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Varroa Mites and how to catch them

Here is the method used to kill 95% of the varroa mite in a hive

This method is developed by [Johan Calis](#), [Joop Beetsma*](#) (died in Marz '99), [Willem Jan Boor*](#), [Jan van den Eijnde**](#), [Aad de Ruijter**](#) and [Sjef van der Steen**](#)*

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We call it the Darreraat methode. “drone comb method”

It looks like a very labor intensive method, but when you really look at it except for the one week before implementing the swarm prevention program wherein you give all the brood from one hive to another hive, the rest is pretty much a normal swarm prevention split. Also, Varroa mites may eventually become resistant to Apistan and other Mite Solutions, and then what? AND the accumulation of it in HONEY, WAX, PROPOLIS. (you never get it out!)

Trapping comb methods are in general more labor intensive compared to acaricide treatments. The integration of trapping comb methods and swarm prevention, largely disposes of this disadvantage. In fact, the extra labor consists only of management of the drone combs and may well be exceeded by the advantage of producing bee products that are free of acaricide residues.

Here in Europe there is a famous beekeeping book called “The week-end beekeeper”. Seems like it is written for this method.



Introduction

Varroa mites are most often found in drone brood. Capturing mites in drone brood is nothing new. In fact, it was the first method used to combat the mites. But since not all mites were captured and many survived in the worker brood, this method was relatively ineffective and other methods were employed.

Varroa mites propagate in brood cells. Research from the University of Wageningen (The Netherlands) has shown that the Varroa mites are 12 times more likely to enter drone cells versus worker cells. Therefore, if a situation is created wherein all of the mites are on the bees (and not in any brood) it is possible to catch a high percentage of the mites with a couple of drone cell brood frames. Capturing mites in **broodless** hives with drone cell frames is very effective. A broodless period is essential to this method

since the mites, all on the bees, will be caught in the drone cells. This principle is used in biotechnical mite control methods.

Premises

- It is possible, in a broodless hive, to capture an adequate number of mites (500 cells per kilo (2.2 lb..) of bees).
- Mites do not enter brood cells for the first 7 days after an egg has been laid. The brood cells can be moved during that time between hives without the risk of transporting mites.
- For a hive to successfully care for a frame of drone brood, it must have at least 1 brood box.



An Overview of the Drone Comb Method

Catching mites in early springtime:

During the first spring inspection, a frame with drone cell foundation is placed in the middle of the brood nest. This frame is removed when the majority of the drone cells are capped. Before the swarm season, one drone brood frame should always be present in the hive. This way the drone brood frame will be quickly built and mite infestation is checked. According to research from The University of Wageningen, it appears that the mite population will be stable at this point, and not be able to grow.

Catching mites during the swarming season:

In this method sequence, we will work with two hives. There is also a one hive sequence. The actions will include creating a broodless period on one hive and swarm prevention split on the other hive. The result will be three relatively swarm proofed mite-free hives.

The broodless part:

Take all of the worker brood from hive 1 and install into hive 2

The result is all the mites that are left in hive 1 are on the bees and these mites can now be caught by an “egged / larvaed” drone cell frame. This drone frame had been built up during the week before this event by putting one frame of drawn drone comb into the hive. This frame stays in the hive to catch the mites. Two days before they are capped the mites will enter them. By the time new worker brood of hive 1 are ready to be capped the mites are already trapped in the capped drone cells. When enough drone cells have been capped (500 cells per 2.2 lb.. bees), the frame can be removed, uncapped, and pupae cleaned out along with all future varroa for this hive.

The split:

At the moment hive 2 gets the brood of hive 1, one drone cell frame is put in the middle of the old queen’s broodnest and a queen excluder in between the hive bodies. After one week it will be easy to make an artificial swarm without any brood, using the old queen, the bees of 6/7 frames, and the drone frame. When this drone frame is capped, removed and cleaned, the fight on the varroa in the artificial swarm hive is finished.

Since Hive 2 is left queenless, a new queen will be raised since brood in all stages were present. This may

be a great opportunity to requeen or you can let them raise a new queen. During the remaining weeks Hive 1 will supply this hive with “egged / lavaed” drone frames. Two egged drone frames are moved from hive 1 to hive 2 (one week between them). As those frames are closed, removed and cleaned, the fight on the varroa in hive 2 is finished off.



The method

Condition of the successful use of the method

- Strong hives: at the beginning of springtime, a hive has to have a minimum of one broodbox and one super with bees.
- For each hive, 2 drone frames are necessary. You have to buy drone foundation and attach them to a normal broodbox frame. Since you are going to uncap the dronecells and thrust the larvae out, it is better to use wired foundations.

