Stahlman beekeeping notes for 2021

Issue # 18 Bring on May

This is swarm season and by all accounts the honey bees have been quite successful in the effort to swarm!

This week I am going to be discussing problems with comb building by bees installed on plastic foundation.

Bees need a good supply of food before they begin to build comb. This begins naturally in the spring of the year. I have seen medium supers with foundation drawn out in a week's time. With a strong honey flow, bees can do a remarkable job building comb.

The first sign of comb building in the spring is white wax.

Incorrectly drawn comb on foundation is often a problem beekeepers encounter.

Wax building basics:

Much research has gone into the study of honey bee wax and comb building.

- **A study done in 1912 by D. B. Casteel, Ph.D. Professor of Zoology University of Texas makes some important statements:**

1. **Wax is produced by the worker bee in the form of scales.**
2. **Wax plates (eight) are located on the ventral worker bee's abdomen (two scales are produced on each of the last four visible segments).**
3. **The wax is secreted by glands located on each of the four segments.**
4. **Unless accidentally dislodged the wax scales are always removed and manipulated by the bee which secretes them.**
5. **Bees which are producing wax may also rework the masticated wax laid down by others.**
6. **Workers actively engaged in secreting wax, engorge themselves with honey**

The above paper is referred to by most scientists researching beeswax and comb building. i.e.: the 1992 The Hive and the Honey Bee revision published by Dadant & Sons.

Also, under the topic "Activities and behavior of Honey Bees" in the above book: the following research -

- **Lindauer, 1953 – When building comb on foundation honey bees work together "one bee sticks a little ball of wax on the comb surface, molds it carefully, then a moment later another bee chews it off and reattaches it only a millimeter or so farther away. Hundreds of bees participate in the construction of a single cell."**
- **Gontarski (1949) – ascertained that bees building combs can adjust themselves in the direction of gravity.**
- **Darchen (1959) – demonstrated that the chains which bees form in their building cluster play an important part in regulating parallelism of the combs.**

A photo from Facebook posted by Kim Pettit Oct. 3, 2019 shows as clearly as can be seen the wax scales on the last four visible segments.

Wax glands are developed and active in bees 12 to 18 days old. One might note that bees in a swarm can build wax comb almost overnight. One reason for this is the fact that bees engorge themselves with honey prior to leaving the hive.

Comb building requires the honey bee to consume large amounts of nectar/honey. This occurs when bees find abundant nectar secreting plants or when they are fed sugar syrup.

Thus, I am checking the new comb foundation I placed into my hives a week or so ago. Here is what I expect to see:

I use black plastic inserts in wood frames for my honey supers and brood chamber frames. I buy double waxed foundation. I usually place a frame with drawn comb and nine new frames of plastic foundation. The drawn comb draws bees into the upper supers.

I always go back to my bees to check to see that the bees are drawing comb as they should. Notice the new wax comb completely fills the frame. Every cell on this frame will serve to

store nectar/honey. I say store nectar honey because until the honey is capped over it contains a high moisture level which could cause the nectar/honey in the frame to ferment.

But if I make an error in frame placement, I can end up with a mess. Remember the bee space rule! When frames are spread too far apart, the bees will build comb in the space between the frames.

The following photos I have taken over the years show what happens when the bee space rule is violated.

This happens when too much space is left between frames. Honey bees will build both out from the foundation base or a parallel comb down from the top bar. The photo illustrates both.

Many of these mistakes can be avoided by checking comb development soon after the bees begin working new foundation or frames of drawn comb placed into a hive body.

Beekeepers can actually use drawn comb to be extracted for honey in a special way. If comb is drawn to the proper bee space rule, the beekeeper can place either 8 or 9 frames in a honey super. Rather than filling the space with burr comb, the bees will build additional wax to each cell before capping it over with honey. (This does not work for new foundation frames)

The lengthened cells created by the bees can then be uncapped much easier and still produce as much honey as 10 frames with the normal bee space.

This is what happens when the bee space is too wide between frames. The bees will build a natural comb often down from the edge of a top bar. Note the comb is built down – not across from one frame to another. Brace comb or burr comb are special construction forms used to support comb built between two existing structures such as a bottom bar fastened to a top bar or comb built to attach two top bars.

This is another common problem when using plastic foundation. The bees will begin to draw foundation on the plastic but quickly adapt to old habits. On this frame the honey bees began building comb at five locations on the side of this plastic foundation. If caught early, a frame such as this can be rescued by simply using the hive tool to remove the mis-placed wax comb, rewax the foundation, and make the bees build the foundation as intended.

New beekeepers can save a lot of work repairing a problem, if they check hives often for issues that may develop like the photos above.

The following photos show pictures of mis-managed honey bee hives:

If a medium or shallow frame is used in a deep standard hive body, the result will be comb built from the bottom bar down to fill the space below. If the frame contains brood as shown, it would be best to wait for the brood to emerge from all cells before corrective action are taken.

This same principle can be used by beekeepers to trap Varroa mites using non chemical management techniques. Comb built like this often contains drone comb.

There are exceptions to the rule – in this case to deliberately use a medium frame in the brood chamber to attract Varroa mites.

This last photo shows a frame taken from an abandoned hive. The hive had live bees after being lost or forgotten for many years. In order to remove the bees from the hive, it was necessary to remove the sides of the hive body because no amount of prying the top bars or hammering bottom bars from below would allow frames to be removed from the hive. All frames were glued together with propolis. This is what happens when frames are not removed from a hive over a long period of time.

The photo below is of an abandoned bee yard.

The person who owned this woods shared that the beekeeper just stopped taking care of the bees about 10 years earlier.

Hopefully, your bees will receive better care than these bees. The one hive standing was the only hive at this location of hives still alive. Not a single box could be saved, bottom boards were sunk in the ground and wax moth had destroyed any comb in the boxes except for the one that had bees. I discovered this abandoned bee yard in Ohio not 30 miles from Columbus, Ohio in 2012.