

## **Making Nucleus Colonies by Brent Halsall      From the Ontario Beekeepers' Association Magazine 03/04/09**

Nucleus colonies (nucs) are small colonies. They are fun and relatively easy to produce and can provide you with mated queens when needed and can also be a source of additional or replacement colonies. Given our recent overwintering losses it is prudent to keep nucs on hand to make up for these losses.

The principles that apply to any division of a colony also apply to making nucs. Specifically:

- a mated queen or a queen cell can only be introduced to a colony that is queenless;
- if a queen cell is used the virgin queen must have an opportunity to mate (weather plays a role in this);
- bees, brood, honey and pollen must be provided.

### Steps in Making Nucs

#### *1) Selection of brood and bees (but not the queen) from an existing colony.*

This can be done by carefully checking frames for the queen or by using a queen excluder. The latter is much safer if you aren't experienced at finding queens or aren't using marked queens.

In using a queen excluder to select brood and bees, frames of capped brood, honey and pollen are selected from a strong donor colony and the bees shaken off back into the donor colony (spaces left in the donor colony are filled with frames of drawn comb or foundation). The shaken frames of brood, honey and pollen are placed in a hive body directly over a queen excluder on top of the donor colony. It is better if the frames do not fill this hive body as this will provide more room so that more bees may cluster on these frames. Early in the season you can start a four frame nuc with one frame of brood plus frames of honey and pollen. Later in the season two frames of brood will be necessary.

In a matter of a couple of hours the frames above the excluder will be covered with bees. In some cases it may be necessary to wait overnight to ensure that the frames are well covered with bees. It is important that the frames are well covered because many of the bees will return to the donor colony later if the nuc is kept in the same bee yard.

If you are making a number of nucs and want to take shaken frames of brood, honey and pollen from a number of colonies they may be placed in one hive body and put above a queen excluder above one colony recognizing that more bees will be taken from this colony.

#### *2) Placement of brood, bees and frames of honey and pollen into a nuc box or hive body.*

When the frames of brood, honey and pollen are well covered with bees they may be placed in a nuc box.

In cool weather the nuc can also be started on top of a strong colony using a regular brood chamber so that the nuc can take advantage of the heat from below. In this case a screened division board or an inner cover with the ventilation hole screened is placed on the strong colony. This board must have a notch cut in the edge to act as an entrance for the nuc and the entrance must face in the opposite direction than the hive below. The entrance must be reduced as a precaution against robbing if there is no honey flow and additional empty frames of comb should be placed in the brood chamber to help moderate the temperature in the nuc.

If you are leaving the nuc in the same yard as the donor colonies from which it was made up stuffing the entrance with green grass (not too tightly) is a good way to delay the bees leaving the hive. If the nuc can be moved to another bee yard more than two kilometers away this will avoid the bees in the nuc going back to their parent

colony.

*3) Allowing the bees and brood to remain queenless for 24 hours.*

Shorter or longer time periods may work as well but may also introduce new concerns. For example if you leave it too long and if the bees have larvae available they may start to raise their own queen cells. In this case destroy the queen cells that they have made before introducing your queen cell or mated queen.

*4) Introducing a mated queen or a queen cell.*

Mated queens are available through queen breeders or bee supply outlets. Queen cells may be purchased through queen breeders, you can produce your own, or swarm or supercedure queen cells from your own colonies may be used. Remember when using swarm or supercedure queen cells that the quality of the queen will be less reliable so it isn't a good idea to do this all the time.

Mated queens are introduced by placing their cage between two frames. Your queen supplier can tell you how to best orient the cage. Queen cells should be gently pushed into a brood comb in the colony ensuring that it is secure, that the cell is not crushed and that there is clearance at the tip so that the queen can emerge. The queen cell should be placed close to bees and brood so that it can be kept warm easily.

*5) Leave the bees alone for one week if a mated queen was introduced or two weeks if a queen cell is used.*

*6) Check that the queen is laying.*

Typical success rate is 60 to 90% with queen cells and sometimes higher with mated queens. Many environmental factors will affect this success rate.

Starting small 4 frame nucs has the advantage in that it requires less resources from your full size colonies. In the event that the queen is not accepted less brood, bees, honey and pollen have been lost. However these small nucs require more attention from the beekeeper. Nucs started early in the season (June) can easily fill a single brood chamber by fall. In the event that they become too populous it may be necessary to add an additional brood chamber and over winter as a double.

Normal colony management techniques such as syrup feeding, medicating, and varroa treatment must be carried out with nucs but must be carried out considering the colonies size.

At any time in the season it is possible to combine a nuc with a recently queenless colony by putting a sheet of newspaper (with slits cut in it) above the colony and putting the nuc on top. The colonies will gradually integrate as they chew through the newspaper.

Colonies started from queen cells will take longer to develop as it takes two weeks before the queen is mated and laying eggs. Virgin queens require 20 degree centigrade temperatures, winds less than 15 kilometers per hour, and an absence of predators such as dragonflies and insect eating birds in order to mate successfully. Nucs started earlier in the season will be correspondingly larger in the fall than those started later in the season. Late July is usually the latest that nucs should be started using queen cells. Small nucs will require special winter protection in order to overwinter them. There are advantages in overwintering four frame nucs if appropriate wintering conditions eg. on top of other colonies and well insulated or indoor wintering can be provided. Overwintered four frame nucs develop into strong production colonies very quickly.