



## *Brushy Mountain Bee Farm*

610 Bethany Church Road  
Moravian Falls, NC 28654  
1-800-BEESWAX (1-800-233-7929)  
www.brushymountainbeefarm.com

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## DESCRIPTIONS OF PHOTOGRAPHS

### 1a. Capped Honey

This frame shows mostly capped honey cells. The bees collect nectar and store it in the cells where the moisture content must be reduced to below 18.4% at which point it is considered 'ripe' and ready for the bees to cap. The bees secrete wax from their wax glands on their abdomen to cap the cells. When the honey is first capped the frame appears a pretty white color, but as it ages and bees walk across the cappings, the color darkens. Typically frames are filled up from the center of the frame outward, and also from the center of the super out toward the edges.

### 1b. Queen

There is one queen per colony. The queen is identified by her long and slender abdomen. The drones are also larger than the workers, but are more round and usually have more hair on their body. In the picture there is a circle of bees around the queen. These bees are called the attendant bees whose job it is to take care of the queen. They will groom and feed the queen as needed. Also note the capped honey to the left of the frame and the cells full of different colored pollen on the right side of the frame.

### 2a. Pollen

Honey bees collect nectar and pollen from flowers. The pollen is carried back to the hive by a bee on its pollen sacs, and then it is mixed with a small amount of nectar and stored in the cells of the hive. Pollen is usually found in the brood chamber, as its main use is for feeding the larvae prior to being capped. Also on this frame is some capped honey on the left side, and a few capped brood cells in the center.

### 2b. Queen cup

Queen cups are not unusual and should not cause alarm. These may be used if and when the workers feel there is a need to produce a new queen, but may remain unused for very long periods if not needed. If there is a need to produce a new queen, the workers are able to transfer eggs into the cup and then feed it the special diet of royal jelly it needs in order to develop into a queen. During this process the queen cup becomes longer and more oval shaped as the worker bees add wax to form the queen cell. To the left of the circle is capped brood and along the top edge is capped honey.

### 3a. Larvae

This is a brood frame showing a close-up of worker larvae of various ages. When they first hatch, larvae appear as bee egg-sized, C-shaped, white "worms" and grow over the next six days until the "C" closes in on itself to fill the whole bottom of the cell. Some of the larvae, particularly near the top of the inset, have almost reached the stage where the attendant worker bees will cap the cell over with a wax capping as has already been done with about six of the cells in the upper right. Most of the brood to the left and in the middle of the frame has already



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completed the larval stage and is now capped. Its proximity to the open brood suggests that it was recently capped and therefore has close to twelve days before it will hatch.

### 3b. Eggs

The eggs are small, white, and elongated, appearing similar to grains of rice. They are placed in the bottom of empty cells by the queen. At first the egg stands on end, but as it ages, the egg will lay over on its side. It will remain an egg for three days before it will hatch into a larva. If searching for the queen, this would be a good place to find her.

### 4a. Mixed Brood

This frame shows brood on either side of the transition from open brood in the larval stage to capped brood in the pupal stage. The brood area is only covering about half of this side of the frame, which suggests either that we're looking at a hive late in the brood rearing season or that we're looking at a lackluster hive. The pattern itself is reasonably full, although it could definitely be fuller. The inset on the right shows mainly open brood in the larval stage. It is during these six days prior to capping that the "nurse bees" feed the larvae, so there is likely a higher proportion of nurse bees on this frame. As is typical, the brood area is mostly surrounded by cells of pollen. To the left of the brood there is some honey that has yet to be capped. If it were still very thin, it might still be called nectar. Along the top edge of the frame is a thin area of capped honey.

4b. This is a brood frame. The majority of it is capped brood, which is the pupal stage of the bee. After being capped for about 12 days, they will emerge as adults. This frame shows a much better brood pattern than the previous frames. The center of the frame is almost completely filled up with brood and there are very few empty cells. This is a sign of a good queen. In the bottom center of the frame is some younger larvae not yet capped, and on the left is pollen and uncapped nectar. In the top left corner is a small area of capped honey.

5a. This is an older brood frame. The center picture shows completely developed adult bees emerging from their capped cells. They chew the capping and then crawl out and begin working immediately. Around the outer edges is stored pollen and nectar.

