Healthy Bees for Winter

A colony of bees needs to be strong and healthy to get through the winter. As the temperature drops the bees form a cluster – loose at first but getting tighter as it gets colder. The bees on the outer mantle form an insulating layer while the bees on the inside generate heat, and the cluster needs to be large enough to do this efficiently. Small clusters may well be too small to survive.

The Winter Cluster

A colony with less than 5 full seams of bees in early autumn is unlikely to make it through to spring and should be united with a larger colony (first making sure it is not diseased). Another option would be to transfer the colony to a well-insulated polynuc.

The winter bees need to survive for 6 months and their lifespan can be decreased by both brood and adult disease. Adult bee diseases such as *Nosema* shorten the lifespan of the worker bees and the overwintering colony population may drop to a level too low to survive until spring. Or, the population of remaining adult bees may be protein deficient as a result of *Nosema*, with under developed hypopharyngeal glands and therefore a lack of nurse bees to feed new brood. Spring dwindling occurs and the colony will die.

Good apiary hygiene is key to preventing this and ensuring your bees go into the winter healthy. Any stored brood comb should have been fumigated with acetic acid . When doing your final autumn check if you notice colonies with dirty brood frames take a note and earmark them for a Bailey Comb Change in the spring. The combination of feeding to promote wax production and clean comb gets your colonies off to a turbo charged start. If the colony is weakened by disease the modified Bailey Comb Change will need to be done instead.

Varroa treatments should have started when the supers were removed so that the mite population (which is at its highest at the end of summer) is as low as possible going into winter. Larvae affected by *Varroa* will produce adult bees with a shortened life span and similar effects on colony size as *Nosema* and the potential for spring dwindling. (End of Season Varroa Treatment).

Other brood disease such as chalkbrood and foulbrood reduce the number of adult bees emerging and weakens the strength of the colony. Late summer brood disease checks should already have been completed. Suspected foulbrood must be reported to the Bee inspectors (Bees_mailbox@gov.scot). It's too late now to deal with chalkbrood and sacbrood (and although the latter doesn't usually cause any problems it has been noticeably more prevalent this year). A colony affected by chalkbrood may be weak but it should not be united with a stronger colony. In the unlikely event of it surviving the winter a modified Bailey Comb Change can be considered. Shook swarms and requeening during the summer are suggested methods of dealing with these diseases to ensure healthy colonies for winter.

Feeding

Feeding should be well under way and almost finished by now (mid September). Colonies need about 20kg of stores to survive winter (and even then you will probably need to add fondant in late winter / early spring). Feeding should be with strong (2lb sugar to 1 pint of water, 1kg:630ml) sugar syrup so the bees have less to do to get it concentrated and capped for winter stores – see NBU leaflet on "Feeding Bees – Sugar". Eating unripe stores is one of the causes of dysentery in honey bees. Each full brood frame of honey holds about 2.2kg of honey so you can estimate how much is already in the hive and how much sugar syrup you need to give to your bees to top it up to the required amount. For example, if your bees need an extra 10kg of stores, as honey is 80% sugar, to make 10kg honey will require 8kg sugar made into strong sugar syrup. We are fortunate in this area to have late flowering nectar producing plants such as Himalayan Balsam, Ragwort and Ivy. Ivy in particular flowers late but the nectar is very concentrated and the bees are easily able to reduce the water content and store it as honey. If you don't overwinter on the 8 x 8 double brood method and have a large colony you will need to give them a super to fill with stores. Remember to remove the queen excluder otherwise the bees will not leave the queen to go into the super resulting in isolation starvation. The queen will almost certainly have moved into the super to start laying by the time you do the first spring inspection which is a nuisance but easily dealt with by putting the super under the brood box with a queen excluder between them so she can't get into it to lay. Once all the brood has emerges the super can be removed. The frames should be treated as brood frames.

Ventilation

Damp hives can kill a colony. Metabolising winter stores produces about 20 litres of water! Some of this is re-used by worker bees to dilute stored honey down to a concentration of 50:50 (water:sugar) that is required for bees to be able to metabolise the honey. Open mesh

floors are probably enough to deal with the water produced (although the crown board is often damp at the end of winter). If you have solid floors, putting a matchstick under one side of the crown board should help. Remember not to put the matchstick in until it's cold enough for the bees to be in a cluster otherwise they will fill the gap with propolis as part of their winter hive sealing preparations.

Insulation

Insulation can either be above the crown board or wrapped around the hive (although it probably doesn't get cold enough here for the latter). You can use any material you like as long as it's non-toxic (polystyrene, old jumpers etc).

Predators

And finally – protection from predators. Your entrances should have been reduced down when feeding to reduce the risk of robbing and this will help with defence against wasps. Although it has been a poor year for insects due to the long, cold and wet spring, wasps are making their presence known around the hives, albeit in reduced numbers. Fit mice excluders in October. There is no need to worry about green woodpeckers this far North. And that's it. Hopefully you have strong and healthy colonies ready for winter. All that remains is to strap the hives down so the autumn and winter gales don't over turn them. There should be no need to open your hives unnecessarily. Heft them to check on stores and if you like you can put a varroa monitoring board underneath for a week or two – the debris will let you know where the cluster is and maybe provide other information – especially after the mid-winter varroa treatment.

The Bee Healthy Team
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Email the Bee Health Team. We would love to know about any topics you would like covered in future Bee Healthy bulletins.
You can read previous bulletins and find useful links on the DSBA Bee Healthy web page.
Remember the DSBA Mentoring Team can be contacted via the 'Members Only' section of the website for further advice.