

Stahlman Beekeeping Notes for 2022

Queen Cells:



Issue # 15 April, 2022

Every beekeeper doing a hive inspection should understand the functions of queen cells.



Queen cells look somewhat like peanuts.

Queen cells are built by the bees for three reasons:

- As emergency queen cells. Nature has endowed the colony to save itself by being able to feed a young worker larvae to become a queen. Thus, the cell is the base of a worker cell having a larvae in it. Often a colony will build a number of cells – 10 or more.
- As swarm cells. These cells will be numerous (maybe 20 or more). They will be located along the bottom or at the edge of brood comb.
- As supersedure cells – these are built generally from a base called a queen cell cup. This cup is located in the center of comb (not at the bottom). Often only two or three cells can be found. This differs from emergency cells and swarm cells because the colony will build a number those cells but only a few supersedure cells.

Supersedure Cells:



This is a frame from a newly started package of bees. The queen was present in the hive and the bees were busy drawing wax foundation.

The next picture is going to be an enlargement from the center of this frame. Notice that cells have not yet been capped (honey or brood).

The blue arrow points to a queen cell cup. I have enlarged the area around the queen cell cup in this photo.



This is the beginning of a queen cell being built near the center of the frame. This might be mistaken as a sign that the hive might be getting ready to swarm!

The cell is not being built over worker brood – that is an important distinction. When cells are built over worker brood, it usually indicates that the cells are emergency queen cells.

These bees are building a supersedure cell. They for some reason have decided to replace the queen that

came with the package of bees.

Supersedure is the replacement of the queen in a colony by the bees. Queens produce something called the “queen pheromone or queen substance”. For various reasons a queen may not be producing a level of pheromone substance acceptable to the worker bees. The worker bees solve this issue by building a few queen cell cups into which the current queen lays an egg. With newly introduced package hives, this event will result in delayed population growth and development.

A beekeeper recognizing this effort by bees to replace the queen face some choices:

- 1) Do nothing! Maybe the bees know best how to survive.
- 2) Cut the cells down! Thinking these are not important (confusing them with swarm cells), the beekeeper might just cause the colony to be set back considerably by interfering with what nature has provided to the bees – the instinct to survive.
- 3) Purchase a new replacement queen if the brood is spotty and the current queen seems to be doing a poor job. In that case the beekeeper must remove the old queen before introducing the new queen and cut down existing queen cells. I might add that before the new queen is released from her cage another check for new or any missed cells must be destroyed.
- 4) If many hives with introduced queens show this same thing, one might contact the queen producer to point out that the queens from that source are prone to being superseded. It might result from a batch of poor queens produced. There are a number of important steps in raising good queens. Lack of proper food and the amount of royal jelly fed to queen larva, chilled for the lack of warmth in cell builder hives or when introduced to mating nucs, poor breeding stock – a number of things come to mind regarding the quality of queens being raised. Any of them could result in an accepted queen being rejected because of reduced queen substance.

Supersedure often happens later in the season and the beekeeper is often unaware that it is happening. Poorly mated queens usually fail by August or September. Often the old queen and her daughter queen can be found (for a short period) in the same hive. Both laying eggs. Two queens found in a hive at the same time could indicate one is being superseded. (Replaced)

Most indications are that the old queen just disappears in time. I did not find one single resource to indicate that bees ball and kill the old queen. It is more likely bees switch from feeding the old queen to taking greater care of the new mated queen sharing more queen substance. This is behavior clearly recognized when bees decide that drones are no longer needed.

I am going to share a few photos to point out differences in queen cells.



This first photo indicates the possibility that this is a supersedure queen cell. It is well formed, not surrounded by brood. If this queen cell was the same age as other eggs laid at the same time, we would be seeing large larva and capped worker cells in the area.

This is a healthy colony with both drones and worker bees in the bee population.



If eggs are found in the hive, it would indicate that a queen is still present.

This frame contains a solid brood pattern. Note that cells contain capped brood in the center of the frame and larva is seen surrounding the capped brood.

Outside the larva cells are eggs. When brood emerges, a queen revisits open cells to lay more eggs.

A frame like this can produce 3000 new bees on just one side in 21 days. This adds to bee population in the hive. A good queen can lay from 1500 to 2500 eggs in a single day. Those are the kind of queens we as beekeepers strive for!

Emergency queen cells:



Emergency queen cells



Supersedure cell



It is important for beekeepers to be able to read a frame during an inspection.

The queen cells shown in the photo on the left are emergency queen cells. Note that they are built over worker cells that contained larva. The queen cell larvae and the surrounding larva will all be about the same age. Also note that the base of the cell is built above and around a worker cell. There is no base other than the floor of the worker cell.

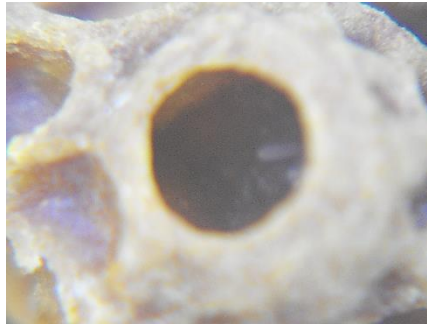
Using the knowledge of queen development, we can estimate very easily the age of the queen development in these cells.

Queen cells are fully capped over on day 9 and queens emerge from the cell on day 16.

In both cases (Supersedure and Emergency queen replacement) the cells are attached to the face of the comb. Usually in the area where brood is raised.

Swarm Cells:

Early development of swarm cells:



A hive about to swarm will build a large number of queen cells.

They will look like peanuts as well.

The base of these cells are built near the bottom of the brood nest or near the outside of the brood nest.

This is an important distinction. When checking a colony of bees, it is common to look at the bottom bars of a hive body. If the bees are starting queen cells along the bottom bar, they will be easy to see. If you see eggs in the queen cell cups, the hive is preparing to swarm.



If you see larva as seen here, it will not be long for the hive to swarm. Cells this size would indicate the hive is within 10 days of producing a virgin queen bee. Just remember that swarming occurs before queen cells mature. Bee behavior leading to swarming involves a number of recognizable factors – queen egg laying begins to be reduced likely a week before

a swarm happens, scout bees search for a nesting site, nest temperatures rise, and of course the colony has raised a large number of drones and begun building queen cells.

It is possible to examine a queen cell to determine more exactly the age of the developing virgin queen.



This is a young pupa of a developing queen bee. Note that it no longer looks like a worm (larva).

The three body parts have developed with a head, thorax, and abdomen.

An examination of the head shows color in the eyes. The eyes will darken over the last four days of the queen's development. Wings



develop on day 15 and if the queen cell is held before a light (called candling the cell) movement can be observed.

This virgin queen did not make it. Note that the eyes are dark in color and the wings are formed. Another queen stung her before she could chew her way out of the cell.



Many virgin queens are killed before they can emerge from their cell and the side of the cell will be cut down as shown here! Bees remove the dead queen from cells and carry them out of the hive.

A hive with queen cells cut down are an indication that the hive has a virgin queen and the colony has swarmed.

Only one of the many queens raised by the colony will survive.

This brings up an important issue in bee management. When will the new queen begin to lay eggs?

After a swarm leaves the hive it will be several weeks before the new queen will begin to lay eggs. Most experienced beekeepers will inspect the hive to check for eggs about that time. If eggs are present, the colony will have replaced the swarm queen. If no eggs, check the hive again a week later! It is at that time one must make the decision to introduce a new queen. If the hive is queenless and no action is taken by the beekeeper—the hive will eventually develop laying worker bees. See topic [Issue 14 Laying worker bees!](#)