PennState Extension

Honey Bee Insemination: Pre-laying II Queen Introduction

Instructions for successfully introducing an instrumentally inseminated honey bee queen into a colony before she has started laying eggs.

Procedure

Instrumentally inseminated (II) queens require careful management to become established in colonies. II queens typically take several days longer to begin laying eggs than naturally mated queens, so their introduction should be carefully controlled. The following process will help improve success during the introduction. *Note:* Some beekeepers report higher success rates by keeping II queens in a queen bank for several days after insemination before installing them in nucleus colonies.

Instrumentally inseminated queen. Image Credit Kate Anton

Preparation of a small nucleus colony:

1. Set up a 4 or 5-frame nucleus (nuc) colony or single deep (preferably with a robbing screen).

2. Cover the entrance with queen excluder material (Figure 1).

Figure 1. Place queen excluder material over the entrance of the nuc (left) and an optional robbing screen as needed (right). Image credit: Kate Anton

3. Seal any other entrances or cracks in the hive.

4. Add 1-2 frames of mostly capped brood; at least one of the frames must contain emerging brood. Add 1-2 frames of honey and pollen, and enough young bees to cover 2-3 frames. Make sure there are enough bees to cover the brood. A feeder may be added and pollen substitute may be provided as needed. ** Only use bees and brood from healthy queenright colonies.

5. Ideally no eggs or young larvae are present in the nuc, though this is challenging to achieve as eggs are often present on frames with emerging brood (see Helpful Tips below)

6. Thoroughly inspect each frame and remove any queen cells. It is normal for the workers to produce queen cells when a queen is caged.

7. Optionally, the queen may be placed in her mailing cage in the nuc for 1-3 days before placing her in the push-in cage.

8. Place the queen in the push-in cage with emerging bees and food (Figure 2).

Figure 2. A queen being released from her queen cage into a push-in cage. Image credit: Kate Anton

9. Continue to inspect the nuc and remove queen cells every 3-5 days until the queen begins laying in the comb under the push-in cage.

10. The queen can be released from the push-in cage 2-5 days after she starts laying eggs if the nuc temperament is calm and accepting (Figure 3).

Figure 3. A queen after release from the push-in cage. Photo credit Kate Anton.

11. If the workers are runny and aggressive, do not release the queen - inspect the frames and make sure there are no queen cells (destroy any that are present) and return in another 2-4 days and test the temperament again.

12. If the temperament of the colony does not improve, try moving the nuc to a new location and add emerging brood.

13. After the queen begins to lay, continue to inspect the colony for supersedure cells (destroy them) every 7-10 days until a full brood cycle has been observed. If the colony is to be evaluated for performance or trait expression, it is necessary to wait at least seven weeks before evaluation to ensure you are evaluating the offspring of the new queen.

Helpful tips

- Only use bees and brood from healthy queenright colonies.
- 7-10 days before receiving your II queen, move several frames of brood above an excluder on a queenright colony (keeping the queen below the excluder). 3-4 brood frames for each II queen you wish to install is a good rule of thumb that will give you flexibility and extra bees in case they are needed. This time frame (7 days) allows eggs to hatch, larvae to age out of queen potential, and any queen cells that are made are easily identified and removed.
- Smaller colonies with many young bees tend to accept queens more readily than larger ones or ones with older workers. Make sure the population of workers is mostly comprised of young bees. Additional frames of emerging brood can be added to bolster the population after the queen is established. Shaking nurse bees from other colonies can increase the population to maintain enough bees to cover the brood.

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number LNE22-447.

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