

To Feed or Not to Feed?

By Maggie Gill, Seasonal Bee Inspector, Wales

Although honey bees are usually able to stock their larders with adequate supplies, there are some occasions when they need a little help from us to ensure they remain well-fed. Maggie Gill explains when and how to identify and satisfy their needs.

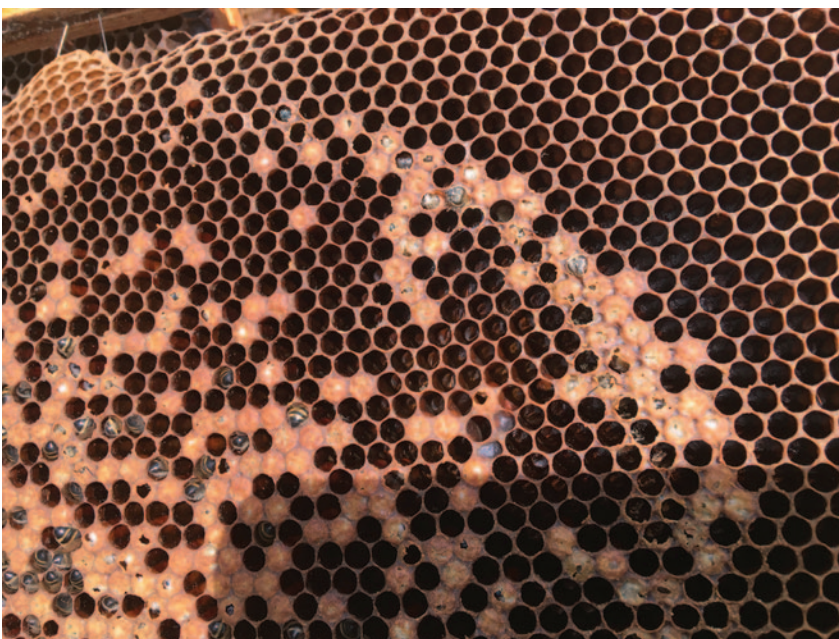
There is nothing more frustrating than to lose a colony to starvation, but fortunately it is one of the easier beekeeping problems to solve. As you go about your routine inspections it is always sensible to ask yourself: 'Does this colony have enough stores to last until my next inspection?' The answer will depend on the weather forecast and the forage available. A lack of food will stress a colony, making it more prone to succumb to pests and diseases and will also hold back its development and productivity. If you do need to feed, the time of year will have the biggest impact on how and what you feed.

Summer feeding

Generally, feeding in the summer only takes place when foundation needs to be drawn into comb. Swarms are ideal for drawing comb as they are primed to do so, although it is best practice to wait 24 hours before feeding a swarm to help prevent the spread of disease. You want the bees to start building comb using the food stores that they have brought with them first. A

good feed of 'heavy' syrup will greatly help any colony that is drawing foundation, and it is preferable to feed, even if there is a good nectar flow at that time, until the majority of the foundation has been drawn into comb.

Pure white granulated sugar should always be used when making syrup at home as impurities in brown, golden or icing sugars can cause digestive problems in bees. To make a 'heavy' syrup mix 1kg of sugar with 630ml of water, or 2lbs of sugar to 1 pint of water. Using hot water will help to dissolve the sugar, but do not boil the syrup as this can cause HMF (hydroxymethylfurfural) to form, which is toxic to bees. Ready-made invert syrup can also be purchased from beekeeping suppliers and most local associations. These ready-made syrups are easier for bees to digest and process as the inversion of the sugars, which is part of the digestion process, has already been done. Invert syrup is a slightly more expensive way to feed your bees and there is nothing wrong with home-made syrup, but it is undoubtedly more convenient.



Starving bees. A brood frame with no stores. Bees can be seen head down in the cells looking for food and this is a classic sign of starvation. All photo by Maggie Gill.

The 'June gap' is also a time when some colonies need feeding in the summer. A dearth of available natural forage can happen from May through to the end of July, but it does not necessarily happen every year and in every location. An important thing to remember is that even though there may be flowers in your area, you cannot always assume that your bees can forage nectar from them. Honey bees can forage on most flowers, but not all, and even flowers that can usually be relied upon as a forage source can fail to produce nectar in particularly dry weather. Therefore, you should never assume that just because you have seen flowers in bloom, your bees do not need feeding. When removing any spring honey crop bear in mind that there may be a June gap or even just bad weather, and the colony will need enough stores to survive until your next inspection. A good rule of thumb is that a colony will use 5kg of honey a week if there is no forage available.



A rapid feeder. Bees access the syrup through a central slot and this type of feeder can be easily topped up with minimal disturbance to the bees.

A full brood frame holds approximately 2kg and a super frame holds 1kg, so it is easy to assess a colony's stores during an inspection. It is best to avoid feeding colonies from which you expect to take a honey crop unless absolutely necessary, as feeding during the season can lead to honey crops becoming contaminated with syrup.

Autumn feeding

After honey crops have been removed at the end of the summer and *Varroa* treatments have been completed, autumn is the time when most beekeepers will feed their colonies. A 'normal' colony will need between 15kg and 20kg of stores to survive the winter, which equates to approximately half a brood box and a super full of stores. However, particularly large colonies will need more than this.

To reach this level of stores, heavy syrup should be fed while the colony is still strong enough, and the weather is still warm enough for the bees to move up to the feeder, process the syrup and store it as 'honey' in the comb. To meet these conditions, autumn feeding usually takes place in September. Feeding earlier than this can encourage the bees to use the syrup to increase brood production rather than store the food for winter.

