



Raising Queens

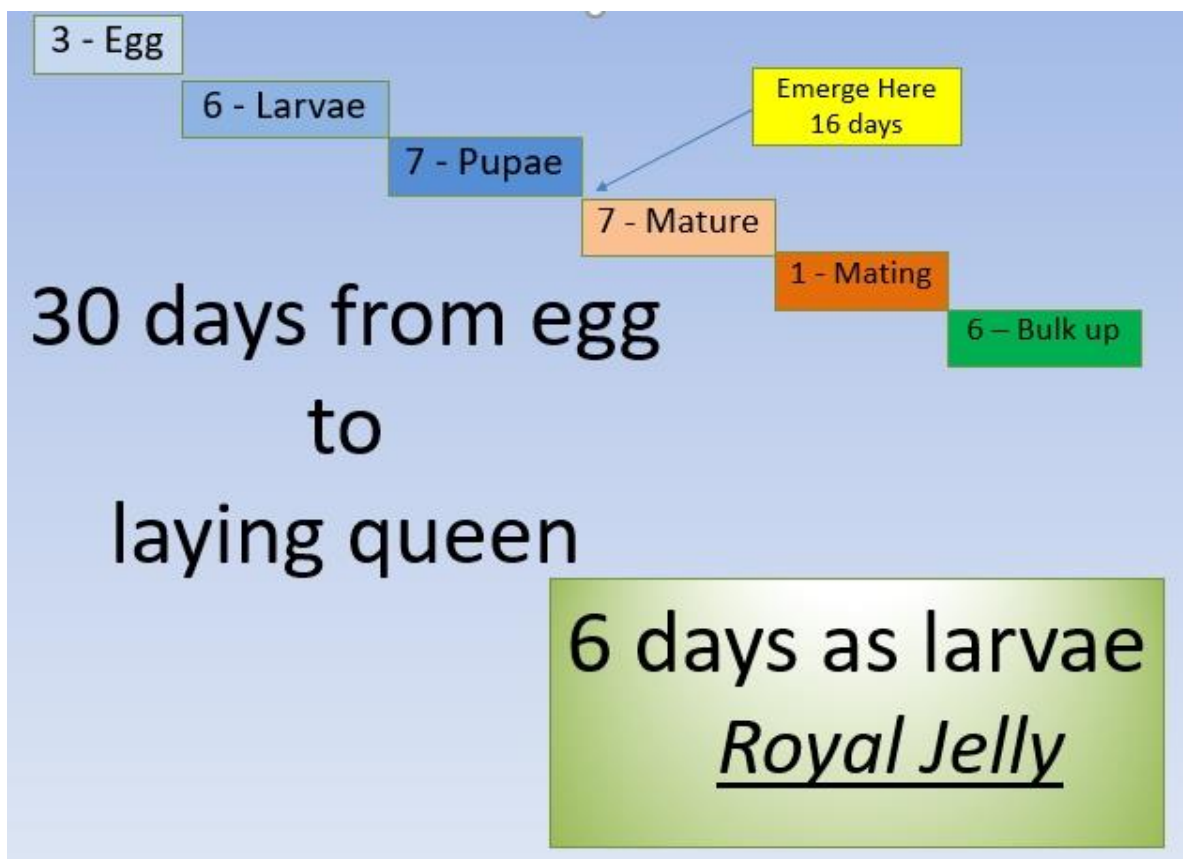
Raising Queens

Now is the time to consider raising queens. You have tried most things and have excelled or not. But, if you haven't tried raising queens, you are missing out on a part of beekeeping that is a unique experience. I will provide some of the basic information about queen rearing.

First a quick overview of the stages of a queen development and then I'll pass on some methods I have tried. (some failed miserably) Please remember that there is usually more than one way of doing anything in beekeeping. This recitation is just my personal experiences.



Let's start with the basics of queen development.





Note: The time frames presented are approximations. Slight differences can arise depending on temperature and other factors.

Egg – Days one to three

There is no difference during the egg portion of a queen or a worker bee.

Larva – Days four to nine

After an egg hatches, the larva is fed royal jelly for the first three days. If the hive has decided to raise a queen, the larva will be continually feed royal jelly (not bee bread) for the next three days. Because of this royal jelly feeding, the larva will grow bigger than a standard worker bee larva. This extra growth requires that the cell be expanded to accommodate the larva. The larva molts five times during these six days. Each molt is called an instar.



Pupa – Days ten to sixteen

After seven days, the queen cell is then capped, and the larva develops into a pupa. At the end of seven days the pupa chews its way out of the queen cell and emerges (not hatches) as an adult bee.

