

PRACTICE ABSTRACT no. 2

Preparing drone-free mating boxes for controlled mating in small breeding operations

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PROBLEM

Controlled mating is required for genetic improvement of any economically important species in agriculture. In honey bees, it is particularly difficult to achieve controlled mating as honey bee mating biology is quite peculiar. Beekeepers can assist the situation by preparing drone-free mating boxes for the mating station and thus prevent intrusion of foreign (for example, drones without known origin) to the drone congregation areas around the mating station.

One of the most popular ways to form the mating nuclei is to use dry bees and painstakingly separate drones from worker bees in the big cages using pistons with a queen excluder, which is time consuming.

SOLUTION

It is possible to accelerate this process by using a mating box with a super and a queen excluder. The queen excluder is attached to the bottom rim of the super using a thin layer of silicon glue, forming a filtering funnel, tightly fitting on the top of the base mating box. This allows checking the boxes without the danger of drone contamination.

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The one-day old virgin queen in a transport cage, plugged with sugar dough, is placed on top of the sugar dough in the feeder of the mating box base. The super is placed on top of the mating box.

Dry bees are then dosed using the appropriate size cup into the super, which is immediately covered with a lid. The mating box is then transferred into a dark cellar, where bees form a small nucleus colony around the queen releasing her out of the cage at the same time. As drones are too big, they cannot follow through the queen excluder and stay on the top side.

Nucs are placed on location on the night of the third day and the opening is set to "bee", allowing bees to start foraging in the morning. Around the sixth day, the mating boxes can be safely checked, and drone-containing supers removed.



BENEFITS AFTER THE INTRODUCTION

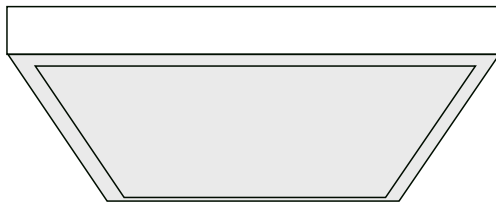
- cutting down time in mating nuc preparation
- improving the drone-tightness at the mating station
- increasing the genetic progress

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PRACTICAL INSTRUCTIONS

Requirements

1. Components of the mating box



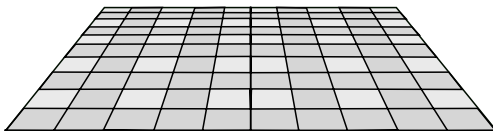
Mating box lid



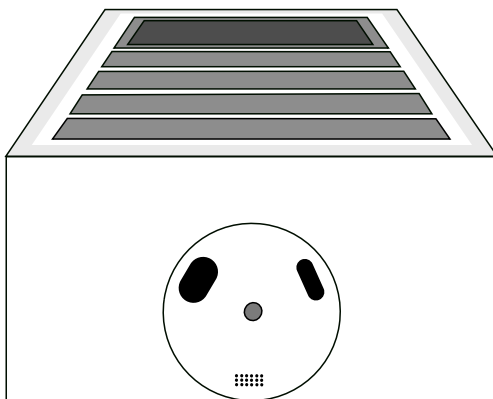
Transparent
PVC cover



Mating box
super



Queen excluder
- cut to fit
- thin & hard PVC



Mating box base
- complete with frames with comb foundation
- with internal feeder filled with dough

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2. Dry bees

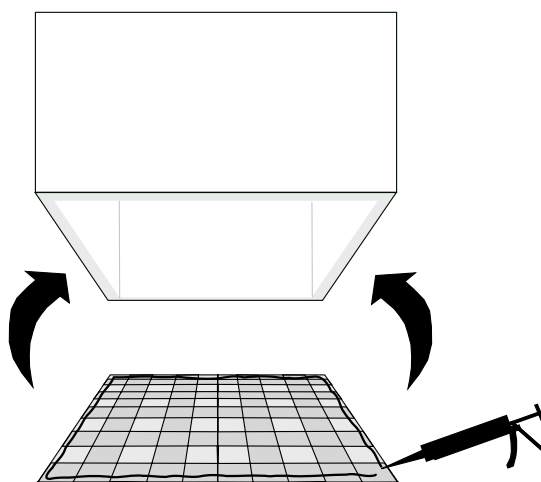
- Either brush your own or purchase them. Make sure you get the young workers.
- Half litre cup is suitable for dosing 0.150 - 0.160 kg of bees into baby mating box - Kieler-type.
- 10 kg of dry bees should be enough for 60+ mating boxes of mentioned size.

3. Sprinkler with water and 10 % lactic acid

- Lactic acid makes workers stick together, making them easier to distribute and to knock down the mite count.