Bees should never be fed in the open as this encourages robbing and can spread disease, but there are a variety of feeders that can be used in the hive to feed individual colonies as they require. The risk of robbing can be reduced by feeding colonies in the evening and always be sure to clear up any spilt syrup. The choice of feeder you use will depend on the amount of feed a colony needs. Miller and Ashforth feeders, also known as rapid feeders, are trays that hold syrup, which sit under the crown board and can be accessed by the bees through a slot from underneath. These types of feeder are good for feeding large volumes of syrup quickly and the bees are only minimally disturbed when the feeder needs topping up, as only the roof and crown board need to be removed for access. They can, however, be expensive and if the bees gain access to the main tray of syrup they inevitably drown. Contact feeders usually take the form of a plastic bucket with a close-fitting lid that either has a section of fine mesh or holes drilled in the lid (see photo above). The bucket is filled with syrup and the lid replaced tightly. This is then inverted quickly over a container where an airlock forms in the bucket preventing the syrup from escaping, although it is normal for a small amount of syrup to come out as it is being turned before being placed on the crown board. The bees can then access the syrup through the mesh or holes in the bucket lid, which should be lined up with a hole in the crown board. These feeders are usually cheap to buy or can be made by beekeepers; any



A contact feeder filled with syrup and inverted over the hole in a crown board. This is a container (here, a bucket) with a tight-fitting lid either containing a section of fine mesh or pierced with small holes through which the bees access the syrup.

container with a tight-fitting lid can be used. Feeding can be slower when using a contact feeder and changes in temperature and air pressure can cause syrup to leak from the container onto the bees. A super or brood box is also needed to house the contact feeder.

Frame feeders are frame-shaped tanks with floats, which can be filled with syrup and placed in the brood box. Due to their small size they can only hold a small amount of syrup, so they may need to be filled more regularly and with a greater disturbance to the colony. Bees do also tend to drown in these feeders, so it is advisable to replace the supplied float with dried bracken or straw. These feeders are useful for feeding small colonies and nuclei.

When you have completed feeding and do not anticipate inspecting your colonies until the following spring, it is always a good idea to remove queen excluders during your last inspection of the year, as this will allow the queen to move with the winter cluster of bees if they move up into a super to access stores.

Winter feeding

Generally, no feeding should be needed over the winter if sufficient autumn feeding has taken place. It is a good idea though to heft your colonies regularly throughout the winter to assess the amount of stores still left in the hive. Hefting involves lifting one side of the colony a few inches off its stand to get an idea how heavy it is, and if this is also done throughout the autumn you should begin to learn the difference between a colony with plenty of stores and a colony with none. I always heft two sides of my colonies as the bees can eat all the stores from one side, and if you only heft the side which is still full of stores you can be misled into thinking the colony is fine. Taking the roofs off and comparing the weights of more than one hive makes this process more accurate and easier to assess.

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Isolation starvation

Isolation starvation is probably the most frustrating way to lose a colony, and this happens when a colony has plenty of stores but has become isolated from them and ends up starving (see photo on page 269). As the weather gets colder the colony will form a cluster and eat the stores available where the cluster forms. If this is at one side of the hive the cluster is then sometimes unable to move to the other side to access the remaining stores. Bees in some top bar and long hives are particularly prone to isolation starvation as they prefer to move up (heat rises) and are generally reluctant to move sideways to find stores. If the bees have become isolated from their stores, frames of honey can be moved from within the hive so that they are next to the cluster of bees. Scoring the honey cappings with a hive tool will encourage the bees to use the stores, but opening any hive during the winter should be avoided unless absolutely necessary.

Fondant can be used to feed colonies in the winter and can be purchased from beekeeping suppliers or made at home. Bakers' fondant can also be used, but the ingredients should be carefully checked as additives, such as anti-caking agent, can cause dysentery. Ideally, fondant should be placed directly over the cluster of bees, and this can be on the top bars of the frames or over a hole in the crown board. In emergency situations a 'light' syrup can be sprayed onto starving bees and poured into an empty comb and placed next to the bees at any time of year.

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Spring feeding

As the days lengthen and the weather starts to warm up, colonies will begin to produce brood and will use up their reserves of stores quickly. If needed, light syrup can be fed to bees in the spring and is mixed at a 50:50 ratio of sugar to water in the same way as heavy syrup. Feeding in the spring will encourage brood production, but you should be aware that this can lead to early swarming of colonies.

Honey bees tend to collect pollen as required and only store small amounts compared to honey, so it is normal to see only a narrow arch of pollen between the

brood and stored honey. Pollen is needed to make brood food and consequently a lack of pollen can result in a reduction in brood production. There are a wide variety of ready-made 'pollen patties' available from beekeeping suppliers. These are fondant blocks that have been enriched with a protein source which can be pollen, soy flour, brewer's yeast or milk or egg powder and they often have other additives as well. As these pollen patties are similar to fondant, they are fed in the same way, by placing on the crown board or top bars. Beekeepers can also attach pollen traps to their colonies to collect pollen, which can then be stored and fed back to colonies when needed. Pollen traps need to be emptied daily and the collected pollen needs to be stored carefully to prevent the pollen from becoming damp and going mouldy. Pollen can be fed back to colonies by placing it in a small tray next to the feed holes in the crown board. Both honey and

pollen can contain bee diseases that will infect colonies, therefore it is crucial to be certain of their origins if they are being used as feeds. It is generally best to only use pollen or honey collected from your own hives as feed.

Conclusion

The most important point to remember is that starvation can always be prevented. When inspecting your colonies, it is easy to become side-tracked wondering what your bees are getting up to, but if you observe carefully the amount of stores available and take into account the weather forecast, starvation of a colony is easy to avoid. Crunch time is near when the bees appear slow and listless and fall off the comb! Similarly, in winter, regular hefting should alert you to any problems and the more you do it the more confident you will become in gauging the amount of stores that are left.

