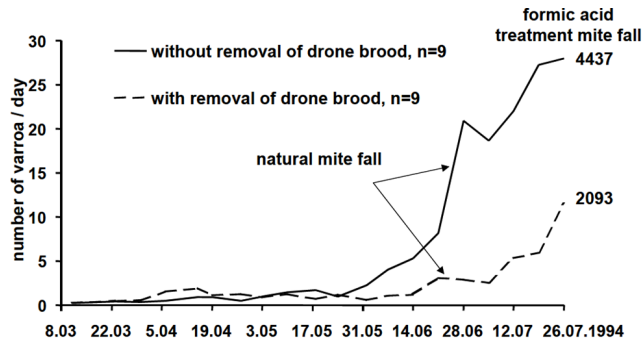


## Practical Experiences

The opportunity to apply the **Drone Brood Removal Method (1)** depends on the bees preparedness to build combs and to breed drones. This usually begins in March/April and ends in August, which highlights the Drone Brood Removal Method as an early season Varroa control when unimpeded colony build-up is desirable.

The practical experience is that the Drone Brood Removal Method can reduce the development of the Varroa mite population below the treatment threshold of 5 mites per 100 bees until later in the summer, when additional Varroa control methods can be applied such as other biotechnical methods or some chemical agents that rely on the absence of honey supers in the colonies.

The graph below shows the reduced development of the Varroa mite population through the application of the drone removal method.



Suppression of Varroa mite development through drone brood removal (2003 research paper of the Swiss Bee Research Centre)

The exchange of the drone frame inserts as part of routine inspections constitutes minimal extra time and work and is suited for hobby and small commercial operations. Uncapping the frozen combs with a large serrated kitchen knife takes less than 1 minute.

## Short and Sweet

### Advantages

- Increases productivity
- Part of inspection routine
- Applicable during honey flow

### Requirements

- Custom made Split Drone Frame required
- Regular inspections to exchange inserts
- Freezer space for storage of inserts

### Timing

From April to August

### Split Drone Frame

The Split Drone Frame consists of an empty wood frame and 3 inserts of which 2 inserts are fitted into the wood frame. The required materials and how-to-do steps with detailed illustrations are presented in a worksheet provided by the Comox Valle Bee Club. It can be downloaded from the club's website or by opening this QR code:



### Design by

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Images and Graphics: © CVBC



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# Comox Valley Bee Club



## The Drone Brood Removal Method

### Biotechnical Varroa Reduction



## The Concept of the Drone Brood Removal Method

The Varroa mites that normally cling to the bees year round are all females. For its reproductive phase during the breeding season the female mites enter open brood cells that are about to be capped, whereby especially drone brood cells act as magnets for Varroa mites. Research shows that Varroa mites are up to 12 times more likely to enter drone cells versus worker brood cells.

Removing regularly drone frames after they have been capped, can therefore reduce the level of Varroa mites in a colony.

The removal of drone brood had been traditionally practiced to reduce the amount of drones in the colonies that otherwise can amount to up to 17% as in feral colonies. The rationale is that the reduction of drones in production hives is reducing their tendency to swarm while increasing bee resources for colony development, pollen and honey collection.

One dedicated drone frame in a colony with 20 frames will usually satisfy the bees' need for drone breeding. Dedicated drone frames in a colony can also reduce the amount of drone sized cells elsewhere on regular combs.

In order to offer a continuous supply of drone cells that are about to be capped to the female Varroa mites, it is necessary to maintain drone frames in different stages of development within the colony. This is achieved with a "Split Drone Frame" that consists of two smaller inserts, which can be exchanged alternately. The exchange of the drone frame inserts is usually done during the weekly inspections or on an as-needed basis, when there are capped drone cells on one of the inserts present.

## Application of the Drone Brood Removal Method

### Step 1

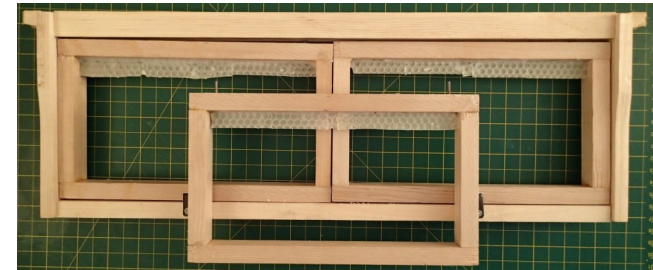
- Split Drone Frame: Prepare an empty wooden frame with 3 inserts of which 2 inserts are to be mounted into the frame. Attach a strip of wax foundation material to the inside of the upper bars of the inserts.
- Insert the Split Drone Frame into a colony at the edge of the brood nest, and allow the bees to draw out the combs, which will consist of drone sized cells.

### Step 2

- Replace one drawn insert with the third insert which has not been drawn out yet. This will initiate the pattern of alternating exchanges of inserts that are in different stages. While one insert is being capped, the other one will just contain fresh eggs and young brood.
- Check regularly (e.g. weekly) and remove the insert where the brood cells are capped and before the drones can hatch. Replace the insert with a frozen and uncapped insert or one where the closed drone cells had been cut out.

### What to do with the capped frame inserts?

One option is to cut out the closed drones cells and discard them safely. Another option is to freeze the frame inserts for at least 2 days and then to uncapp them before inserting them again into the Split Drone Frame. The worker bees will clean out the cells and the queen will again lay eggs into the drone cells. By "recycling" the drone combs, the draw on the bee's resources is minimized.



*A prepared split drone frame with 3 inserts.*



*The bees drew out the drone comb, the other side is replaced.*



*Drone brood inserts in different stages of development.*



*Uncapping frozen brood cells.*