Drone uncapping

BACKGROUND

In colonies with large brood nests, up to 85% of Varroa mites can be found within capped brood cells, with a preference for drone brood. Therefore, uncapping drone brood and examining pupae is an effective method for detection of Varroa mites. This method is also effective for Tropilaelaps mites, which spend the majority of their lifecycle within honey bee brood.

It is recommended that all beekeepers conduct this surveillance technique as it is rapid method, very little equipment is needed and it can be carried out easily as part of a routine hive inspection. The disadvantage of this method is that the drone brood are killed.

The preference of Varroa mites for drone brood is strongest in the spring and decreases towards the end of the drone rearing season. Therefore this technique is most sensitive when conducted in spring. However, this method should not be solely relied upon for monitoring the presence of brood parasitic mites, such as Varroa mites. The alcohol wash is a more accurate method for determining colony/apiary mite levels.

Equipment required

- Protective clothing, smoker and hive tool
- Cappings scratcher or wide blade shearing comb mounted on a handle
- Piece of white paper or cardboard
- Magnifying lens (if available)

Procedure

- Light a smoker, open the hive and remove a frame from near the centre of the hive which contains a large portion of drone brood. If the queen is present place her back in the hive. Shake the remaining bees back into the hive.
- Push the comb of the scratcher through a patch of capped drone brood and pull a large patch of pupae out all at once. Note that this will kill the drone brood.

Cappings scratcher pushing through drone brood. Image courtesy The Food and Environment Research Agency (Fera), Crown Copyright.

- Uncap drone brood on at least three brood frames from randomly selected hives in an apiary. Uncap about 100 drone brood per sample.
- Examine each pupa for reddish-brown mites, which can be clearly seen against the white bodies of the drone pupae.

Cappings scratcher with pupae removed from drone brood cells. Image courtesy Kiwimana.co.nz 2011.

- Mites are easier to see on pupae that have pink eyes rather than those that have taken on adult colouration.
- Pupae that are younger than the pink-eyed stage are often too soft and fall apart when the scratcher is pulled out.

Pink-eyed drone pupa with Varroa mite attached. Image courtesy www.Bugwood.com

- The comb can be tapped over a piece of white paper or cardboard. Mites that do not come out with the pupae may fall onto the card.
- After removing the drone pupae, check the bottom of the drone brood cells for any mites that may not have attached to the removed pupae.

Adult and juvenile Varroa mites present in the bottom of a drone brood cell from which the pupa was removed. Image courtesy CSIRO

Reporting

- If Varroa mites or Tropilaelaps mites are suspected, report the finding immediately to the relevant state/territory agriculture agency through the **Exotic Plant Pest Hotline (1800 084 881)** or by directly reporting to the state/territory Chief Plant Health Manager.