



National Bee Unit

Preparing Honeybee Colonies for Winter

The importance of preparing colonies to enter the winter in a healthy state, with an adequate supply of young healthy bees and stores, cannot be over-emphasised. The beekeeping year starts here, so a colony overwintered in good condition ensures that it is fit for purpose in the following spring. Recent winter colony loss investigations, both in the UK and across Europe, have clearly shown links between colony deaths and the viruses, particularly deformed wing virus, which are associated with *Varroa* infestations. This highlights the importance of effective and timely *Varroa* control. This sheet gives guidance to help beekeepers overwinter colonies successfully.

Timing

Winter preparation is usually done after the removal of the last honey crop of the year, coinciding with any varroacide treatments that may be required. This date will vary with the apiary location, but is normally from early to mid-August. However, with late flows from crops such as Heather and Himalayan balsam it may be later, and if so particular care must be taken with respect to *Varroa* levels and control. For instance, it may be necessary to apply a short term treatment to reduce the population of *Varroa* prior to colonies working late flows.

Check each colony to ensure:

Queen-right

It is better to overwinter colonies with young healthy queens, as they are less likely to die or become drone layers. Also, the brood nest of a young healthy queen is likely to be bigger later in the season than that of an old queen, thus helping to ensure an adequate replacement of the older worker bees. This is particularly important as those older bees may have shorter lives because of the pathogens associated with *Varroa* infestations and other bee problems. Colonies that go into winter with too few young bees are likely to dwindle rapidly in the spring. To remain productive, honey-producing colonies should be headed by queens no more than

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two years old. Queens with desirable traits can be kept to a greater age for breeding purposes, and many beekeepers maintain these in nucleus colonies.

Disease free

Check each colony for signs of brood and adult bee diseases. Remedial action or culling should be undertaken as appropriate. If the disease found or suspected is statutorily notifiable, i.e. European or American foulbrood, you must inform your local Bee Inspector or the National Bee Unit. Beekeepers should know the signs of these diseases and inspect colonies for foulbrood and other bee diseases throughout the season, as a minimum specifically once in the spring and once in the autumn. If colonies are small, find out why. If they are pest and disease free they can be united and re-queened. If diseased, remedial action can be taken, but culling may be a better option. Further information about brood diseases can be found in the NBU leaflet '*Foulbrood Disease of Honey Bees and other common brood disorders*'.



Fig 1. Overwintering queens in mini plus mating nucs.

Pest free

Check each colony for the exotic pests Small hive beetle and *Tropilaelaps*. If you suspect they are present you must inform your local Bee Inspector or the NBU. Further information can be found in the NBU Leaflets '*The Small Hive Beetle*' and '*Tropilaelaps: parasitic mites of honeybees*'.

Varroa numbers are below the treatment or damage threshold of 1,000 mites.

Varroa must be kept below the damage threshold. If beekeepers are not monitoring *Varroa* mite levels it is important that varroacides are used during mid-August rather

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than delaying treatments until September or October. This is because the bee brood population in a colony reduces significantly during July and August, whilst the *Varroa* population is doubling every 3 to 4 weeks. As winter bees are developing in late August and early September, it is important that the virus infections associated with *Varroa* are not triggered or transmitted to them. This population principal is illustrated in the graph below. If your bees forage on late crops you should monitor infestation levels and use bio-technical control methods in early summer, such as comb trapping. With proper *Varroa* management in early summer mite populations will be below the damage threshold during these late flows. Further details can be found in the NBU Leaflet '*Managing Varroa*'.