Description of the method in sequential parts (index)

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Over wintering

During April, inspection takes place. Strong hives have to be made by combining two small hives.

Put in, control and cleaning of the drone frames

- You have to buy drone foundation and attach them to a normal broodbox frame.
- The bees will work on the drone foundation to make drone cells.
 - - there will be no drone cells (or next to none) on the other frames .
 - - worker foundation (attached at the same time) will be built into worker cells without drone cells.
 - - trapping mites in drone frames 95% of the varroa will be removed from a hive.
- In testing, it appears that most of the drone cells were built and capped after two weeks. Sometimes it takes longer. It is good to remember: drone >>> 3 days, egg >>7 days, larva >>14 days, pupa.
- There are three stages you could find on the drone frame.
 - no brood or only eggs. This frame can stay for three weeks in the hive.
 - eggs and larva present. This frame can stay for two weeks in the hive.
 - **bias (brood in all stages)** can be found. The moment the drones emerge from the cell on this frame, it can be calculated back to the moment of putting the frame in the hive and the information obtained on earlier inspections. Assuming that the first capped drone cells are found, the frame can stay in for one more week, but keep in absolutely no longer or the catch method will become a breeding method.

- Estimate/count the closed drone cells. It's good to write the stage of the broodcells development on the hive protocol chart. Keep good records!
- How do you remove the larva and pupa from the capped frames? A good method is this: uncap the cells with a serrated knife or your normally used honey uncapping tool, thrust the larva out. (it is good to mix the drone larva with the chicken feed, they love it!!)(but our [teacher](#) talks about eating them!! Ask him for a recipe, he will be angry with me) Clean the cells with water, dry it in the air, use it again. Remains of pupae should be washed out of the comb with a jet of water and the drone combs should be stored dry until reuse, to prevent growth of fungi.
- I eat them to now. They are delicious!!!!

The catching of the mites in the early springtime

- During the first inspection, a drone foundation frame is put in the middle of the broodnest. It is recommended to mark that frame with a thumbtack/pin and write the hive number on it. If the frame isn't drawn out on the next inspection, you should think things over that this hive may be too small.
- When the frame is capped, it must be removed, and a second frame must be put in. The first frame should then be uncapped, larvae removed, cleaned and dried, and so on. During this period there should always be one drone frame present in the hive.
- The process of putting in drone frames in the hive should continue until the beginning of the swarm season.

Catching the mites in the swarm season:

- First choose the dates for the swarm season. Usually in May, depends on: honeyflow, hive development, personal preference.
- At least 1 week before that date (week 1 in regards to week 2), place a queen excluder between the two hive bodies of the hives with the queens in the bottom.

Week 0

One week before the swarm protection starts, a cleaned out drone frame (A) is put in hive 1. Depending on the development of the already present drone frame, there are now a maximum of two drone frames in the hive. It is important that the last frame in (A) gets "egged" so place it in the middle of the broodnest. It is good to have an egged drone frame present in case a swarm would have to be hived. With the egged / lavaed drone frame you can catch the mites from a swarm.

Week 1

- Capped honey can be harvested {hope so :-)}
- **Hive 1**
Remove all the brood from hive 1 and install in hive 2 except the drone frame (A). Examine any earlier drone frame that may be in, most likely it can be removed, cleaned, etc. This hive is given frames of comb and/or or new frames but make sure there are enough frames of comb for nectar/honey (the bees have nothing else to do.) The drone frame (A) is left in to catch the mites on the bees.
- **Hive 2**
All the brood of hive 1 is received. This can be done above a queen excluder to make it easier to find the queen the following week. Any present drone frame should be examined to see if enough drone cells are capped, and if so then removed, cleaned, etc. An empty drone frame (B) must be put in the middle of the broodnest, i.e. underneath the queen excluder.

Week 2

- **Hive 1**

Remove the capped drone frame (**A**) which ends the sequence for hive 1. Most of the time you will NOT need a swarm protection program on this hive.

- **Hive 2**

First examine the drone frame from the previous week. If the frame doesn't contain a lot of cells with fresh eggs, then postpone all events.

- Make an artificial swarm of hive 2

- When you make a **VEGER*** with the bees of 7/8 frames it is good to move the hive on to another place (6 Km/4 miles) because of backflying bees, "the queenright hive" will probably be too small to attend to the drone frame.

