

Queen Rearing Simplified

By Jeroen Vorstman, Holland

If you have been put off queen rearing because you do not have special mating nucs, or you find the whole operation a bit fiddly, then Jeroen Vorstman may be able to change your mind with his simple and efficient method.

There is a lot of misunderstanding about queen rearing. Most beekeepers find it difficult, or impossible to combine with their normal beekeeping practice. Some queen breeders advocate separating queen rearing operations from honey production colonies. But there is a way to integrate queen rearing in your normal beekeeping practice. I will tell you how I do it in five steps.

My method is based on your standard hive; there is no use of special mating nucs like Apideas or Mini Plus hives. This has a number advantages, including:

- You use the same frame size as your standard hives.
- There is no need for special hives (saves money and time).
- It is easier and safer to introduce a queen once she has mated by uniting than introducing her using an introduction cage.
- More bees means better queens.
- On standard frames it is easier to tell if a queen is of good quality.

Perhaps I need to explain the last advantage. If you let your queens mate in an Apidea mating nucleus for example, how can you tell if a queen is good or not? An Apidea, like most mating nuclei, has only three small frames to lay on. Even a bad queen is capable of filling these small combs with eggs, like a good queen does. I cannot tell the difference! Can you?

Another disadvantage of using small mating nucs is their size; a tiny colony struggles to stay alive. It is recommended to fill one coffee cup with young bees and put these in an Apidea. You therefore have to let one coffee cup with unexperienced young bees care for a virgin queen. You have to watch over the nuc almost every day. They are too small to gather their own food, so you have to feed them constantly with sugar patties. That is not the best food for a bee nor a queen. They are vulnerable to robbery and wasp attack. If the colony

grows, the space is too small for expansion. How can you expect such a small colony to produce a good queen?

I rejected all small mating nuclei on my bee farm and rear my queens on standard frames only. Since then, the losses during the mating period completely vanished! Still, I hear a lot of beekeepers complaining every year about their queen losses. They blame the weather or the birds, but never their fancy mini nucs! Therefore, I would like to advise you to rear your queens on your full-size standard frames and see it for yourself. It does not matter if you are using National, Commercial or Dadant. My way of queen rearing accepts all these frame sizes.

What is queen rearing about?

Queen rearing is all about breeding the best quality queens, which are physically perfect and have the characteristics you like. The most important characteristics I would like to see in my colonies are gentleness and varroa resistance. Low tendency for swarming and honey crop comes third and fourth. Every year I use young queens to restock production colonies, to expand the number of my colonies. I believe queen rearing is the key to successful beekeeping!

Breeder colony

The mother colony should have good characteristics. If you have a colony that excels in honey crop, low swarm tendency or any other trait you like, then breed from that colony. This colony we call the breeder colony. If you do not have the right breeder colony then ask another beekeeper or buy larvae from a queen breeder. These larvae are fated to become queens.

Starter-finisher colony

To produce good quality queens these larvae need the best care in a colony with lots and lots of nurse bees. This colony we call the starter-finisher, because in this colony the bees start and finish queen cell building. It happens all in the same hive.



Each year young breeder queens with good characteristics, such as this one, can be used to restock production colonies.

All photos by Jeroen Vorstman.

When the apple trees are flowering, at the beginning of May, you make a starter-finisher colony. Therefore, you will need frames with brood and bees from the production hives. **When you take one to two frames from each hive you will not notice any decline in honey production, but it will reduce their will to swarm effectively.**

Breeding calendar

When you want to breed queens you have to stick to a timetable; the 'breeding calendar'. The day of grafting one-day-old larvae is 'day 0'. Days with a '-' (minus sign) are days of preparation before you start breeding. Days that start with a '+' (plus sign) are the days after grafting. This is how the schedule looks:

- Day -7/-9 Make a starter-finisher colony.
- Day 0 Start of queen rearing: grafting.
- Day +10 Caging ripe queen cells.
- Day +12 Making nucleus.
- Day +30 Young queens are laying eggs!

Enough theory for now; it is time to look at the five steps to successfully breed good quality queens!

Queen rearing in five steps

Step 1. Make a starter-finisher colony (day -7/-9)

On a warm day at the end of April, beginning of May, you start the preparations. Put together an empty beehive with a floor, one broodbox, two frames full of honey, cover board, roof, hive strap and eight to nine frames with drawn comb or foundation or a mixture of both. You will need these eight to nine spare frames to swap with the frames of brood and bees you take from the production hives. The two frames with honey will stay at each side in the starter-finisher colony. The entrance stays closed.

