Preparations for Wintering

By Bob Arnold

The beginning of the new beekeeping year starts in September. This seems odd since the bees really don't get going until the spring flowers start blooming. However, your bees must make it through the winter with enough strength and resources to begin the spring with gusto if you are going to make a good crop. The most essential skill in beekeeping for us in the northern latitudes is successful wintering.

Your hives need to be assessed in late August to determine if they have sufficient food for winter. They should have at least the equivalent of one deep box of honey. For most of us 9 deep full frames of honey is sufficient to get the bees through winter and into May. Rarely will any of the bee's use more than a full box of honey before April. Usually it is possible to provide feed for the bees early in April if they run short to carry them into the early nectar sources. If you are keeping your bees in westerns ($6^{5/8}$" boxes) you should be wintering with 3 boxes with at least 13 frames of honey in the top two boxes.

The honey stores should be located in the top box with the bottom box having some honey and lots of pollen. If you have saved frames of honey add them to the top box filling it to the sides. If you are feeding to provide needed stores the bees will generally fill up the top box before storing much in the lower box.

You can use pure cane sugar, pure beet sugar or high fructose corn syrup. The corn syrup used in cooking is not edible for the bees. Molasses is also not edible for the bees. Sugar syrup is easily mixed by taking equal weights (or volume) of cane or beet sugar and hot water (preferably 120^{o} to 130^{o}F) and mixing until the solution clears. The syrup is given to the bees warm (~100^{o}F).

A 2:1 mixture of sugar and water can be used if you just want to add stores to the colony. This mixture is more difficult to prepare but will add weight to the colony faster than the 1:1 mixture. The bees will still brood some but not as much as with the 1:1 mixture. Generally you will need to provide some heat and stirring together when you make up the 2:1 syrup even if you add the sugar to 130^{0}F water. Note that the bees seem to be more eager to consume the 1:1 mixture.

Some people will mix honey with water and feed it back to the bees. This practice has the risk of feeding American Foulbrood spores found in your honey back to the bees. Even if your bees do not have any signs of AFB they may have robbed out some other hive that did have AFB. This can be done but is not a wise practice.

Feeding your bees each fall is generally good practice. The feeding usually stimulates colony brood development giving strong healthy "fat" young bees for winter. Putting your mite controls on at the same time that you feed will help insure that any brood reared will have the best health possible. Feeding pure sucrose to the bees seems to really make healthy bees. You can add Fumigilin-B to the feed to control nosema which

is an insidious adult bee disease effecting most of our colonies to some extent. Note also that the last feed of the year is probably the first feed the bees use during the winter. This feed can be well controlled. Often we will have falls with lots of aphids and the bees' load up on droppings from the aphids—honeydew. This is bad feed for the bees and will cause a serious case of dysentery.

Feeding during September usually proceeds smoothly with moderate strength colonies taking a gallon in 2 to 4 days during weather that varies between 55°F to 70°F. Our average temperature begins to drop below 70°F as we reach the end of September. During October the feeding will start to slow down until, when temperatures stay in the low 50's, most of the colonies will not take the syrup. The bees must be able to process the syrup into the form they can store. This requires the removal of moisture and some sugar conversion. As it gets colder the bees are unable to perform this processing and simply stop feeding. Clearly you must get your syrup on before the temperatures get too low or be prepared to feed your honey in frames.

The colony to be wintered should have a queen that is less than two years old in the fall. A queen can be replaced in the fall by first introducing a young queen to a nuc. The queen is allowed to beginning rearing brood in the nuc before replacing the old queen. This will insure that the bees have accepted the new queen before you have killed the old queen. It is wisest to have the nuc established in August, or at the latest, early September. This gives you a month to observe the new queen's brood. Often if a new queen is going to fail she will do so after the first month of laying.

Once the new queen's brood is observed the nuc can be introduced to the old hive. Simply find and kill the old queen and then shake all of the bees from the top box into the bottom box. Remove the number of frames in the nuc from the top box and replace them with the nuc frames making certain that the queen is present. Place a sheet of over the bottom box and place the top box on the newspaper. This can be done up into early November.

The big unknown in wintering has become mites. Control of the mites or tolerant bees has become imperative if you are to winter successfully. The conventional application of menthol in the form of pellets placed in a mesh bag between or above the brood chambers simply is unreliably ineffective in controlling the tracheal mite. Weather plays too big a factor in whether the tracheal mites receive a fatal dose of menthol. Using the vegetable oil menthol mix soaked in a mechanic towel does seem to work well. This method is well described on the Internet. Simply stated vegetable oil is heated to perhaps 150°F and the menthol pellets or crystals are dissolved in the oil. The solution is then poured into a zip lock bag with some blue mechanics towels. I use a few of the mesh bags of menthol to about a cup of oil and about 5 mechanics towels. Then one towel is placed on the top bars of each box. Use this medication after ambient temperatures are below 70°F. The bees will eventually tear the towels up and remove them.

Treatment for the varroa mite is quite a different problem. The Apistan or Check Mite strips may or may not work for you. The other methods (Api-Life Var and formic acid)

probably will work. Clearly you must find out whether you need to treat and if your treatment is effective. Using the sugar roll, ether roll or the sticky board must be in your bag of tricks. You must become familiar with these methods if you are going to be able to keep your bees alive. The treatment is simple once you know what the infestation level is.

Once you have gotten your bees' fed, healthy and ready with a good queen the next issue is what to do with the hive for winter. Our climate here will allow the bees to easily winter outside with no wrapping or insulation in our coldest winter. Bees rarely die from the cold. They will die because of disease, bad queens, too few young bees, wet internal hive conditions, too little feed, feed in the wrong place, nosema, AFB, mites but rarely too cold of a winter. You can simply leave your bees outside in the cold and they will do fine.

Provide an upper entrance for colony ventilation and for the bees to use. The bees will prefer this entrance for their winter cleansing flights and for early spring development. It also serves as the only entrance during heavy snowfalls and perhaps an iced bottom board.

If this entrance is directly beneath some form of insulation above the inner cover the bees will tend to congregate around the entrance even during the coldest days of winter. Sometimes the cluster will use all of the honey on one side of the top deep box. They will get up to the inner cover and they have exhausted their honey and they will starve with honey just a few inches away. By providing some insulation above the inner cover and some room between the inner cover and the top bars the bees can move around and get to the honey. All you need is two inches of closed cell foam insulation above your inner cover.

The colony is best located in an area protected from the wind. It should be kept in a high spot rather than a low spot where cold air tends trap. However, protecting from the wind is less important than **providing to the colony entrance**, full visibility of the sun between the hours of 12 noon and 3 PM. This is the time of the day the bees will most likely get out and have a cleansing flight. The sun will warm the front of the hive and they will readily break cluster to go out. Note that this condition should be met during the shortest day of the winter. Keep the bottom board entrance to 3/8" height and full width of the hive. Restricting it to a few inches width seems to cause the bees not to keep the bottom board clean of dead bees. Using bottom screen boards during the winter are still debatable.