate apiary may be more suitable. It will be necessary to make your own, and instructions can be found in some beekeeping text books and on the internet.
- If making your own water feeder, remember that it is the natural inclination of bees to suck up moisture from a wet surface such as soil, sand or brick rather than from an open water surface. An area of about 75 cm^2 or 12 in^2 per colony is required at times of dearth. Do not permit the moisture to become stagnant. The landing area needs to be greater than the watering area.
- Bees have a preference for water that is warmer than 18°C and also for urine to which, like other insects, they are attracted by the salts it contains.
- When first supplying water add a little salt to encourage the bees to use it.
- If bees are using an open water source, such as a water butt, put floats on the surface for the bees to use so as to prevent bees drowning.
- If bees are contained in hives for long distance transport or during crop spraying in hot conditions they may require a supply of water to prevent overheating. A contact feeder filled with water and placed over a feed hole can provide this.

National Bee Unit, Best Practice Guideline

Erratum: *In the Disease Recognition NBU Guideline (June BBKA News) the captions for light microscope views of Nosema ceranae and N. apis were swapped inadvertently. The editors apologise for this error.*