* Normally in Holland we use the technical term "veger" or "vlieger" for an artificial swarm. Here's an explanation:

"Veger" >>>[literally=brush] The hive stays in the old place with all the brood. The queen moves with the bees of 7/8 frames and normally two frames of **BIAS** (except when using this Method.) Queen cells on the old place with all the flying bees. The queen goes to the new place with only the housebees from the 7/8 frames.

"Vlieger" >>>[literally=flyer] The hive with the queen first gets moved to a new location (only a few meters.) Set a new hive at the original (old) location with normally two frames of bias (except when using this Method.) After a half hour the queen -easy to find when all the flying bees are already back to the original location-is placed to the old location. The returning field bees will accept the new hive as their home. Queen cells will become on the new place with only the housebees. (They needs food!!!! and a very little entrance to protect against robbing)) The queen gets put back on the old place with all the flying bees.

- The drone frame (**B**) goes with the artificial swarm, but **no brood**. Hive 2 is now queenless, so queen cells will be built. (Start counting your 13 days!) Depending on the situation, the earlier drone frame that was put in can be removed, cleaned, etc.

Week 3

- **Hive 1**

Put in empty drone frame (**C**)

- **Artificial swarm**

Remove the capped drone frame (**B**) thus ending the sequence for this hive.

Week 4

- **Hive 1**

Change "egged/larva" frame (**C**) to hive 2. Puts in a new drone frame (**D**)

- **Hive 2**

On the thirteenth day a new queen will emerge (or another queen can be introduced.) Put in the egged/larva frame (**C**) of hive 1. During the next week the last/old brood will emerge. The drone cells are specially for the mites on the bees, so mites spread by back flying bees should be negligible.

Week 5

- **Hive 1**
Change the “egged/larvaed” frame (D) to hive 2.
- **Hive 2**
The drone frame (C) can be removed, cleaned, et. Install frame (D) from hive 1.

Week 6

- **Hive 2**
Remove frame (D), clean, etc.

All in a table

	week 0	week 1	week 2	week 3	week 4	week 5	week 6
hive 1	put in a frame of drone-foundation (frame A)*	drone cells will have larva		put in a frame of drone-foundation (frame C)*	put in a frame of drone-foundation (frame D)*		
		remove ALL the brood to hive 2 only the drone-frame (A) stays	remove, clean frame (A)**				
hive 2		receive ALL the brood from hive 1, place a queen excluder, queen in the bottombox			put in the drone-frame from hive 1 (frame C)	put in the drone-frame from hive 1 (frame D)	
		put in a frame of drone-foundation (frame B)*	queen raising program ?	queen raising program ?	queen raising program ?	remove, clean frame (C)**	remove, clean frame(D)**
artificial swarm of hive 2			make an artificial swarm of hive 2 with queen and drone frame (B)	remove, clean frame (B)**			

			but, NO brood				
	week 0	week 1	week 2	week 3	week 4	week 5	week 6

** When the honeyflow is on, put it down in the broodnest, otherwise the bees will store the nectar in the cells.*

If the flow is normal than the droneframe comes in the upper broodbox, in the middle of the brood.

/ Frame A will become frame C; frame B will become frame D*

Control of the effectively

One frame in Holland (foundation 198 x 340 mm) counts 3000 drone cells.

One Langstroth deep frame counts 3225 cells per side, 6450 total frame.

Hive 1 and the artificial swam

A hive with one kg (2.2 lb..) bees (+/- 7 broodframes with bees) can effectively be stripped of varroa mites with 500 drone cells, a hive with 5 kg (11 lb..) bees need 2500 cells. In practice, this means that the war on the mites in a swarm is effective with 500 closed drone cells. In hive 1, the largest percentage of the mites are going to hive 2 because of the change of the total brood. The mites on the bees will be caught by the remaining drone frame.

Hive 2

Here, the last two frames that are “egged/larvaed” in hive 1 and capped in hive 2, are the most essential for the effectiveness of the method. If 2000 drone cells are capped, the mite problem is settled. If that number is not reached, then it is necessary to put drone frames in until the new brood of the new queen will be closed. The effectiveness must be determined by counting the capped drone cells.

Control on the end of the season

The number of mites in a hive (during brood season) can be found by counting them on the bottom sheet in one day and multiplying that by 50.

If there are no more than 10 mites a day, it is not likely that the mites do measurable harm.

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Realization: [Jan Tempelman](#)

Apiservices - Virtual Beekeeping Gallery - [Homepage](#)