THE HIVE INSPECTION

What are you looking for?

and

What do you see?

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OUTSIDE OF THE HIVE

- What is the level of activity of the colony at the entrance of the hive?
- How does the activity compare to that of other colonies in the bee yard?
- Are the bees “bearding” (festooning) and what does that behavior mean?
- Is there any indication of robbing behavior?
- Are the bees bringing in pollen? What does that mean?

FESTOONING

Hanging out on the front of a hive. Just cooling off on the front porch on a hot summer day. Don't confuse this with swarming or robbing behavior.

ROBBING BEHAVIOR

Bees are all over a hive and can be on all sides. Flight patterns are erratic and frenzied. Installing entrance reducers may help to mitigate robbing behavior.

BRINGING IN POLLEN

Attached to the pollen baskets (corbicula) on their hind legs. Since pollen (protein) is used to make brood food, called “bee bread,” to feed larvae, there is probably, but not necessarily, a laying queen.

CHECKING FOR ADEQUATE STORES

- “Heft” the hive from the rear.
- How does the weight compare to that of other hives in the bee yard?
- Pull the cover off and check inside the hive for nectar and honey in the frames.
- Bees don’t consume unprocessed nectar.
- How much of the nectar is capped (dried) and ready for consumption by the bees?

HEFTING A HIVE

How does the weight compare to other hives? A scale is helpful but not necessary. Just lift the hive from the rear and compare the weight to that of other hives in the bee yard.

HIVE SCALE FROM ROSSMAN

- **Fisher's Hive Scale**
  - **Catalog number M100**
  - This hand held device is used to measure the weight of a hive along the centerline. It has an effective range of 20 lbs. to 250 lbs. The scale directly displays weight in pounds, revealing relative changes in weight as compared to prior weighings.
  - Cost $109.00

GETTING INTO THE HIVE

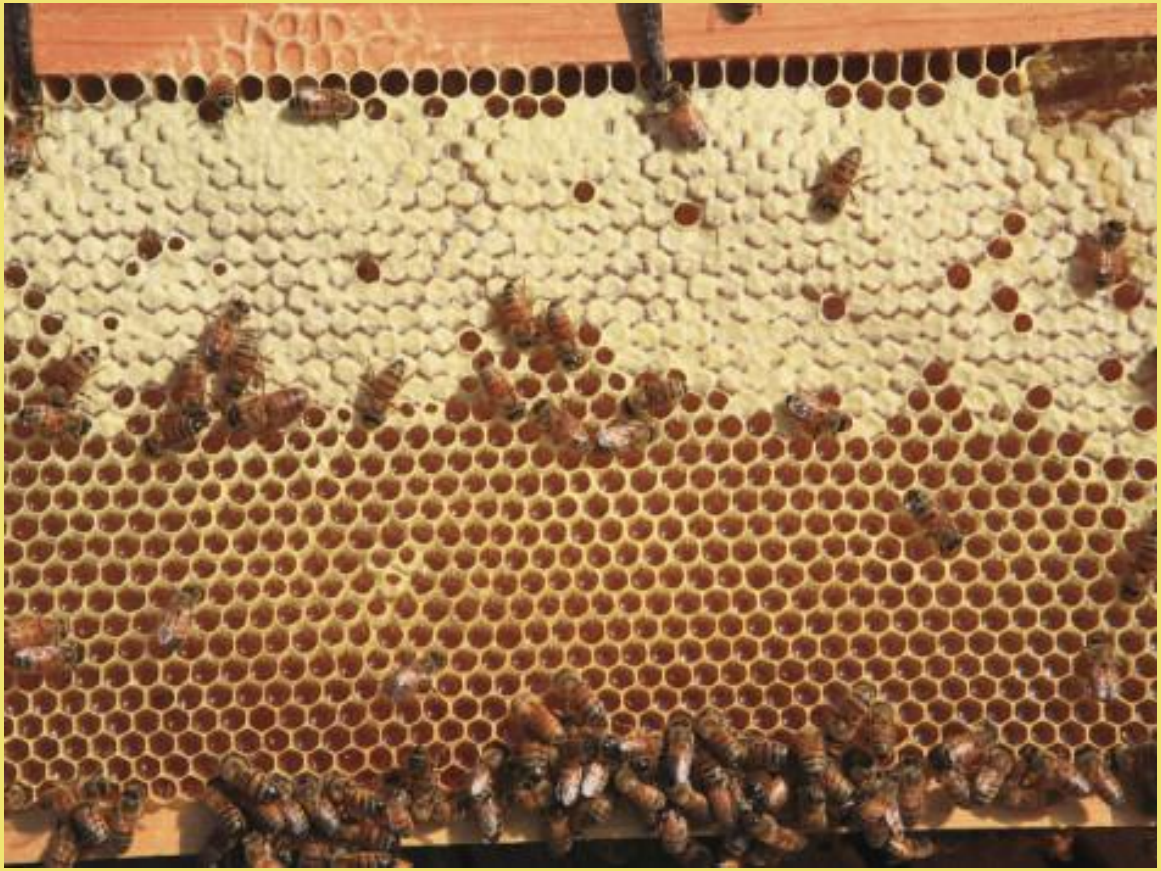
“Smoke ‘em”, don’t “Choke ‘em.” Use COOL smoke sparingly – just enough at the entrance and under the cover to calm the bees and get them down on the frames into the hive. This is a good example of too much smoke!