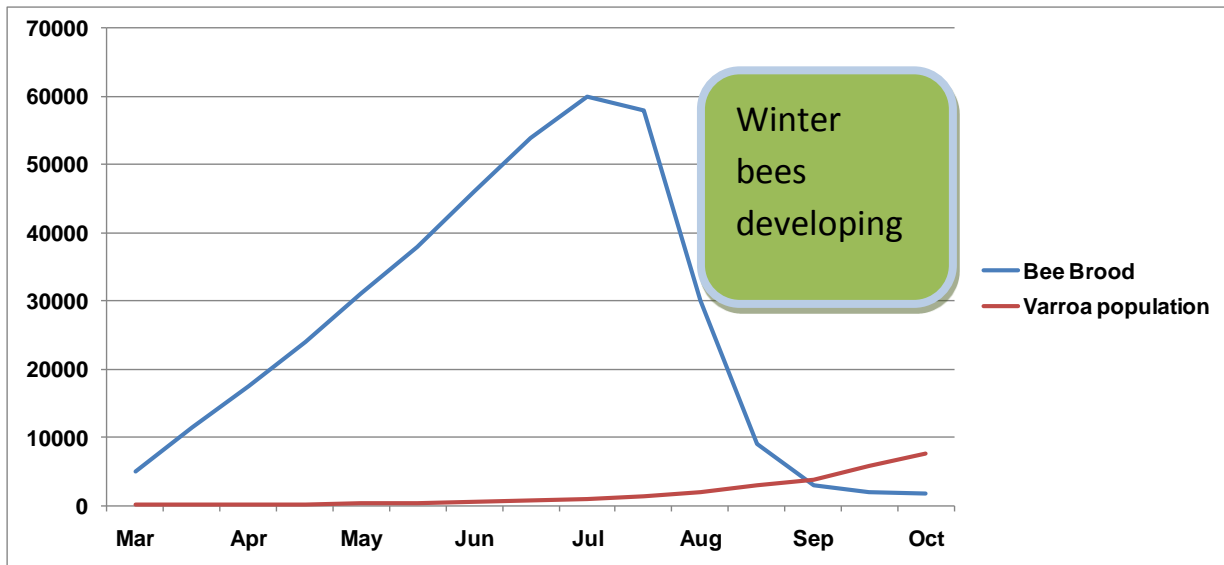


Fig 2. *Varroa* population growth in relation to bee brood.

Sufficient stores

The amount of stores required by a colony varies with the strain of bee. It is generally considered that a honey bee colony requires about 20 – 30 kg of honey to safely feed it through the winter. Larger hives headed by prolific queens may require more. When full a BS brood frame contains about 2.2 kg of honey, so assess the existing colony stores and feed the required balance using winter strength sugar syrup, i.e. 1 kg of white granulated sugar to 630 ml of water. Sugar syrup can be fed to supplement honey stores or as a substitute for them. Watch out for robbing bees, this can be a problem in late summer. Colonies also require ample pollen to overwinter successfully, especially to rear brood. Ensure that your overwintering bees have access to good quality pollen crops both at the end of the season and early in the following season.

Hive in sound condition, waterproof and well ventilated

Apiary sites need choosing carefully to ensure that they have good access in all weather, firm but well drained ground, sunny, not in a frost pocket, good air

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circulation, etc. Damp rather than cold kills bees so check hives, especially roofs, to ensure rain is shed away. It is best to ensure that your hives are off the ground on suitable stands. If your apiary site is not vulnerable to windy conditions, and you are using open mesh floors, they can be left with the floor inserts out. If not, or your hives are on solid floors, then you can lift the crown board on two-millimetre laths. Used matchsticks are excellent for this purpose.



Fig 3. Chicken wire is placed around the hive to serve as woodpecker protection.

Protected from vermin

Fit mouse guards to prevent access by small rodents, which often nest in hives during the winter. In some areas green woodpeckers can damage hives, so if this is a known problem in, or near, your apiary, place a simple cage of chicken wire around and over the hive, at least 300 mm from the hive walls to prevent damage whilst permitting bees to fly.

Monitor throughout winter

Once you have taken every precaution to ensure your colonies survival leading up to winter, it is important to remember to still monitor them during the cold months. This is particularly essential for those hives that were strong throughout the year and went into winter vigorously too. A standard British National colony will need between 20 - 30 kg of food and larger hives will need more. Once they have stored all their food for winter, there are several methods that can be employed to monitor your hives:

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Hefting the hive

At the end of autumn, go around and heft your hives to gauge the weight of the brood boxes. This is the weight you want to try and maintain throughout the winter and if it is getting particularly light, then chances are that you will need to feed them fondant. It is advisable to do this every other week. Around December, giving your bees a block of candy for Christmas won't hurt either.

Opening the hive

When opening the hive, you are only doing so to make a quick assessment of the cluster in relation to the stores of food. Do they have enough food? If so, are they isolated from it? This inspection should only take around 20 seconds – don't hang around.

What do you mean by are my bees isolated from food?

Even when a colony has plenty of food they may become isolated from it and end up starving. This happens when colonies move towards one end of the brood box and consume all the stores. They then isolate themselves at that end of the chamber and are unable to move the cluster to the other end where the remaining stores are. As a result they isolate themselves and starve. To prevent this from happening, every other week open the hive and have a look at the frames next to the cluster. If they are empty replace them with frames from the same hive that have food and score the honey with your hive tool. Place the frame next to the cluster and repeat with subsequent frames. If food is low give them fondant which should be placed on the top bars, directly above the cluster.

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