Note: You can usually tell from the queen cell as to the initial fate of a queen. If the cell was opened at the bottom, then it was a normal queen emergence. If there is a hole chewed in the side of the queen cell, then another queen killed the pupa in that cell.

Maturation – Days seventeen to twenty-three

When the adult queen bee emerges, she is more like a teeny bopper. Not quite ready to mate but definitely bigger and more adventuresome. This is evidenced by her need to eliminate (killing) any of her sisters. The term for this is sororicide. During this time the queen pheromone increases, and she may take some orientation flights.

Mating – Days twenty-four to twenty-five

On a nice warm sunny day, the queen then takes her mating flights. Depending on the situation the mating flights may last another day or so. During these flight(s) she seeks out a drone congregation area (DCA) and will mate ten to twenty times. The average number of times she mates given to me was 14.2 times. The sperm is stored in an organ called a spermatheca.

Bulking Up – Days twenty-six to thirty

It takes another four to seven days for the newly mated queen to bulk up and begin laying eggs. Egg production begins slowly and can eventually reach close to two thousand eggs a day.



Methods

I have tried the following methods for raising queens.

Split Hives

This is probably the easiest method for raising a queen. It relies on the fact that if young worker larvae are available, a queen-less hive will build queen cells and raise a queen. To accomplish this, you separate a hive in to two hives. It is a very popular method with overwintered hives that have a huge population of bees early in the spring. There are a couple of things that you should consider in order to accomplish this task successfully.

- 1) The new hive (the one without a queen) must have young larvae available.
- 2) If you cannot locate the queen, you need to ensure that each of the hives has young larvae available to produce a new queen.
- 3) Each hive must have an adequate number of nurse bees to support the creation of a new queen.
- 4) Forager bees will probably return to the original hive position after their foraging flight. Therefore, more worker bees should be moved to the hive that will be placed in the new location.
- 5) You must be patient. It takes about thirty days to produce a laying queen from scratch.



If you have a queen cell started or even capped, you can use this to your advantage by using it in the hive that doesn't have the queen. Again, if you can't find the queen then you must make sure that each hive has young larvae for queen production. If you happen to have queen cells on two or more frames, then your decision becomes easier. Just put a frame with a queen cell in each of the split hives.

Caution:

Many beekeepers like to "PINCH" queen cells. The reason given is to reduce the swarming of a hive and keep the bees in the hive to make honey. You must be careful doing this. If the hive has swarmed and you did not know it and you kill any prospective queens, you may have killed the hive. There may not be any larvae young enough to produce another queen.



Steal Queen Cells or Larvae and Make a Nuc

This is probably the second easiest method for raising multiple queens. Just like splitting hives, this method makes use of having young larvae or queen cells available. The difference is that one ten frame hive could have enough larvae and worker bees to support multiple five frame nucs. The operation for selecting frames is the same. Additionally, multiple donor hives can be used to bolster the number of nurse bees. Additional frames of nurse bees, pollen and honey could be gathered from any hive in your bee yard.



Grafting – Force Queen Cells

This method can produce a large volume of queens. You need to be ready to support the additional queens when they are ready to emerge from their cells. With this method young (less than three days old) larvae are transferred to individual cell cups. Then the cups are placed in a special frame and the frame is placed in a strong queen-less hive with a lot of nurse bees. After the cells are capped, they are then transferred to a mating nuc.



For commercial purposes, the grafted cells can be placed in a special starter unit called a swarm box that has been over-populated with nurse bees. This can produce huge numbers of quality queens. After the cells are started, usually twenty-four to thirty-six hours, they are transferred to a strong cell builder hive for finishing. After they are capped, they are moved to a mating nuc for breeding.



The standard five frame mating nuc consist of a frame of larvae or two, a frame of pollen and honey and an empty frame of drawn comb.

A two-frame mating nuc can also be used. It is a five-frame nuc that has been split with a follower board down the middle. It only uses a frame of larvae and a frame of honey and/or pollen. It also takes up considerably less room.





Note: Good eyesight is required for grafting. My grandson and granddaughter were extremely helpful.

Note: See “Swarm Box” in this publication for a version of this unit.

Note: See “Split Five Frame Mating Nucleus” in “Bee Equipment Essentials” on page 60 for instructions to build this unit.

Note: I heartily recommend a queen rearing class such as the one at the University of Minnesota in St. Paul Mn. See the following WEB address for information.

<https://www.beelab.umn.edu/bee-squad/education/beekeeping-lasses/queen-rearing>

Hopkins – Lots of Queen cells

Developed by a Mr. I. Hopkins in the early 1900’s, this method relies on the phenomena that when a bee cell is positioned vertically or has the bottom edge of the cell removed. The hive will usually produce a queen cell when a young worker larva is present in the cell.

