

Drone Brood Removal for the Management of Varroa Mites

An integrated pest management (IPM) approach to beekeeping reduces reliance on conventional chemical treatments and incorporates a variety of alternative methods to decrease the incidence of pests and disease, reduce the risk of chemical residues in honey and hive products and maintain sustainable treatment options.

Drone brood removal is a cultural treatment for Varroa mite control which uses drone comb to ‘trap’ mites. Varroa have a strong preference to reproduce in drone cells rather than worker cells and become confined in capped drone brood. Thus, if the comb is removed before the drones hatch, many mites are removed as well. Drone brood removal significantly reduces the number of Varroa mites in a colony with no negative impact on worker population or honey production. However, this method is only effective in colonies strong enough to rear drones and it will have little impact if used as the only control method when Varroa mite populations are high.

Materials:

Plastic drone frame or foundation: imprinted with larger drone-sized cells, available from bee supply stores. Here are a few types:

1. **Full drone frame:** standard size frame for standard size box.
2. **One-half drone frame:** remove the lower half of comb from one frame of worker brood. The bees will draw out drone comb in the empty space.
3. **Shallow frame in standard box:** Similar to the half drone frame, bees will draw out drone comb below the shallow frame.

Follow these steps to conduct drone brood removal for Varroa management in your colonies:

1. **Insert the drone brood frame:** Using a drone brood frame will encourage localized drone production during the drone season. Choose one of the following to use:
 - a. In April/May, remove an empty or feed frame and insert the drone brood frame into the brood chamber beside the brood nest (position 2 or 3). Use one frame per brood chamber.
2. **Wait:** Leave the drone brood frame in for 24-28* days at a time. This cycle provides time for the bees to draw out comb (or clean out dead drone brood), the queen to lay eggs and the drone brood to develop and be capped over. Checking the frames will give you a better indication of when the drone brood can be removed. It is important that the drone brood is removed on time, before the drones hatch at the end of their 24 day development period, or you will be increasing the rate of mite population growth!
 - a. If freezing drone frames, you should replace the frames every 24 days; the bees only need a few days to clean out the dead drone brood.



Pierco Inc.
680 Main St.
Riverside, CA 92501 USA
P: +1 (800) 233-2662 | F: +1 (909) 596-1452
E: info@pierco.net | W: pierco.com

3. **Get rid of the drone brood:** You can dispose of the capped drone pupae and accompanying Varroa mites in one of the following ways:
 - a. **Scraping:** If using plastic foundation (i.e. plastic drone frame), scrape the brood off with a hive tool. Contain the scrapings and dispose of them away from the bee yard to prevent robbing. Bees robbing the scrapings will allow the discarded Varroa to crawl back onto the bees. The frame can be placed back in the colony immediately after scraping for the cycle to be repeated.
 - b. **Cutting:** Without a plastic foundation, the drone comb can be removed by cutting it from the frame using a hive tool or knife. Dispose of the drone brood away from the bee yard. The frame can be placed back in the colony immediately afterward.
 - c. **Freezing:** This method avoids having the bees continually rebuilding comb, but requires two sets of drone brood frames. Remove capped drone frames and replace with another drone frame. Store the capped drone frames in a freezer. Exchange frozen drone frames with the drone frames in each colony every 24 days. Allow frozen frames to return to room temperature before placing in the colonies. Transmission of diseases between colonies can be reduced by marking frames and returning them to the same colony after each cycle.
4. **Repeat:** Continue removing the drone brood until late August/September. At that time, drone frames can be moved to the side of the brood chamber to be used as feed storage frames for the winter.



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