

New Westminster Beekeeper's Association
19 Things to Know about Beekeeping
Module 7 – Queen Rearing

This module was prepared for members of the New Westminster Beekeeper's Association and are intended to be augmented by hands-on experience in the bee yard.

Rearing queen honeybees is fun and highly rewarding!

The Queen

The queen is an egg-layer. The female workers are the boss and determine which tasks are to be done.

When the queen is newly born, she mates in the air over a three-day period with up to 15 drones. The drone dies immediately after copulation. The queen stores a bit of each drone's sperm in an organ in her body called a spermatheca. She never mates again and can lay up to 3 million eggs in her lifetime. A queen bee will live up to four years.



Queen Bee Mating



Spermatheca Organ

When a queen lays an egg, she can fertilize it by passing a bit of drone sperm over the egg as it is being laid. A fertilized egg develops into a female bee. If the queen does not fertilize the egg, the egg develops into a male bee.



When Do Worker Bees Make a New Queen

Worker bees will make a new queen when,

1. The old queen has died- Called ***Emergency*** Queen Rearing
2. The old queen is not laying properly – Called ***Supercedure*** Queen Rearing
3. The workers want to divide the colony into two – Called ***Swarming***.

In the case of Emergency queen rearing or Supercedure, workers will choose about six female larvae of the correct age (less than 24 hours old) and feed them copious amounts of royal jelly over the 5-day life of a larva. The diet change is sufficient to change the physiology of the bee to develop into a queen, rather than a worker. A worker lives only 45 days.



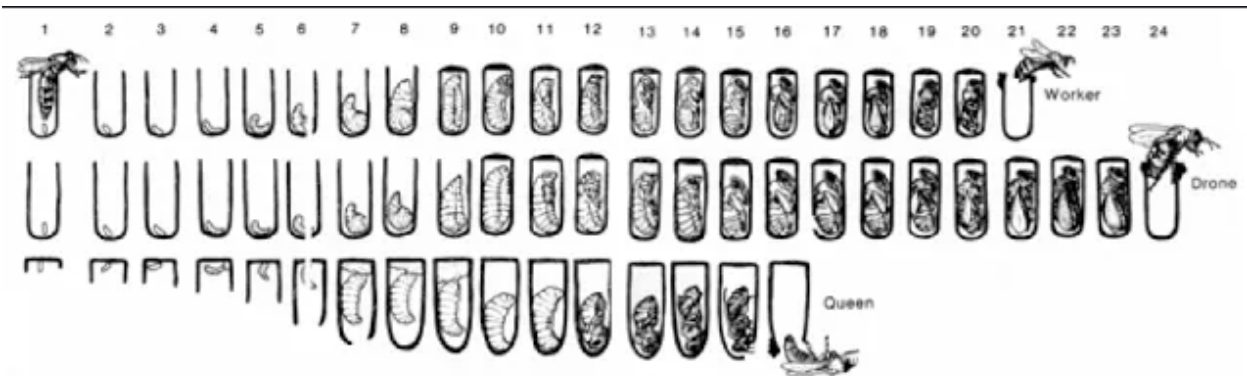
Typical Supercedure or Emergency Cell on the Face of a Brood Frame



Figure 1 Typical Swarm Cells at the Bottom of a Brood Frame

How Long Does It Take to Make a Queen?

The length of each stage in the life of a queen bee:



Queen bee egg to larva is 16 days:

Egg Stage = 3 Days

Larva Stage = < 5 Days

Pupa Stage = > 8 Days

Thus, if the workers start a new queen from a 1-day old larvae, it will be born < **12 days later** – which is why we check our bees once every 10 days during the spring season.



Queen Bee Hatching

Queen Rearing Methods

There are several ways a beekeeper can rear new queens mimicking worker bee behaviour:

1. Emergency Queen
 - a. Remove one frame of brood that has all stages (egg, larvae, pupae) with adult bees attached,
 - b. Place it in a nuc box with one frame of honey and pollen with adult bees attached,
 - c. Shake one or two frames of nurse bees into the box,
 - d. Feed pollen patty and syrup,
 - e. Move it 3 km away,
 - f. In <12 days, a queen will be born,
 - g. 10 days later, she will be laying,
 - h. Make this in May and the colony will grow to a full box of bees by August with a sufficient population to go into winter for next-year's honey production.



Eggs and Young Larva

2. Swarm Cell
 - a. As above but use a brood frame with a swarm cell attached.
3. Grafting Method
 - a. Graft 20-hour old larva into special queen cups on a special frame
 - b. Place into a colony with a huge nurse bee population, no brood, and no queen
 - c. The colony will turn all grafts into queens
 - d. Transfer the queen cells to mating nucs just before they hatch
 - e. Each mating nuc will produce a laying queen two weeks later



Queen Rearing Spring Loaded Grafting Tool



Grafting 20-Hour Old Female Larvae into Queen Cups



Queen Cells from Grafts



Mating Nucs

Mating nucs are started exactly like raising emergency queens,

1. One frame brood in all stages
2. One frame honey and pollen
3. Shake of nurse bees
4. Pollen Patty
5. Sugar Syrup

When the newly mated queen lays in the mating nuc, she replenishes the nurse bee population

A mating nuc will produce one new queen every 20 days, or 6 queens per year (May to August).



Queen Rearing Yard - Drone Mother Colonies in Centre of the Yard

End.