REMOVING FRAMES FROM THE HIVE

Start with an outside frame or one next to it, since the queen will probably not be on one of these. Using a frame grip can facilitate removal of frames by freeing up one hand for other chores. It also makes it easy to turn the frame over for inspection.

HOLD THE FRAME OVER THE OPEN HIVE

In the event that the queen should fall off a frame, holding the frame over the hive for inspection will help to insure that she falls into the hive and not onto the ground.



CAPPED HONEY AND NECTAR

Capped honey (dried to 18.6% moisture content or less) above and uncapped (unfinished) nectar below. Extracting uncapped honey can result in fermentation and/or granulation after bottling.

IS THE COLONY QUEENRIGHT?

- Find the queen (Yeah – right ☺).
- Look for capped brood with pupae (may be up to 21 days since the queen laid the eggs).
- Look for uncapped brood with larvae (up to 10 days since the queen laid the eggs).
- Look for eggs in the bottom of the cells (3 days old or less).
- No eggs doesn't necessarily mean a queenless colony. There may be a new virgin queen.

FINDING THE QUEEN

She's in the center of the photo. Not always this apparent! Marking the queen makes finding her a lot easier.

CAPPED BROOD

Great brood pattern – corner to corner with only a few skipped cells. This means lots of new worker bees to forage for nectar to make honey. Only a young, vigorous queen can do this. Note the drone cells across the bottom.

LARVAE AND EGGS

C-shaped larvae on the left and eggs that look like little grains of rice on the right, in the bottom of the cells. Eggs are really difficult to see! Stand with the sun to your back, shining over your shoulder onto the frame.

EVIDENCE OF A NEW QUEEN

- Queen Cells
  - Peanut shaped cells
    - Supersedure cells
      - Typically found on the face of a frame.
    - Swarm cells
      - Typically found on or near the bottom of a frame
  - Look to see if the queen has emerged
    - If the tip of the cell is open, either they have not made a new queen yet, or she is “out and about.”
    - Queen cells torn open from the side indicates that the emerging queen was killed by another queen.

OPEN QUEEN CUPS

These cups, opened at the tip, indicate that the workers are prepared to make new queens in these queen cups. The fact that they are “unoccupied” differentiates them from queen cells which contain larvae or pupae.

