

FALL FEEDING

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Walt Wright

All the experts have had their turn at generating an article on the subject of feeding honey substitutes. Those articles generally provide the pros and cons of the various popular techniques such as top jar, division board, boardman, etc. There is no substitute for comb feeding when a large amount of feed must be moved in a short time. This is especially true in clustering temperatures. Other feeding techniques permit limited access to the source, as in a perforated mason cap. Comb feeding provides an expanse of open cells to encourage literally thousands of bees to move feed at the same time.

First some background on when and why Fall feeding is required. As is the case in most of my output, some literature bashing is included in the following

treatment. The literature, coming from the northern tier of eastern states, does not seem to recognize that they are keeping bees outside the normal climate range of the European honey bee. Perhaps that opinion should be supported with a few brief statements: (1) If you trace the U.S./Canadian western border around the globe to Europe, it passes south of England and north of Paris in northern France. Neither English nor French Winters are in the same league with the winters in Minnesota. (2) The 60-degree boundary of northern Saskatchewan and Manitoba, Canada passes south of Helsinki, Finland. The southern end of the Scandinavian countries is well populated and the northern area of the Canadian provinces has mainly First Nation people living there. (3) Central Europe does not



"The ratio I use is 1/2:1,
sugar:water."

have the equivalent of the "Alberta Clipper" moving southeastward that brings the polar air mass in Winter to the U.S. Northeast. (4) Latitude is not the only factor in Winter severity.

The point of this trivia is that European Winters are less severe than north central and eastern U.S. Winters. Do you know of a strain or race of *Apis M.* that is native to Central Norway? If so, I could be encouraged to re-think the opinion that north central and north eastern U.S. is outside the natural climatic range of the European bees we use. In our coldest regions, the honey bee survival traits are pushed to their marginal limits. One aspect of their survival format is pushed beyond limits. They want to Winter the cluster on a brood nest filled with nectar after brood rearing ceases in the Fall. In northern areas where frost/freeze weather stops forage availability while they still have brood, the colony cannot make it happen. They are forced to relocate up on solid capped honey.

To get back to feeding, this article will stop the discussion here with the note that feeding may be required to fill the brood nest for wintering. More details can be found in two earlier articles, the Nov. 03 and Sept. 04: *Bee Culture*.

The literature recommends heavy syrup for Fall feeding. That is a valid recommendation if you have been both greedy and callous in your harvest of honey. Were you not greedy, you would have left enough for the bees to Winter. Were you not callous, you would not offer a substitute for their hard-earned Winter rations. In case you hadn't noticed, I look at beekeeping from the bee's perspective.

In northerly locations where brood rearing extends beyond forage availability in the field, you need to consider assisting the colony in preparing the brood nest. In one of the earlier articles, you were invited to check these concepts by opening a couple colonies in December. If, on your last hive opening in the Fall the cluster was in the lower deep, and in the upper deep in late Winter, they may have relocated upward off the empty brood nest. You likely didn't check it out yet, but you have another opportunity to do it this week and through the month. The colony can be enticed to move back down to the brood nest if there is sufficient mild weather left to move the feed.

In early Winter the typical colony has gone into the conservation mode. After stopping brood rearing for the season, they go into essentially full-time clustering. Both those actions reduce honey consumption. Without brood, the cluster internal temperature is permitted to drift lower and the insulating bees of the cluster shell become inactive. Once they reach this conservation status, they are reluctant to break cluster. If the brood nest has been properly filled, the fuel to warm the cluster is readily available for early Winter. If the brood nest doesn't get filled, and they are forced to relocate up onto solid capped honey, mid Win-

ter brood rearing is slowed.

The timing of the sequence above suggests a need to feed by a means that moves feed in minimum time. Comb feeding meets that objective. Assuming some mild days are present between waves of ever-colder days, there is some time to help your bees fill the brood nest. This beekeeper highly recommends taking the time to do it. You will be rewarded by better wintering of the colonies in your charge.

