Management For Nectar Collection

Walt Wright

In this segment, some of the internal colony operations (objectives and activities) that influence nectar/honey accumulation will be described. In the period up to the "main flow" appearance of new wax, internal operations have more influence than the availability of nectar in the field. The over wintered colony is preoccupied with reproduction in the early season and only forage for nectar needed to support that objective. Field nectar abundance is not reflected in the amounts brought into the hive prior to new wax at the start of the "main flow."

The literature treats top or bottom supering as a matter of beekeeper preference. Literature references note the extra effort involved in bottom supering, but do not make a recommendation for either. When you understand the colony internal operations and storage traits, you can apply those characteristics in your judgment.

Substantial description was provided early in this series of the honey bee's origins. The colony's adaptation to life in the hollow tree really is relevant to your manipulations. Nobody moves comb or adjusts available space in a fixed volume residence. Bees' survival instincts are disrupted or disturbed by beekeeper activities. A couple of traits will be identified first that reflect some difficulty on the part of the colony to adjust to those unnatural changes.

Once the colony has started working in a super, the work will continue in that super when moved up or down in the stack above the brood nest. It doesn't matter whether the "work" is retrieving honey for feed or storing new nectar, the work force stays with the relocated super. There must be a lower limit where this is not true, but if a fourth of the comb surface is covered with bees, they continue the work after relocation. Raising the super above two or three empty supers does not discourage the work in progress.

Second, the colony will generally not use added space immediately. It takes some time for the colony consensus to adjust their "space-available" perception. Inspection of the added space may start promptly under some circumstances, but even that is not guaranteed. There are exceptions though. In all cases, some worse than others, there is a delay between adding space and the colony's readiness to use it.

Neither of the above characteristics is likely to cause significant impact on honey production. Both are included here to encourage you to become familiar with the bee's development schedule for your area. When you know what operational changes to expect, and when to expect them, you can anticipate the needs, and adjust space so you don't reduce colony performance.

The next trait to be described *does* affect honey production. The colony has the ability to *anticipate* a result that affects the balance of population and stores. It's routine in the hollow tree but becomes significant in a managed beehive. Basically the colony has the ability to make adjustments in operations before the need becomes critical.

Some experts still recommend that you should super as needed. "As needed" is generally described as the last super nearly filled, or half to two thirds capped. The bees anticipate meeting survival requirements of filling their cavity, and start brood nest reduction well before filling their last super. The lesson here is to over-super to keep the colony striving to fill the space available. The bees, whose objective is to fill the available space, foresee that filling is close and start brood nest reduction. One other consideration that is related is that 4,000 bees can't find workspace in a partial honey super. The combination of anticipation of meeting survival requirements and a surplus of workers without space leads to accelerated brood nest reduction. Brood nest reduction automatically reduces the work force to exploit the trailing edge of nectar availability. A robust population at the beginning of the main flow can fill three or more shallow supers with workers at the same time. Why would you want to limit the space for them to do their thing efficiently?

When the work force is compressed by supering "as needed," another undesirable effect is created. The colony will often fill the bee space between top bars of a lower super and the bottom bars of the next higher super with cells of honey. The accumulation of honey in the interbar space makes separation of supers more difficult at harvest time. Fractured cells of honey are mostly wasted and create a riot of robbers at harvest. The streamers of trailing honey between the hive and the truck leave a path to the truck. More problems! We

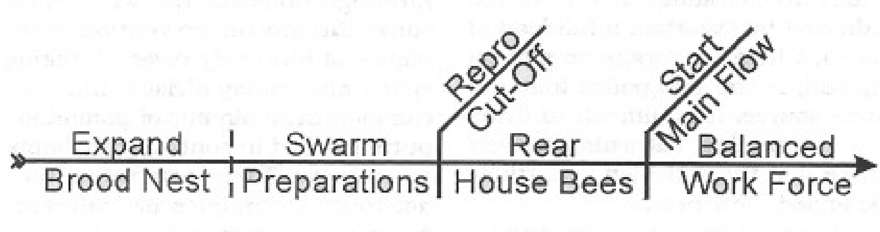

Figure 1. Four main divisions in colony operations.

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might add that the waste of interbar honey can count up. The 3/8-inch

on the colony reaching the maximum safe brood nest expansion. The timing of that operational change is affected by many variables. In addi-

tant to understand that the colony is reluctant to store nectar above their reserve of capped honey. If you intend to take advantage of the

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making capability uildup the nectar rally remain open earance of white inning of the main seen some colo-p cured honey at brood nest with poor results.

em that bottom he buildup would tar accumulation. for two reasons. I in the efficiency system, First, if I ectar above their

water is available very little foraging for nectar is required. Foraging for pollen and water has priority. Pollen is required for brood feed and water to thin honey to feed consistency. If water is not readily available, the colony can use nectar to thin honey.

The exception to the above generalization is that the colony places higher priority on empty cells within the cluster than on pollen for brood rearing. If there are empty cells, from V-mite attrition for example, the colony will forage for nectar on a priority basis. When the empty cells within the cluster are filled with nectar, they can change back to normal foraging patterns. An early season check of landing board traffic can alert you to empty cells in the cluster. If a high percentage of bees are returning with no pollen or split loads, that colony needs feeding. Split loads are indicated by less than a full load of pollen, where the forager is gathering both nectar and pollen from the

overhead nectar storage. The weaker colony, then, will generally not store nectar overhead until the "main flow."