DEVELOPING QUEEN CELL

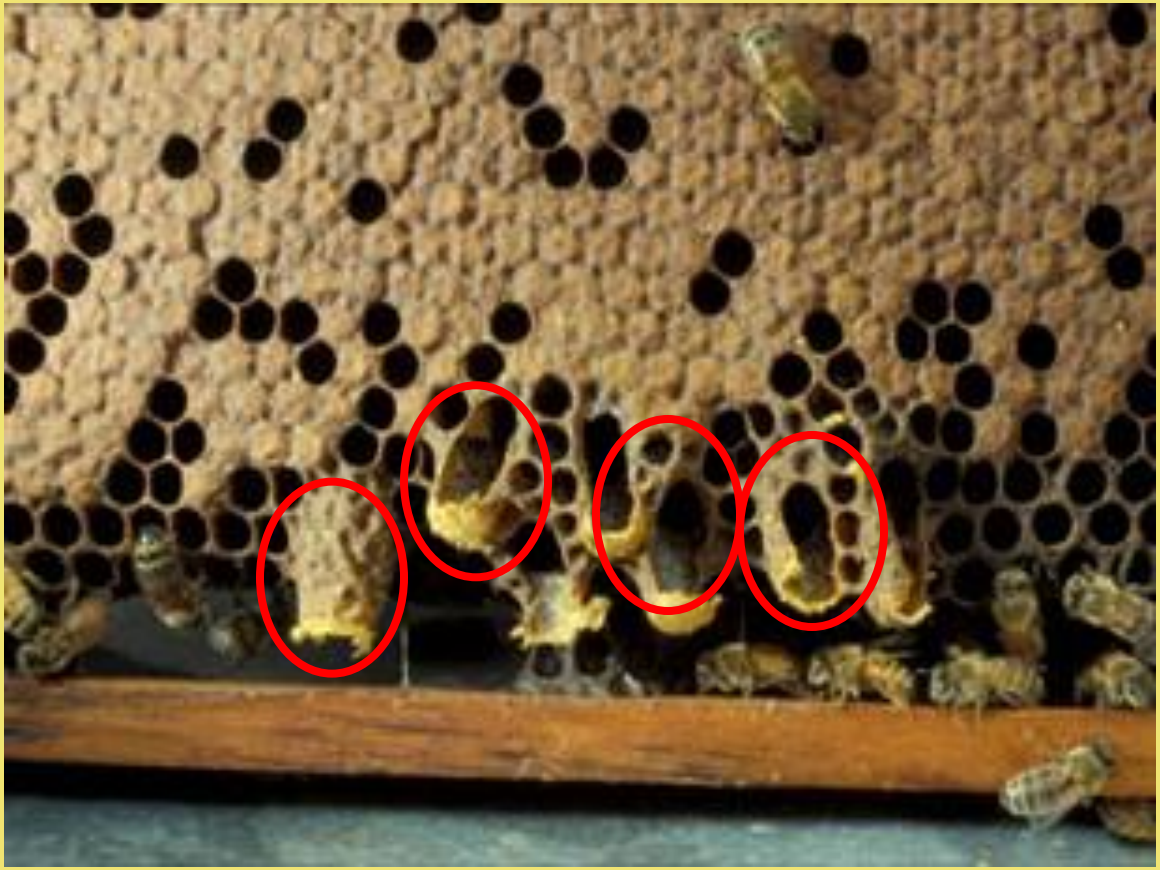
New queen larva being fed royal jelly by worker bees. When the larva develops into a pupa, the cell will be capped and it will take on an elongated, “peanut” type of appearance.

SUPERSEDURE CELLS

Several queen cells on the face of a frame. The first queen to emerge will kill the others and become the new queen of the colony.

SWARM CELLS

Two swarm cells along the bottom of a frame. One queen will emerge victorious and take over the colony while the old queen will leave the hive with about half the bees.



OPEN AND ABORTED QUEEN CELLS

The queen cell on the left has been opened at the tip, releasing the queen normally. The other queen cells have been opened from the side by the first emerging queen and the developing queens within them have been aborted.

LAYING WORKER(S) IN A QUEENLESS COLONY

When a queen is lost and not replaced, one or more laying workers may emerge and lay a spotty pattern of unfertilized eggs that mature into drones. Multiple eggs can be found in a single cell. No worker brood is present when this condition exists.