Filling comb with simulated nectar requires that you impart some velocity to the feed. The same surface tension that keeps nectar in horizontal comb cells resists penetration from the other direction. Dipping comb won't work. I probably shouldn't publicize my mental ineptitude, but several ways were tried to impart velocity to the feed. First, using a quart jar with perforated cap like a saltshaker. Two problems with that approach: slippery jar and it took as much time refilling the jar as filling comb. Then, a garden sprayer with a fan nozzle attachment was tried. Too much time pumping up the sprayer pressure. Finally, the light bulb came on: Try gravity. Gravity works very well.

The picture block shows the simple process. In the larger picture at the left, Perma Comb®(PC) is being filled with nectar substitute. PC is rugged and can stand considerable abuse. Both PC and natural comb in wooden frames will float in the tub of feed. Higher sidewalls on the tub of feed are recommended to contain the splatter of feed in the surrounding area. It's not advisable to antagonize the regular kitchen crew.

The stop action film shows individual droplets of feed between the can and the comb. In use, it looks like a sheet of feed and only takes a few seconds to empty a half can of feed. One pass, over and back, will fill most of the cells. If you want 100% filling, it may take another half can. Quick and dirty! Scoop up a can of feed, fill one side and flip the frame over to fill the other side. The lower right picture shows draining the excess off the comb. Invert the frame to avoid drips on the way to the transport box. Very little feed is lost en route to the bee yard. (That surface tension thing.) The transport tray is shown in the setup photo at upper right. Those are homemade telescoping covers that never got metal covers. There were so many uses for them, including this one, that the inside joints were caulked to make them watertight. Any drips collected can be poured into the hive when the comb feed is installed.

A three-pound coffee can is the main equipment needed for this process. The bottom line of holes is shown: center-right. This is not my best can. It just happened to come to the top first. Notice the staggered line of holes on the left side in the photo. That arrangement of holes works better than the solid line of holes on the right side. If the holes are too close, or too large the flow tends to converge into a stream. The top of the can is not shown. One side is squared off to make a scoop to pick up feed in the tub and the opposite rim is folded inward to make a finger grip.

Several years ago a time test was run to see how fast a super could be filled with this procedure - in case I ever got around to writing this article. In the hurry-up mode care was not taken to fill every cell (estimated at about 90% of capacity). And draining off the

excess was limited to a couple quick shakes over the tub. Nine frames could be almost filled in seven minutes. Moving boxes in and out of position, and mixing another batch of feed took almost as much time as filling a super. But a medium super could deliver more than two gallons at a time - with one hive opening. There is no feeding system that is man-hour free. We consider this system to be competitive in man-hours spent and has advantages that others do not have.

The literature recommends a two to one ratio by weight for Fall feeding. That's fine for supplementing Winter stores overhead. But if the feeding is intended to fill the brood nest, the bees naturally use nectar. And what is the ratio of sugar to water in Fall nectar? It's certainly not two to one. In the September ABJ, George Ayers reports that the sugar content of New England aster is about 25%. Further he says that that amount is "fairly dilute." Until I get more data, I'm using 1/2 to one as a mixture ratio to fill the brood nest. That's roughly a four-pound bag of sugar to a gallon of water. In the past, I have cut 55% HFCS half and half with water. That's in the same ballpark. Those of you that have more time to burn can research this question further. Let us know what you learn.

Some beekeepers recommend weighing hives in the Fall to verify adequate Winter stores. Like the "heft" test, preparation of the brood nest is not fully verified. There are so many variables in per-hive weight that it

"Try gravity when filling combs. It works."

would be quite difficult to select a go/no go weight that proves proper brood nest filling. As an example, just the variation in honey weight in a full deep can obscure the nectar weight in a Fall brood nest.

In my area, colonies typically get the brood nest filled with nectar after brood nest close-out. But not always. One year there was almost none and another year about half filled. As we go north to the Canadian border, the probability gets worse to the point where it's almost a certainty that it won't get done. When you get a killing freeze before brood nest close out, there is no field nectar. Since I live about six miles from the Alabama state line, there is a large area where this feature of colony preparations for Winter has some impact.

If you enjoy Winter losses, you can totally ignore this article. **BC**

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