Animal & Plant Health Agency

National Bee Unit

Using Drone Brood Removal as a *Varroa* Control

Current scientific data indicates that the removal of sealed drone brood will slow mite population growth, in a bee colony, by about 50%. Though it's use alone will not prevent a colony from being overwhelmed, it is an important tool, within an integrated approach, to *Varroa* control. With the advent of *Varroa* resistance to pyrethroid treatments, such as Bayvarol® and Apistan®, the removal of sacrificial drone brood can enable other less effective controls or medicines to reduce mite infestation to a safe level.

How does it work?

Varroa mites reproduce within sealed bee brood. A hormone that is more prevalent in drone brood cells triggers this. One mature mite entering an *Apis mellifera* drone cell will emerge together with the imago drone and five daughter mites that have an average survival rate of 83%. Mites entering worker brood cells will emerge with three daughters that have a survival rate of 46%. Female mites have the ability to reproduce up to three times within their life cycle, so the potential for large-scale increase of mite populations are clear. *Varroa* mites show a preference for being near the centre of the brood nest and therefore a frame of drone comb can be added as a bait trap. As the bee larvae mature, mites enter the cells to reproduce, prior to the cells being capped. When the comb is sealed it can be cut out or removed taking with it any mites that are present. However if these combs are left to hatch then the population of *Varroa* will increase. This procedure can only be used between April and July in thriving colonies and during drone rearing months. If mite populations are at a level where control will not be required, then drone brood removal should be delayed. For more information go to the Integrated Pest Management section of the

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'*Managing Varroa' leaflet and read the 'Using monitoring to choose the level of controls to employ'*.

How effective is it?

Research indicates that when performed correctly, it can reduce mite population growth by 50%.

How is it performed?

There are three simple ways of performing this procedure.

a) Full Brood Comb. A brood comb is fitted with drone brood foundation and placed adjacent to the brood nest. The bees will draw out the foundation, the queen will lay eggs into the comb and when it has been capped over the frame can be removed. The comb can then be cut out and destroyed. If a narrow strip of the comb midrib is left at the top of the frame, similar to a foundation starter strip, the frame can be returned to the colony for re-use.

b) Shallow Comb. If a shallow 'super' frame of worker comb is placed between two fully drawn brood comb frames, the bees will draw out comb below the bottom bars. During the drone season this will invariably be drone comb. When sealed over it is simple to cut off using the hive tool or a knife. The frame can then be re inserted for another cycle.

c) Cartridge. This is a refinement of b). A small frame is made up which clips or is held by two pins to the base of the shallow frame. When the time comes for removal it is removed and a replacement cartridge fitted.

What else do I need to be aware of?

Do not leave bait drone combs in the hive longer than 23 days. Drones may start hatching on day 24, which could lead to an increased mite population. If you carry out swarm management on a nine-day rota then removal on day 18 fits in well with five 'safety' days to spare. With system b) & c) it can be effective if two frames are used on an alternate removal period of 9 days. At the end of the season, sometimes earlier, bees will build worker comb rather than drone in the traps. You will not wish to destroy this brood so move the frame to one side of the brood nest. When hatched and as the brood nest reduces in size the frame can be moved to the end of the chamber for subsequent replacement.

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