



# STAHLMAN

## BEEKEEPING NOTES

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### This is swarming season in North Carolina (Coastal and Piedmont Regions)

I was informed by my Ohio friends that they had freezing temperatures and some snow this past week. Just wait, swarming time is coming in your direction.

Two great books to read about Swarming are “Honeybee Ecology” and “Honeybee Democracy” both by Thomas D. Seeley.

In “Honeybee Ecology”, Seeley discusses the annual cycle of colonies. Swarming is an annual cycle – it happens every year and accounts for bee survival as a species. Seeley reports “*The social organization found today in the genus Apis has a history of some 30 million years.*” Seeley charts out the “Domestication” of honeybees. He reports on research that “suggest that man’s methods for exploiting honeybees have developed repeatedly in a consistent pattern among the various peoples of the Old World.”

We may know more about the swarming (causes) than earlier generations but swarming is a natural response to reproduction. One thing reading HoneyBee Democracy caught my eye – Seeley points out the (adaptability) of the honeybee.

Quote: “**When in an unnatural environment it is the tendency of honeybee colonies in beekeepers’ hives to refrain from colony reproduction and instead stockpile several times as much honey as they need for winter survival.**”

In other words, we as beekeepers interfere with the nature of swarming. We look at swarming as bad. I don’t know how many books on swarming have been written, but it is a major issue that challenges beekeepers. It is no problem for honeybees living in the wild.

When I practice swarm prevention, I am actually forcing my bees to adapt to my desire to prevent them from doing the natural thing. I have found that the various methods used to prevent swarming often fail.

The development of queens, workers and drones is biology. There is nothing we can do to alter that aspect of beekeeping other than selecting breeding stock that may have a trait we like – something like breeding queens using artificial insemination.

In today’s world, we are the master – we force the honey bee to adapt to our methods whatever they may be. But the honey bee is still going to be guided by its natural instinct. Consider that for what it is worth!

Seeley points out that honey bee actions are remarkably orderly. It is not a haphazard event. The ancestral heritage may have quite a bit to do with swarming. He draws a comparison between European honey bees and Africanized honey bees. Page 148 of *Honeybee Ecology* he shares this: “African bees invest several times more heavily in survival and reproduction” than European bees.

In nature (not managed hives) there is a difference in the number of swarms produced annually by a colony.

Figures based on reports for the 1980's (This book was published in 1985) Bee swarms in a year

African bees 6-12 swarms (African bees are more prone to absconding from a hive)

European bees 2-3 swarms

We generally think of Africanized bees as being easy to detect because of their defensive behavior but swarming/absconding behavior is also a trait displayed by Africanized bees. In his book The Lives of Bees Seeley shares the story of the mix of subspecies of *Apis mellifera* in wild colonies living in the U.S.

A sample of bees DNA was taken from single bees in 64 colonies. The results taken in 2011 showed some surprising results. A small percentage (less than 1%) revealed genes from two African subspecies: *A.m. Scutellate* and *A.m yemeneica* living in the forest south of Ithaca, New York. This will likely continue to be the case with queens being produced in the southern border areas where Africanized bees can be found.

Our bees are highly hybridized. I am not an expert but I observe a number of things happening to our bees.

Some of the queens sold from areas near Africanized bee locations are showing aggressiveness. I mean real aggressive behavior. I have seen this aggressive behavior with nucs and packages with several of the students I have mentored over the last several years. I don't mean just nasty bees but real nasty bees.

I have also noticed beekeepers reporting that their bees just left their hives. Why?

The definition for absconding is: “Bees abandoning a hive because of wax moth, excessive heat or water, mites, lack of food, or other unfavorable conditions.” From the Glossary of “The Beekeeper’s Handbook 5<sup>th</sup> edition.

This is different than swarming. When bees abscond from a hive, they leave almost nothing behind except some brood.

From the Hive and Honey Bee published by Dadant & Sons 2018 ed. page 98, I found this: “European and African bees differ dramatically in their tendency to swarm. Both swarming and absconding involve the formation and movement of swarm clusters.”

Absconding is not a reproductive process and does not involve colony fission or the rearing of new queens. Quote from above book. “Absconding bees leave almost nothing behind. It is reported that they eat bee eggs and larvae and consume honey gathered prior to leaving the hive. Time and frequency of swarming and absconding are different. Swarming is usually an early spring event and may occur sometimes later if the hive is crowded.” Swarming hives (1) raise new virgin queens! And (2) A swarm leaves a population of bees in the hive they leave.

Absconding bees leave usually later in the season. I have had individuals say to me, “I checked my hive last week and now they are gone!” On checking I find no queen cells, maybe some dead capped brood, and no honey stores. This could also indicate a robbing situation with a weak hive. Putting an entrance reducer or

robbing screen on a hive will not stop a hive from absconding. An entrance reducer or robbing screen will protect a weak hive with bees and a queen that have no intention of leaving.