Step 1: prepare the mating box super

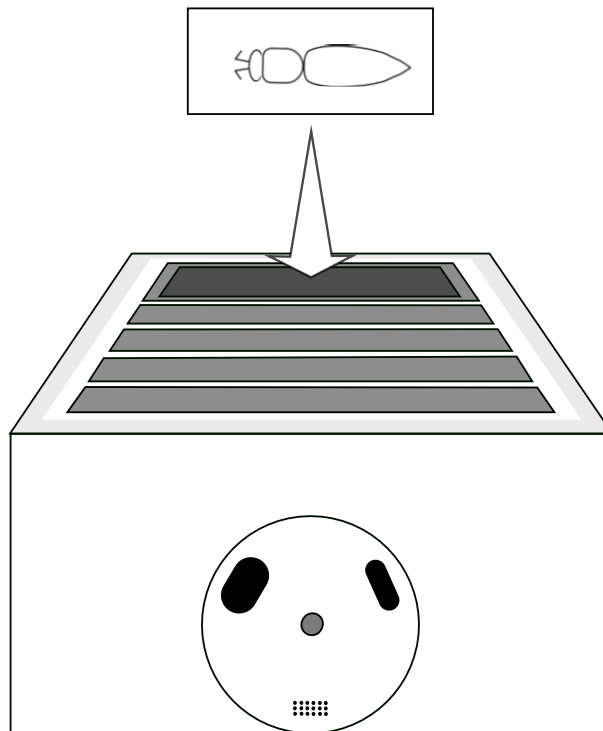
1. Cut the thin PVC queen excluder to fit the bottom rim of the super.
2. Use silicon glue to attach the queen excluder.
3. Wait for a night to get the odour out.
4. Verify the tight fit between the mating box and its super after attaching the queen excluder.



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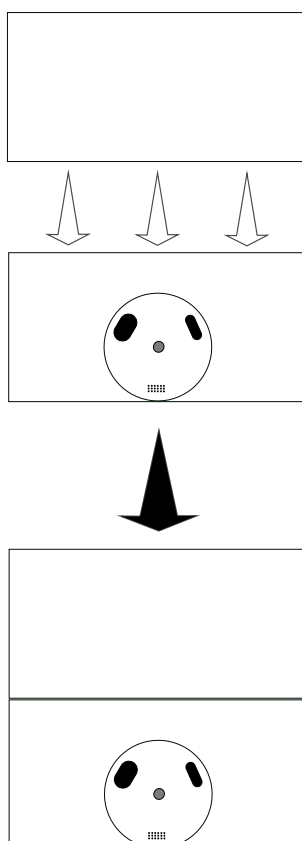
Step 2: prepare for pouring the bees (1 person)

1. In the mating box base, fill in the feeder with sugar dough. Leave just enough space for the cage containing the queen.
2. Place the cage with the queen on top of the sugar dough, making sure it is plugged only with dough plug.



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3. Assemble the mating box by placing the modified super on top, ensuring tight fit.

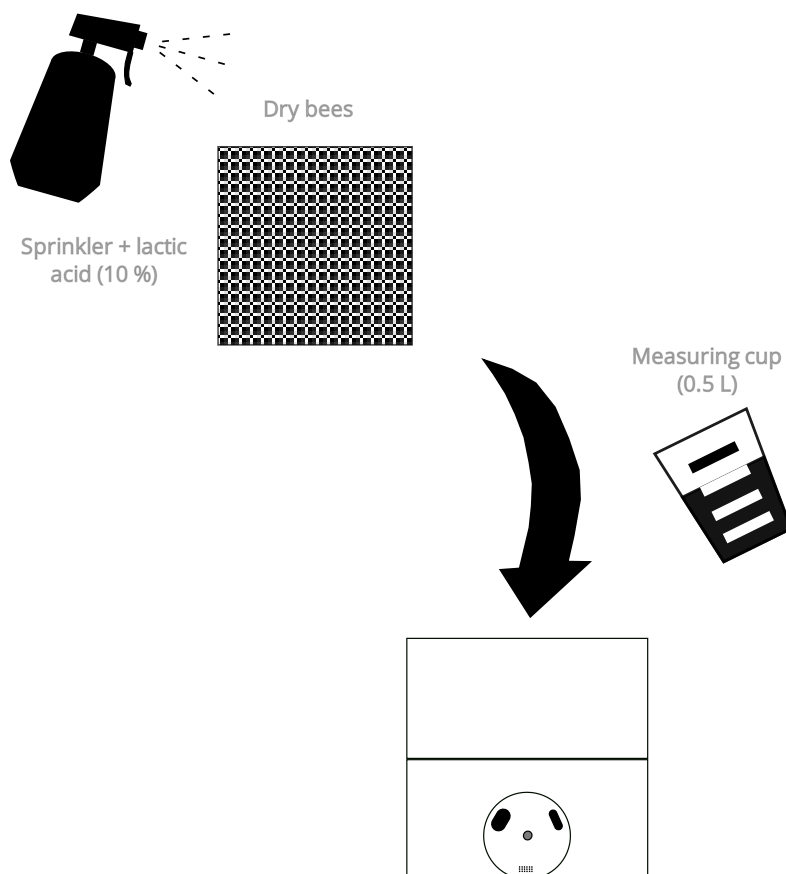


Step 3: Filling the box (optimum 2 persons)

1. Prepare assembled mating boxes in the line for easy and quick filling,
2. Take the container with dry bees and hit it several times on the ground to gather bees on the bottom.
3. Use the sprinkler lavishly to moisten all the bees.
4. Distribute bees evenly between mating boxes with the measuring cup (1 person).

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5. The second person places the PVC covers and lids on the mating boxes and occasionally sprays the container with bees to prevent them crawling out.



Step 4: Prepare nuc for the field

1. Transfer filled nucs into cold and dark storage to allow worker bees to form a nucleus colony around the queen and to release the queen - practical solution is a dark cold cellar for a minimum of two nights.
2. On the third night, transfer the newly formed nucs to the location, making sure to open them in the darkness.

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Step 5. Verify the nuc

1. On the fifth day five after nuc preparation, check the formation of the nucleus by lifting the super together with the lid. The drones are contained within.
2. If drones within the super are dead, you are safe to open the super and reuse the lid and PVC cover directly on the base mating box. If drones are still alive, wait for a week. No rush.

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