Colony Spring Operation

It's all geared toward efficiency.

Walt Wright

In this segment of survival traits an ambitious agenda is planned. The operational changes prompted by season advancement and swarm preparation will be integrated for the Spring season. In this article, we take the next step and offer a hypothesis for the "whys" of what we see happening in the Spring season. It is not possible to look at a frame of bees and guess what each bee was doing before you opened the hive. The hypothesis presents conclusions drawn from the effects we do see.

In April a brief introduction was provided to the full season honey bee internal operations that support survival. In May condensed description of survival traits applied during swarm preparations were described. The survival considerations of the existing overwintered colony were described for both reproductive and overcrowding swarms. In this segment and future articles, discussion of overcrowding swarms will be discontinued for two reasons. It is assumed that the point has been made that overcrowding swarms are generated by beekeeper mismanagement, and secondly, in the nectar management approach, overcrowding swarms are not a problem. A key consideration of nectar management is the deliberate provision of space very early for colony growth in brood volume and population. It should come as no surprise that this series on survival traits is written to promote the concepts of nectar management, which are based on those survival characteristics. Nectar management is a reliable swarm prevention approach with the side effect of increasing honey production.

The descriptions of colony activities or "internal operations" presented to this point are consistently repeatable in all kinds of seasons. Some seasonal variations in timing can be traced to forage availability in that location, that season. The indications reported until now can be substantiated with anecdotal observations. No scientific tests have been performed to verify any of the reported observations. The writer of this series is just another beekeeper who does his own thing, by himself, in the boondocks. He is not staffed to mark and count bees. Those are very poor credentials for taking on the bulk of beekeeping academia, but it's important enough to me that I try.

The seasonal colony operations and the reproduction operations will be integrated as seen in Central/ Middle Tennessee. The composite internal operations will be limited to the early season build up, Spring swarming season, and subsequent beginning of the main flow. The hypothesis parts fit together well and explain some vague elements of the popular literature. The following descriptions may not be 100% correct – some interpretations of observations is involved. But we believe it to be a fairly accurate presentation of what is happening in your beehive in the Spring season.

The summary chart presented includes several controversial entries. Elements of the following hypothesis are factored in. The changes described in earlier articles are based on solid observation, but elements of the hypothesis deal with worker bee duties. Although the duties are supported by observation, the evidence is circumstantial. A full explanation of any one of those would take more print space than available for a single article. For the most part, even anecdotal evidence will not be included. The intent here is to provide an overview of Spring colony operations tailored to survival and reproduction. Subsequent articles may provide anecdotal evidence of the more controversial parts.

The development schedule by calendar dates is for the Alabama/ Tennessee state line. Climatic conditions locally are close to median conditions for the European honey bee races. Unlike the northern tier of states, where bee literature emanates, we have a better opportunity to see operations as they might be in their origins. One northern "expert" told me he did not believe the colony saved a reserve of capped honey through the swarm season. He would only need to tend bees for one season in Tennessee to revise his opinion.

The first horizontal section of the summary chart is the period dedicated to generation of the reproductive swarm. This period is actually divided into two phases. In the early build up the emphasis is on honey consumption for brood nest expansion. Swarm preparations are dependent on many variables such as colony overwintered strength, forage availability, flying weather, etc. There is, therefore, no calendar reference for the start of swarm preps. Stronger colonies, under good environmental conditions, might start swarm preps in late February, and weaker colonies not start at all.

In addition to the opinion that this period is dedicated to reproduction, this hypothesis has a more controversial aspect. Anecdotal evidence suggests that nurse bees graduate to foraging capability, *with-*

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out passing through house bee duties. This is a major divergence from literature descriptions, but makes good sense from an efficiency perspective for two good reasons. During the build up they are not storing honey. Nectar is used for feed. There is no need for nectar processors or wax makers. Second, early season foraging opportunities are limited to short duration periods. To be able to send nearly the whole work force to the field during those short windows of opportunity is a definite asset. The colony operations are tailored for efficiency. There should be little disagreement that wax makers and nectar processors are not needed during the build up period, but the shortage of house bees is not limited to those duties. When you look for other clues, you will find them.