Open the first production hive and take one or two frames. Mainly with sealed worker brood and hang it, still with the bees, in the



Choose frames with mainly sealed worker brood.

empty hive you just put together. Be careful that the queen is not on the frames! If she is, put her back in her hive. Put the frames in the production hive back together, fill the space with the spare frames and close the hive.

Do the same with three to eight production colonies until the starter-finisher hive is full with frames. When you are ready, close the hive and take it somewhere out of the range of the donor hives; about three miles away. Open the entrance and leave this hive alone for seven to nine days. This new colony is queenless and will start emergency cells. Although you took frames with mainly sealed worker brood, there should be enough young larvae for the bees to start emergency cells on.

Step 2: Grafting (day 0)

Seven to nine days after you made the starter-finisher colony you have to destroy all emergency cells in it. And I mean ALL of them.



This is an example of a good frame to make a cell starter-finisher.

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Shake the bees from the frames to find the emergency cells.

The best way for you not to overlook a single one, is to clear the frames of bees. So, shake the bees from the frames so you have a clear view of each frame. If there is even one emergency cell left queen breeding will fail.

Remove one frame in the middle to make room for the frame with selected larvae. Put the frame you removed in another colony. Now it is time to collect young larvae from your breeder colony.

Tip: Make sure to graft larvae not older than one day. Therefore, four days before grafting, put a frame with empty comb in the middle of the brood nest of the breeder colony. The queen will soon start laying eggs in the empty cells and three days later the eggs hatch. One day after they have hatched they are the right age for grafting.



Top: A cell cup with a one-day-old larva in it; Grafted worker larvae will become queens with the right care.

Bottom: Nurse bees feed developing queen larvae in a cell-builder.

Graft twenty to thirty larvae from your best colony and put the frame with the cell cups and young larvae in the middle of the starter-finisher. Close the hive and leave it for ten days.

Step 3: Cage ripe queen cells (day +10)

Ten days after you hung the frame with young larvae in the starter-finisher colony the queen cells are ready to be caged. Put five young nurse bees in every cage to care for the queen as she emerges.

Step 4: Making a mating nucleus (day +12)

Two days after you caged the queen cells, the queens emerge. Put together as many mating nuclei as there are queens. In every nucleus, hang one frame with bees from the starter-finisher colony, one frame filled with honey and the rest should be frames with foundation. Every nucleus gets a virgin queen. **Is she run in or introduced in an introduction cage?** Place the nuclei out of the range of the starter-finisher colony. Leave the nuclei for about two weeks. Be careful not to disturb them.

If you need more frames than there are in




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Young, unmarked virgin queen on a frame of foundation in a nucleus.

the starter-finisher, take frames with sealed worker brood from strong production hives. Let the old bees fly off. If you do not let the old bees fly off, this increases the chances of the young queen being killed. Put this frame, together with a frame of honey into the nucleus and fill the rest of the nucleus with frames with foundation. Leave the hive for one or two hours. After that the bees are aware that they are queenless and are more willing to accept a young virgin queen. Introduce the cage with the queen and her attendants.

Step 5: Inspect the mating nucs (day +30)

Two weeks after you made the mating nucleus, most young queens will be laying eggs. Nucleus colonies without brood have to be checked again one week later. If there is still no brood, they are lost. Shake the bees from the frames and take the nucleus away. Nucleus colonies with brood have to be fed, so feed them as long as they are working on the foundation. Give them room as soon as



Give every nucleus a frame full of honey; a super, such as this, filled with capped honey stores is perfect for a nuc.

becomes necessary. When summer comes to an end, the nucleus should have grown to at least a full broodbox.

If you want you can requeen an old or bad queen with a young one you reared very easily. Just remove the old queen, put a sheet of newspaper with a queen excluder on top. The excluder will prevent the newspaper from blowing away. On the excluder you put the broodbox of the colony with the young queen. Close the hive and leave it for a week or two. After two weeks you remove the queen excluder and the newspaper (if there is any left).

If you use five or six frame nucleus colonies for queen rearing, simply put an empty broodbox on the queen excluder and hang the frames with the young queen in it. After two weeks you have to rearrange the frames to form one broodnest. Requeening by uniting is the safest way to introduce a young queen in another colony.

I hope you will try my way of breeding queens. It is fun to do and young queens of premium quality is the basis of successful beekeeping. Good luck!

Editor's note: This article is based on a talk that Jeroem gave at the BIBBA Conference in September 2016.

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