Seasonal Colony Survival Traits

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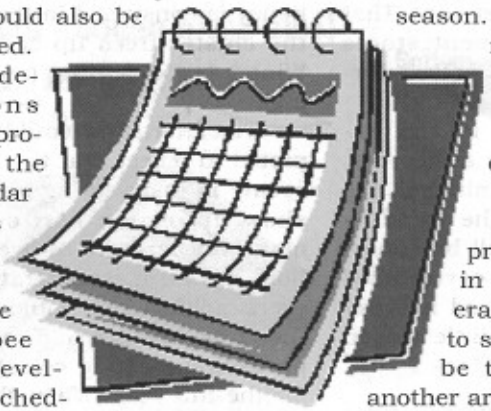
An effort was made in earlier articles to introduce you to the concepts of changing activities in the honey bee colony. Activities change with season advancement for the whole year. The example of simpler insect lifestyles was used to point out that activity changes are not unique to the honey bee. However, the complexities of the social insect lifestyle of the honey bee require more sophisticated changes in internal operations, and more of them.

The internal operations to be described herein are those seen on the Alabama/Tennessee state line, about the center of both states. The activities will be summarized for our calendar season. Further north, where the active season is compressed, the monthly entries would also be compressed.



The descriptions below are provided for the full calendar year. As noted in an earlier article, the honey bee colony development schedule is synchronized to the growing season of deciduous native trees. All the popular races of European bees react to the season advancement with very close timing. Variations between the Italian and Carniolan are minimal. The different races read season advancement within a few days of each other when compared colony to colony.

It should be noted that some of the year-long operational changes have been discussed in earlier articles to support other survival traits. They will be included in this list again to provide a January to January running list.

JANUARY Brood rearing. It appears that the Winter brood rearing is an operational part of wintering. The colony starts brood rearing to offset the cluster decline in size resulting from loss of last season's bees. The cluster volume does not typically show an increase until emergence of the second brood cycle in February.

FEBRUARY Start rearing, or make provision for rearing, large numbers of drones. The impending mating season dictates rearing of drones well before the swarming season. It takes substantially more time to get a mature drone on the wing for mating than the development time for a queen.

MARCH The swarm preparation season starts in March, locally. The operational changes related to swarm preparations will be treated separately in another article. For this year-long summary, it will be sufficient to note that March is the period of population "explosion" to support reproductive swarming by colony division.

APRIL Locally, the month of April is jam-packed with operational changes. It is the month of reproductive swarm issue. But since we intend to treat swarm operational changes separately, we will note changes of the colony that is not strong enough to swarm.

In the first week of April, concurrent with the beginning of hardwood leaf-out, the colony that has not started swarm queen cells abandons reproductive ambition. We refer to this change of objectives as the reproductive swarm cut-off. (Repro c/o)

The colony decision to abandon reproductive swarm ambition produces several indications of internal operational change. Some are more apparent to the beekeeper than others. All colonies do not exhibit all of the following indications, but all colonies will typically show two or more indications of change.

1. All established colonies start a slow-down in overhead nectar storage. Very little, if any, nectar is added in the supers in spite of woodland sources peaking during the period. The storage lull lasts about three weeks and ends with the appearance of white wax at the start of the main flow. The break in storage is the period between the literature's "early flow" and "main flow." The lull is an operational change effect internal to the colony, and has nothing to do with field nectar availability. Second year colonies that have retained establishment momentum over the Winter often display the opposite indication. They are suddenly storing a solid pattern in three empty supers at the same time.
2. Barring overcrowded conditions, any queens cells started after reproductive cut off will be supersedure queens. Some colonies will start supersedure promptly after the decision to abandon swarm ambition and others will start between that time and early in the main flow. Our judgment of swarm

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versus supersedure cells is as follows: Fewer than seven cells on any given level indicates supersedure; more than 10 represents swarm intent; between seven and 10 is seldom seen at this location.