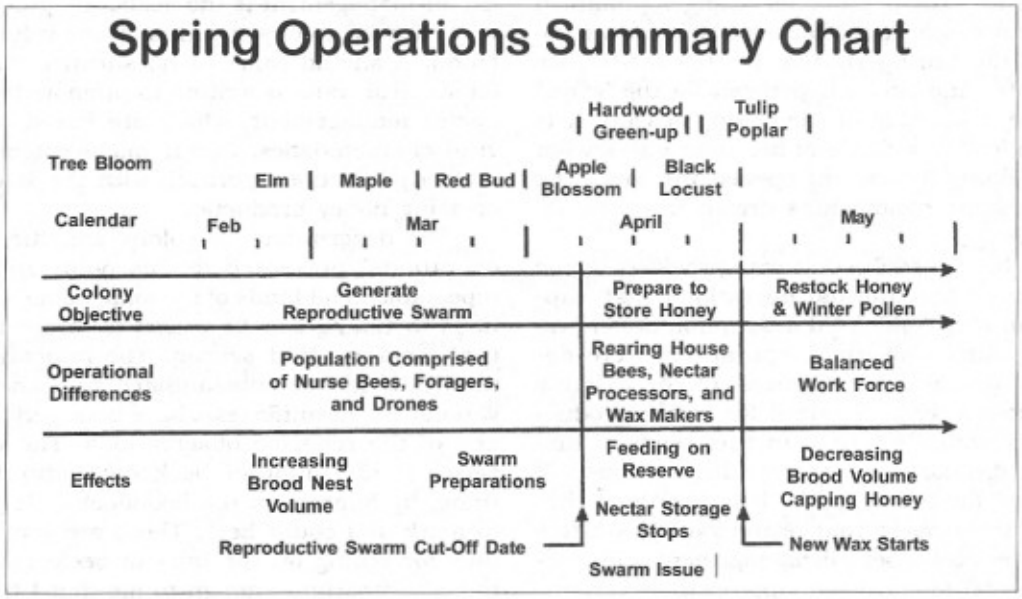
It was mentioned above that the parts of this hypothesis fit together well. The minimal presence of house bees above nurse bee age during the build up provides an introduction to the storage lull the last three weeks of April. At reproductive swarm cut off the colony must generate the house bees to support restocking Winter provisions. The storage lull is a strong three weeks, or a worker brood cycle. We conclude that the colony internal operations for this period are dedicated to rearing the house bees for storing. When the colony emerges from the full brood cycle with a full complement of house bees, they are prepared to store honey at efficient rates. The wax makers and nectar processors are available to support nectar foragers with curing and capping honey. We have no knowledge on how many house bees are required to support a nectar forager. If that data is in the popular literature, we missed it. Intuitively, we would guess there should be more house bees than foragers for the "main flow." Tongue drying sounds like slow work and wax makers have a reported 10 day delay to secrete wax.

In a declining brood volume there would always be fewer house bees than foragers. That is, if we assume about equal time as house bees and foragers. Each brood cycle is smaller than the last, and house bee duties come first. With standard management brood nest reduction is underway in the swarming season. With nectar management brood nest reduction starts early in the storage lull (about mid April).

The colony investment in a full brood cycle of rearing house bees is another indication of efficiency in survival tactics. This is done at the peak of woodland forage availability. Note on the chart that black locust and tulip poplar overlap at this time. If the build up population is heavily weighted with foragers, (very few house bees), then a full brood cycle of house bees makes sense. For reasons we will not go into here, the accumulation of foragers during the build up to swarm also makes sense. A concentration of foragers has benefits for both the swarm and the parent colony.

When the colony has wax making capability at the beginning of the "main flow," honey accumulation starts in earnest. This is the period after May 1 on the chart. We put quotes on "main flow" because it is *not* a function of field nectar availability. Locally, field nectar has been plentiful for six to eight weeks prior to that time. The internal operations of the colony in *preparing* to store honey have been completed at the appearance of new wax. Contrary to popular opinion, the appearance of white wax is not related to field nectar availability.

We are aware that all entries on the summary chart have not been described above. The entries on the chart were intended to be self-explanatory. The top section identifies objectives of the colony, the middle section reflects colony operations, and the bottom section of effects identifies the indications that can be seen by the beekeeper. If you have questions or comments, I am never too busy to talk bees. BC



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