National Bee Unit

FAQ 15

The Food and Environment Research Agency

Using Artificial Swarms for Varroa Control

Many beekeepers perform artificial swarm manipulations to either control swarming or increase colony numbers; however with a few minor changes artificial swarming can remove the greater portion of a varroa mite population.

Why should I consider using this procedure?

Used with infested colonies in the swarming season it can form an important control tool within an integrated pest management system. During this season medicament controls may not be practicable during nectar flows. There are many bio-technical varroa control techniques, but one of the most acceptable, effective and beneficial is managing an artificial swarm to control varroa mite levels.

How effective is it?

It is claimed to remove up to 90% of the mite population.

How does it work?

The key areas of varroa biology on which these systems rely, and with which bee keepers should have a clear understanding are:

a) Varroa mites mature mostly on younger house bees.

b) Unless a colony is collapsing flying bees carry very few varroa mites. Scientists have calculated that an artificial swarm made up of the flying bees only, (including 5% drones) will carry about 1.7% of the colony mite population.

c) Mature varroa mites enter open brood, just prior to capping over, for their reproductive phase.

Therefor if a colony is broodless it can be baited by inserting combs of open brood. The mature mites will enter the cells to reproduce and when the cells are capped over they can be removed and destroyed.

How is it performed?

Many division methods have been described but a simple system, based on the 'Pagden' method of swarm control and developed by Dr. Wolfgang Ritter is as follows:

Select a day when a colony is showing signs of swarming and the bees are flying freely.

Day 1 Move the chosen colony at least one metre to one side of its original site. This colony is known as the 'parent'. On the original site place a complete new hive, containing new unused drawn brood comb or foundation, built up in the following way: floor, queen excluder, brood box containing comb/foundation, crown board, feeder and roof. This colony is known as the 'swarm'.

Examine the 'parent' colony, find the queen and gently place her in the new brood chamber. Do not transfer her on a brood comb as this will only transfer more varroa mites into the 'swarm'. Destroy any sealed queen cells if present and leave the supers on the parent colony.

Unless there is an adequate nectar flow the swarm colony will need feeding. If using foundation the feed will encourage the bees to draw out good even combs. The purpose of the queen excluder below the brood chamber is to prevent the queen absconding.

Day 7 Examine the parent colony. Destroy all queen cells except one, which should preferably be unsealed. The queen cells cut out could be used in nuclei or mini-nuclei to raise queens for re-queening later. Place a cell protector around the selected queen cell that will allow the queen to hatch and the workers to feed her, but will not allow her to fly and mate.

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(Keeping a virgin queen in this colony will maintain its social structure.) *Optionally* To maintain adequate food for the artificial swarm, remove the supers, shake out the bees in front of the colony and place the supers on the swarm colony. The parent colony will probably need an empty super to accommodate the bees. Feed if required.

Examine the swarm colony. Remove the feeder and check that there is drawn comb and brood present. Remove the queen excluder from under the brood chamber and place it over the brood chamber. Place the supers on the hive if applicable.

Day 21 Examine the swarm colony and take out two combs of open brood. Replace them with new clean drawn combs or foundation.

Examine the parent colony. All worker brood in the colony should have hatched. Cull any drone brood remaining. Remove two brood combs and place the two open brood combs from the swarm into the centre of the brood chamber adjacent to the caged queen. These are bait combs. The old combs removed should be melted down and recycled. The virgin queen remains in her protector or she could be relocated into a queen cage. Feed if required.

Day 30 Examine the parent colony. Remove and destroy the bait combs that will by now be capped over. The caged virgin queen is culled and the colony re-queened perhaps from a nucleus set up at day 7. Do not allow bait combs to hatch, which will occur from day 33, as this will re-infest the colony.

Last step

Depending on requirements either

1) If an increase in stocks is required keep both colonies and, if necessary, Replace the old queen in the swarm colony or,

2) If no increase is required then when the new queen is in lay cull the old queen in the swarm and re-unite with the parent colony.

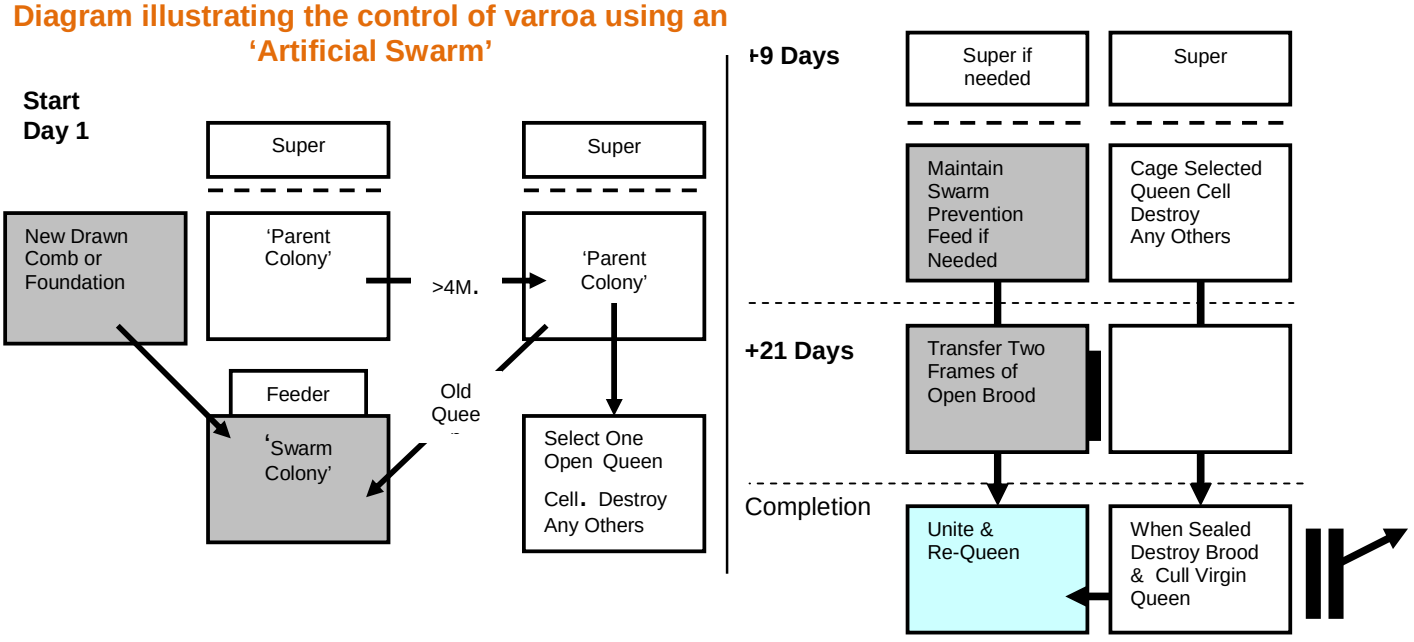
Variation.

The parent colony could be placed over a closed crown board on top of the artificial swarm and equipped with an entrance flying bees in the opposite direction to the swarm colony.

What else do I need to be aware of?

Experience has shown that the swarm colony tends to remain small so ideally should be provided with drawn comb rather than foundation. For beekeepers using British Standard frames this is easily obtainable during the previous season by using some brood chambers, filled with foundation, as supers and extracting the combs. If young bees fly from the parent to the swarm then the efficacy of the system will be reduced so increasing the distance that the parent colony is moved may be beneficial.

Diagram illustrating the control of varroa using an 'Artificial Swarm'



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