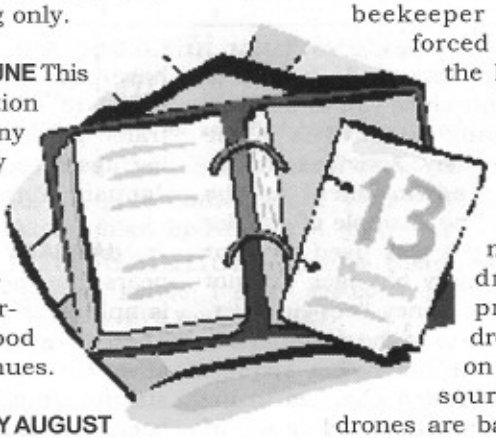
3. Some colonies generate some wax makers in the prime swarm prep period immediately prior to reproductive cut off, whether they have intent to swarm or not. With cancellation of swarm ambition, their wax will not be needed for building comb in a new location. With the operational change at reproductive cut off they need to graduate to foragers. They will deposit their wax holdings in the first few days after the decision is made. If the colony was feeding on darker Fall honey or early season darker nectar, when they tanked up for the wax making, the wax will not be white. The off-colored wax is most often stored in the brood nest as burr comb or bridging. A new wave of wax makers will be generated for the white wax "main flow."

4. The last indication to be described can be seen by the beekeeper rather easily if he knows when to look for it. The reserve of capped honey saved through the swarm season above or to the sides of the brood nest has served its purpose. After reproductive cut off, the colony is as eager to consume it as they were to protect it a few days earlier. They feed on the reserve even though field nectar is peaking. We conclude from the indications that they desire to recycle those cells with this season's fresh nectar. The capped honey reserve will be more fully described when swarm preparation operational changes are discussed.

About mid April, the colony that was expanding the brood nest to increase population for swarming changes direction. After a delay of a week or so from reproductive cut off, the colony starts brood nest size reduction. The brood nest size is reduced from that point through the main flow until it is down to the size that just produces replacement bees. Brood nest reduction is accomplished by displacing brood with nectar at the top, and pollen at the bottom.

In the last few days of April, the white wax "main flow" starts. There is no immediate gain in the supers. The early "main flow" incoming nectar and new wax are applied to brood nest reduction. The lull lasts for approximately three weeks, and is interesting from the standpoint of that period being a worker brood cycle. It is also interesting that black locust blooms during that period. In years when black locust is good here, there is no gain in the supers. The bees work it to support brood rearing only.

MAY AND EARLY JUNE This is the honey production period when the colony adds stored honey above the receding brood nest. They will fill supers at rates limited only by available work force and forage in the field. Brood nest reduction continues.



LATE JUNE – EARLY AUGUST At this location, with a split season, midsummer/native forage sources are erratic to nonexistent. The bees are operating in a stand-by mode. In this mode, the bulk of bees are fairly quiescent to conserve stores. They have met survival requirements on the "main flow." Most colonies are content to only forage for Winter stores maintenance. That is – they like supplement stores used for brood rearing and feed during the period.

We suspect that in the extended forest of their ancestors, where Fall forage was minimal, the colony would stay in the stand-by mode all the way to Fall broodnest closeout. Having their cavity filled with stores and the brood nest reduced, there would be little reason to do otherwise.

LATE AUGUST/SEPTEMBER When the sustained increase in field forage is perceived by the colony, an increase in brood volume is triggered. The colony keys on field forage. They build population to take advantage of forage availability. In this area, building population is a wintering advantage. There are more young bees for wintering.

OCTOBER Operational changes in the Fall are recognized in the literature. The colony closes out brood rearing for the year. The colony that gets it right has all the brood emerged in time to fill brood cells with nectar. If brood cells are vacated while field nectar is available, the whole cavity (hive) can be filled with Winter stores. In this area, most colonies are successful in this preparation of the Winter broodnest. In more northerly locations, where Winter descends more rapidly, the beekeeper may be forced to feed in the Fall.

The other operational change is the termination of drones. To prevent the drone burden on Winter resources, the drones are banished.

NOVEMBER-DECEMBER The early clustering period is dedicated to stores conservation. Without brood rearing, cluster temperatures are permitted to drift lower. The key feature of this period is overall reduced activity, resulting in less stores consumption. What little honey is consumed in the center of the cluster frees up cells for mid Winter brood rearing (and clustering).

The literature could be interpreted to reflect that the honey bee colony is just waiting for forage to show up on the horizon. If they make the mistake of over population, a swarm is generated. These oversimplifications couldn't be further from the truth. The colony is protecting existing colony survival for the full year. When the experts recognize the seasonal changes in colony internal operations, we can all see beekeeping from a different perspective. **BC**

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