Method

- This system is the placement of a frame with eggs and young larvae from a breeder colony above a queen-less colony. The frame is laid on its side and positioned horizontally above the brood nest.
- The queen-less colony will feed the cells on the horizontal frame and create queen cells from them.
- The trick is to provide eggs and larvae of the correct age so quality queens will be reared.



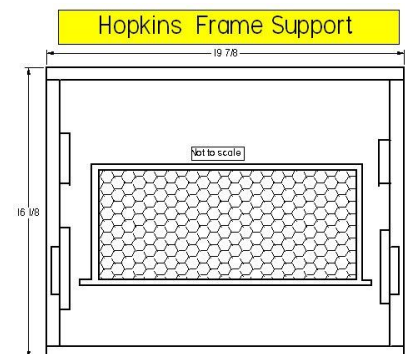
This method works fantastically.

First, I built a horizontal frame support that is described in “Bee Equipment Essentials” on page 68. I then placed the frame support and a brood frame above a very strong queen-less hive. Within four days, some queen cells were built, they were in different stages of development and it looked as if even more were being started.





This is where the first indications of a problem started to appear. Some of the cells were adjacent to each other and there were many more queen cells being built than I imagined would ever have. What was I going to do with all these queens? Then I realized that of all these cells only one queen would survive. Remember sororicide! I had a brilliant idea at this point. I would cut individual queen cells from the frame and install them in their own nukes. **WRONG!** The foundation that the frame used was a thick plastic and I was unable to cut the cells from it without making a mess of the cells and the frame. Recovering nicely from this problem, I did what I normally tell all beekeepers to do if they are completely befuddled. DO NOTHING. So, I left the horizontal frame on the hive and it eventually developed into a very strong hive.



Suggestion: I believe this would be a very easy way to raise a lot of queens provided that the foundation used was pure wax and not plastic. The capped queen cells could then be cut out and placed in a cell protector (Mann Lake #700) and moved to a mating nuc. Daily inspection of the frame would be needed to extract the capped cells before a new queen emerged and committed sororicide.

Cloake System – How to make a queen-less hive

This device is used to provide both a queen-rite and a queen-less colony from a single colony.

The Cloake System was developed by Harry Cloake in the 1970's. It consists of a divider board and a queen excluder that is installed between two brood boxes. The divider board is either installed (slid in) to change a single colony into two colonies or removed to change two colonies into a single colony. The first (bottom) colony is a queen-rite colony which is used to provide eggs and larvae. The second colony, which is queen-less is used as a cell builder colony. Many explanations on how to use this system can be found on the internet by searching for the keyword "Cloake Board".



An excellent description of this method is available on the internet at:

<https://honeybeesuite.com/using-the-cloake-board-method-to-raise-queens/>

The Cloake Board should be a viable alternative for small beekeepers who want to raise queens but can't afford to dedicate one colony as a cell builder.



The NUC

The nuc is an integral part of many queen raising methods. Here is a general makeup of a common nuc.

- Frame of pollen and honey – Keep the bees from starving
- Frame of bees (2)
 - Nurse
 - Capped brood (queen Cells)
 - Larvae
 - Eggs
- Frame of pollen and honey – Keep the bees from starving
- Empty drawn frame – Give the new bees something to do and allow them to expand.



Suggestion: An addition to the standard nuc that I use is a bottomless nuc. This box is added as a second box to a standard nuc and allows me to provide additional space for the bees to expand. When populated you have a full eight to ten frames of bees that can be moved into a standard ten frame hive.

Swarm Box

The Swarm Box is a pseudo starter hive that has an unbelievable number of bees for the space provided. It is used when you need to raise a lot of robust queens. The over population of nurse bees ensure that the larvae have a more than adequate supply of royal jelly for their development. Because of the huge number of adult support bees, the heat from the box can become excessive. Hence the need for the screened sides and bottom.



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Usage After the larvae are grafted, the grafting frame is placed in the center of the swarm box. It is surrounded by a lot of honey and pollen for the nurse bees to use. A wet sponge is placed on the bottom in a saucer to provide plenty of moisture. Drawn empty frames are added to the outside positions. These extra empty frames provide space for the extra bees to occupy and at the same time can keep them busy. After the grafting frames is added a huge number of bees are added from a queenless hive. The box is then placed in a cool dark area for twenty-four to thirty-six hours. At that time the grafting frame with the started queen cells is placed in a cell builder hive and the adult bees are returned to their hive.



Conclusion

Easy and fun, producing queens is enjoyable and possibly even profitable.

Get a copy of Ed Simon's book *Bee Equipment Essentials* with detailed drawings, construction hints and how-to-use instructions for dozens of beekeeping tools and equipment from www.wicwas.com. Ed can be contacted through SimonEdwin41@gmail.com.