The colony that is strong enough to start the swarm prep brood nest reduction (second segment of Figure 1) also will typically not store nectar above the reserve. They will normally honor the reserve, and any nectar stored will be used for feed and decreasing the brood nest size. Progress in brood nest reduction leads to the starting of swarm cells. As long as the capped honey reserve is continuous across the top of the brood nest, the colony can, and often will, ignore empty comb above. But when the upper level of brood reaches *to* the empty comb, their perception of the empty comb immediately above is improved. Nectar storage moves into the empty comb above. Overhead nectar storage tends to offset brood nest reduction and inhibit swarm preps. Although done for the wrong reasons, the swarm prevention techniques of hive body reversal, taking splits, and colony division have the

dependant on sev

A. Since the co they will fill cluster volum accumulate n
B. Some curing taking place weather by vi in the cluste maintain the level by conti with addition
C. Without wax- in the late b cells will gen until the app wax at the beg flow. We hav nies try to ca the top of th old wax with

It would se supering during produce more nec I have not tried it have confidence aspects of their raise a super of season merits.

You may have noticed that we put "early flow" and "main flow" in quotes. There is a good reason for this. Both are misnomers. There is only one Spring flow. The "early flow" is the upswing and the "main flow" is the down swing. In between is the peak of native woodland forage and the bees add no nectar at that time. The hive scale, if used to show nectar in the field, lies with a capital "L." The recorded weight changes are seen through the operational changes of the colony being weighed.

If you doubt the validity of the above observations, take a walk in the woods during the three-week lull in nectar gain. When hardwood leaf-out is in progress, note the trees in bloom. You might not recognize the streamers of oaks and nut trees as flowers, but you couldn't miss black locust. And how would you know that oaks were not a nectar source if it always blooms in the storage lull? One season, I recorded several other trees in bloom where binoculars were needed to see the tiny blooms. A local example: hackberry.

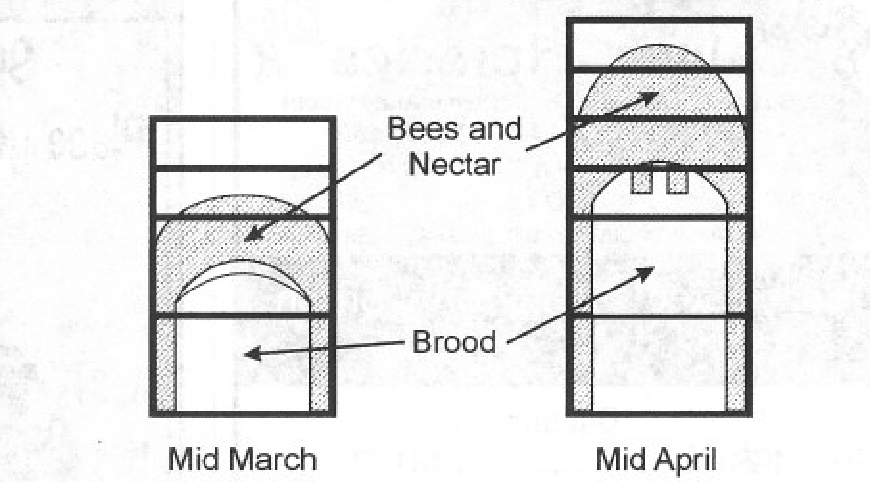

Figure 2. *Cluster volume vs. brood volume.*

The lack of storage of overhead nectar during the period after reproductive cutoff, and prior to the white wax flow, is open to discussion. If my hypothesis is correct, it's the period that the colony is rearing house bees to support restocking Winter stores. Another observation, coming from experimentation with nectar management, is also puzzling. During the lull in overhead nectar storage, the cluster, or concentrated bees, *does not grow*. Although the colony is generating a full brood cycle of new bees, the volume of concentrated bees remains the same. If the colony will only store nectar within the cluster perimeter during buildup (and that is true) failure to increase the cluster size would account for failure to add nectar at the top. Note that if you have swarming plus or minus a week of white wax appearance, consider them overcrowding swarms, and review your management program.

One last note on the overhead nectar gain during the three-week period prior to the "main flow." If you have practiced supering "as needed" during that period, the lull might not have been conspicuous. The natural cluster comfortable height has been compressed all the way. When a super is added, after some delay, the cluster expands into the added super. Enfolded in the cluster, that super is now filled. When the next super is added, the sequence starts over. It would be possible to add supers through the storage lull and have the colony continue to fill them. This doesn't happen if two empty supers are maintained through the buildup. There is a definite three-week period when no supers are required to maintain two empties. Note that cluster size, as shown in April of Figure 2, is static (unchanged) for that three-week period, but the brood volume is decreasing from the top.

But why doesn't the cluster grow? Our best guess is that the wax makers being generated for the white wax flow congregate in the upper levels to raise the temperature to the 100°F level required for wax production. If you have a better answer, send me a postcard. Again, to gain nectar storage through this period, you might try bottom supering with the risks noted above.

The last period of Figure 1 is the white wax flow. As we see it, there is no advantage to bottom supering for extracted honey during the white wax flow. Another colony characteristic is that they will readily open gaps in the solid cluster during the white wax flow through supers that are completed by capping the honey. With warmer ambient temperatures, the clustering is no longer required. As long as ample space is maintained at the top of the colony, honey accumulation is only limited by bee power and field nectar availability. And sensing the nectar trail off, they will manage to get the brood nest reduced in a timely manner. Or that's what happens in Tennessee.

We top super all the way, by maintaining two empty supers of drawn comb. The often expressed concern about wax worm damage to extra empty supers at the top, is unfounded. The wax moth does not become active in my area until early in the white wax flow. Honey bees get the jump on hibernating insects by Wintering as a colony. They will be patrolling the whole hive well before the wax moth is active in the Spring. That may not be true for milder climates.

This concludes the descriptions of survival traits on which nectar management is based. It is low-effort beekeeping that has the side effect of increasing honey production. Are those features not of interest to you? BC

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