### 5b. Small Hive Beetle (*Aethina tumida*)

One of the many pests of the beehive. An adult beetle is about the size of the lady beetle, it is uniform in color ranging from light brown to black. They are slightly elongated and have club shaped antennae and a shield shaped thorax. They are capable of flight and can spread easily from hive to hive. Small numbers of beetles in a strong, healthy hive are fairly benign, but if the colony of bees becomes weakened, then the beetles can cause problems (See 6a).

### 6a. Small Hive Beetle Larvae

It is the larval form of the small hive beetle (SHB) that causes problems in the beehive. The adults lay masses of eggs inside the hive. The eggs hatch after 24 hours and the developing larvae feed on the stored honey, pollen, and bee larvae. The SHB larvae appear white and worm-



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like, and they have legs. They are similar in appearance to the wax moth larvae, but smaller. They also produce a slime residue that acts as a deterrent to the bees, and in extreme situations, the colony of bees will abscond. As they feed, the larvae tunnel through the comb, leaving it unsuitable for reuse by future colonies of bees. When the larvae are done feeding, they will exit the hive and crawl away to a suitable spot where they will dig into the soil and pupate. After several weeks in the soil, they will emerge as adults and start the cycle all over.

### 6b. Varroa

This picture shows a comb from a hive with indications of varroa mites. Varroa mites are present, to one degree or another, in basically every hive in the continental United States, and no treatment is 100% effective. Although the indications of varroa mites aren't normally seen until the degree of infestation reaches fairly high levels, there are ways to inspect specifically for varroa mites including drone pupa inspection, mite drop counts using screened bottom boards, and a method commonly called the "sugar shake" test. The presence of just a single varroa mite on the back of the bee at the top of the blow-up on the right side suggests a large number of varroa mites that are out of sight. Another indication of varroa is damaged brood (see 7a, 8a, and 8b for some of the other causes of damaged brood). Mature varroa are reddish-brown to black and oval shaped. They are slightly wider side-to-side than they are long front-to-back. Against a light-colored background it is possible to see their legs, which are all close together in front.

### 7a. Chalkbrood

Chalkbrood is a fungal disease of developing bees. This condition commonly occurs in the spring time. Symptoms include mummified larvae in cells on a brood frame. Often it is obvious without opening up the hive because there will be a pile of mummies at the entrance dragged there by workers cleaning the hive. It is a fairly common malady and not detrimental to the hive. There is no chemical treatment. Requeening may help as it will break the brood cycle. Also avoid chilling brood. In enlarged picture there are only a few cells with chalkbrood. The other cells appear healthy.

### 7b. Wax moth

This frame has been ravaged by wax moth larvae. The adult moth is a little brown moth that lays eggs in the hive. The eggs hatch into worm-like, white, larvae that feed on the comb. As they feed, they tunnel through the comb and spin a web-like material leaving behind a mass of webbing and frass. When ready to pupate they chew an oblong indentation in the wood and spin their cocoon. When the adults emerge, they seek out a food source to start the cycle over. The adult moth can fly and therefore this pest can be spread easily. Strong colonies of bees can defend themselves against this pest. Often wax moths are a problem in stored equipment if not treated.

### 8a. Advance American Foul Brood (AFB)

AFB is by far the worst of the bee diseases. It is caused by a spore forming bacillus which makes it extremely hard to eradicate. It affects young larvae; one-day-old larvae are the most susceptible. Symptoms include spotty brood pattern, sunken and perforated cappings.



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Infected larvae appear brownish and runny and often have a foul odor. A good test is to insert a small stick in a suspected cell directly into the brown liquid, and pull it out slowly. An elastic like substance remaining attached to the stick when pulled out, forming a string, indicates AFB (See 8b). If available, contact your apiary inspection service immediately. There is no cure.

8b. The rope test is used to identify AFB. After inserting a small stick the size of a toothpick and removing it, if the brown substance remains attached and forms a rope between the stick and the cell, this is an indication that AFB is present. This frame also demonstrates other symptoms associated with AFB, such as the spotty brood pattern and the perforated cappings.

\*Special thanks to Jennifer Keller and the NC State University bee lab for writing almost all of these descriptions.