Beekeepers want an explanation for why the bees left. The signs for an absconding hive are as follows:

- Bees generally consume all the honey in the hive prior to leaving.
- Hive has a fairly large population of bees and may seem to be doing well but the bees leave.
- The queen reduces egg laying. (This also happens with bees about to swarm.)
- The colony may be stressed – a lot of noise near-by, street lights, even mites or other pests.
- It might be a sort of migratory movement to follow shifting nectar and pollen sources.
- It is considered a seasonal event for Africanized bees – they have the urge to move on!
- Brood is cantibolized,
- N sign of queen cells

A robbed hive will show these signs:

- The hive was weak prior to the no bee situation
- Dead bees in and around the hive
- Wax chips on the bottom board between frames
- Comb will have ragged edges and no honey
- Remaining bees generally drift to other hives

Information is available concerning African honey bees and traits they exhibit.

A google search will return a number of resources as well as information found in [The Hive and the Honey Bee](#) published by Dadant.

[A great deal of research has gone into swarming. Many beekeepers have published articles in bee journals about swarming – mostly in how to prevent it rather than studying causes. The leading research in the U.S. has been done by Roger Morse and Tom Seeley with research on bait hives and the communication among bees in determining where they go.](#)

Drones exist for one reason. No hive can continue the reproduction of a new generation of honey bees without drones. The sperm from drones fertilizes eggs to produce female bees. Both queens and worker bees can lay eggs. But an unfertilized egg will produce only drones. It takes two sex alleles (one from the queen and one from the drone) to fertilize an egg and determine its sex (female).

The first swarm produced by a colony of honey bees is called the “prime swarm.” The old queen and a large proportion of worker bees leave and seek a new nest location. This prime swarm may contain some young bees as well as some drones and many older bees.

After a swarm leaves, the surviving virgin queen takes a mating flight (several flights in fact) to mate with many drones – up to 20 according to research done on this. She then becomes the new laying queen in the colony/hive. All of this leaves the hive with a smaller population of bee and some brood. It is considered a set back by beekeepers wanting a honey crop. The colony/hive will have lost a large foraging population.

However the colony will recover with a new queen.

It will take a period of time before the new queen begins to lay eggs (about two weeks). This is an interruption in the brood cycle. There is an advantage to the bees – it reduces congestion in the hive and in the modern era of Varroa mites, it results in a period of time in which Varroa mites do not reproduce.

## Signs that honey bees are preparing to swarm:

- The appearance in early spring of drone cells along with frames of worker brood.
- As the brood nest becomes crowded, the queen finds fewer open cells to lay eggs.
- Research has indicated that queens produce less queen pheromone as they age. Crowding disrupts pheromone distribution among the bees.
- This combination of reduced space for egg laying and lower pheromone levels promote the building of queen cells. Normally the queen pheromone suppresses the bees ability to raise new queens.
- One other issue is that nurse bees usually fully employed feeding young larvae are unemployed in what is a natural task for them.



This is the result:

Bees begin to build queen cells. As shown here, they are found near the bottom bar of a frame.

Time line for the bees to swarm

Day 1 - eggs laid in queen cell cups

Day 8 - queen cells are capped and sealed

Day 12 – Swarms issue from the hive usually during a warm day around noon. Swarms may be delayed several days due to weather conditions. Swarms leave before virgin queens emerge from their cells.

Day 16 - 1<sup>st</sup> virgin queen emerges from her cell and the queen battles begin. Only one will survive!

## What a swarm does:

They fly from the hive to a short distance away. Usually the queen is still heavy and must reduce weight to fly further. Swarms are known to be found in the tops of trees but usually they settle where they can be captured easily – the place where the queen lands. If the queen for some reason is unable to leave the hive, the bees will swarm but return to the hive in short order. If a queens wing is clipped, it will prevent that queen from flying away with the swarm. But there will be plenty of virgin queens available to leave with a swarm. Hives with confined quarters may send out after-swarms called casts. These swarms will have virgin queens. I have seen many small swarms They all came from the same hive and each small swarm had a virgin queen. The swarms were small– about the size of a grapefruit or a bit less.

I highly recommend beekeepers read: HoneyBee Democracy by Tomas D. Seeley. It gives a good idea of how swarms find homes. The role of scout bees and how decisions are made by bees including a dance language.

Swarming season is going to last awhile – get into your bees and look for the signs of swarming. If you see swarm cells, you will be in the position of stopping or catching swarms if you can!

The decisions you make now are important for the rest of the bee season.

There was a question on my EAS Master exam that asked this question:

**Name two reasons why a swarm could present issues and problems if you hive them. Explain your reasoning.** The question did not say don't catch or hive them.

The answers expected were: 1) The queen will likely be old – one has no idea of her age and heritage. Replace her with known stock as soon as possible or make frequent inspections to determine her status as worth keeping.

2) The bees may be carrying a disease or mites. To avoid issues, install the swarm on new comb and inspect especially for AFB and disease. Swarms are well known for drawing new wax on foundation. Old comb would delay and mask some of the disease issues. This question was asked in 1995. Today I would add -- do a mite check immediately and treat for mites. The swarm would have no brood and thus, various treatments could be done that would not affect young brood or honey in the hive.

3) Today's beekeepers have an additional reason. Africanized bees. Swarms (even Africanized bees) tend to be gentle. They engorge themselves with honey. This fills the honey stomach making it hard for bees to move the abdomen into stinging position.