PESTS AND PARASITES

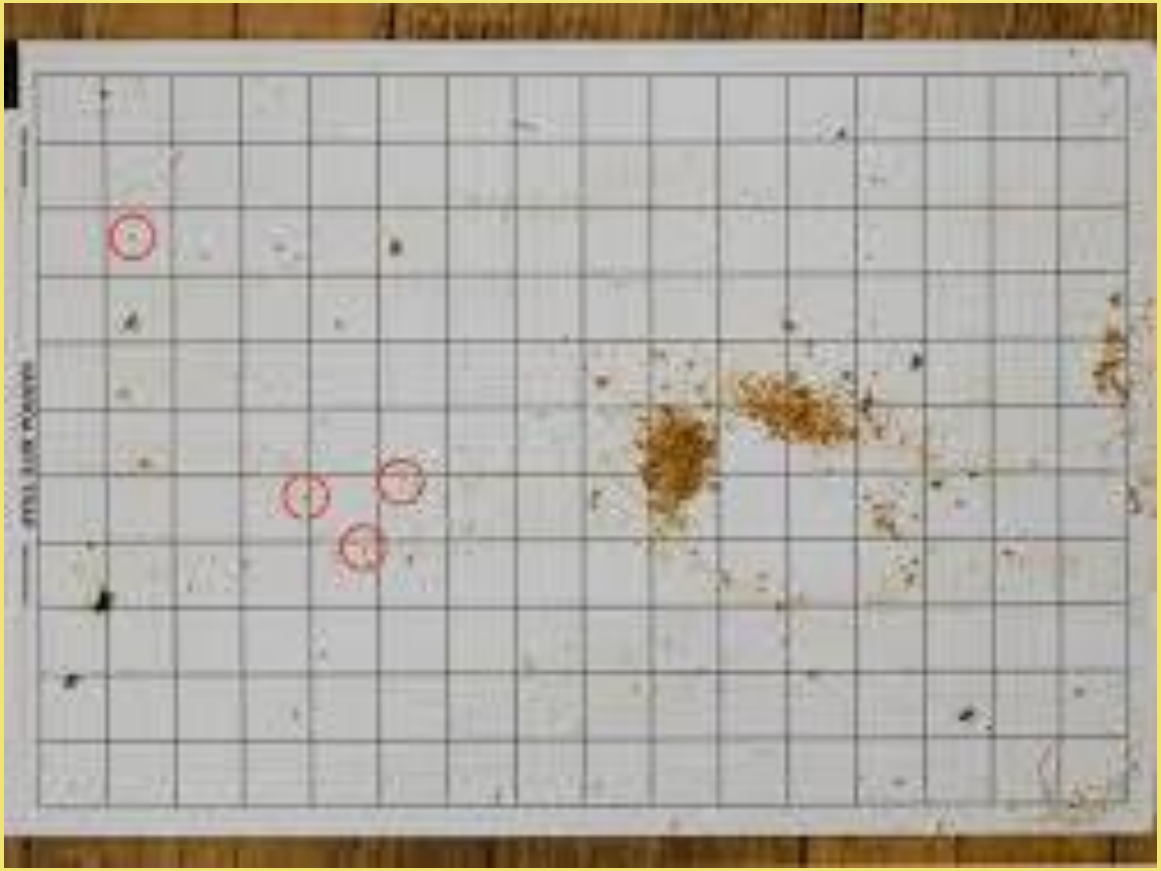
- Varroa Mites (*Varroa destructor*)
- Tracheal Mites (*Acarapis woodi*)
- Wax Moths:
  - *Galleria Mellonella* (greater wax moth)
  - *Achroia Grisella* (lesser wax moth)
- Small Hive Beetle - *Aethina tumida*
- Nosema (Microsporidian parasite):
  - *Nosema Apis*
  - *Nosema Ceranae*

VARROA MITES

Two Varroa mites on the back of a worker bee. These mites are large enough to be seen with the naked eye. Varroa mites are the primary cause of problems in a beehive.

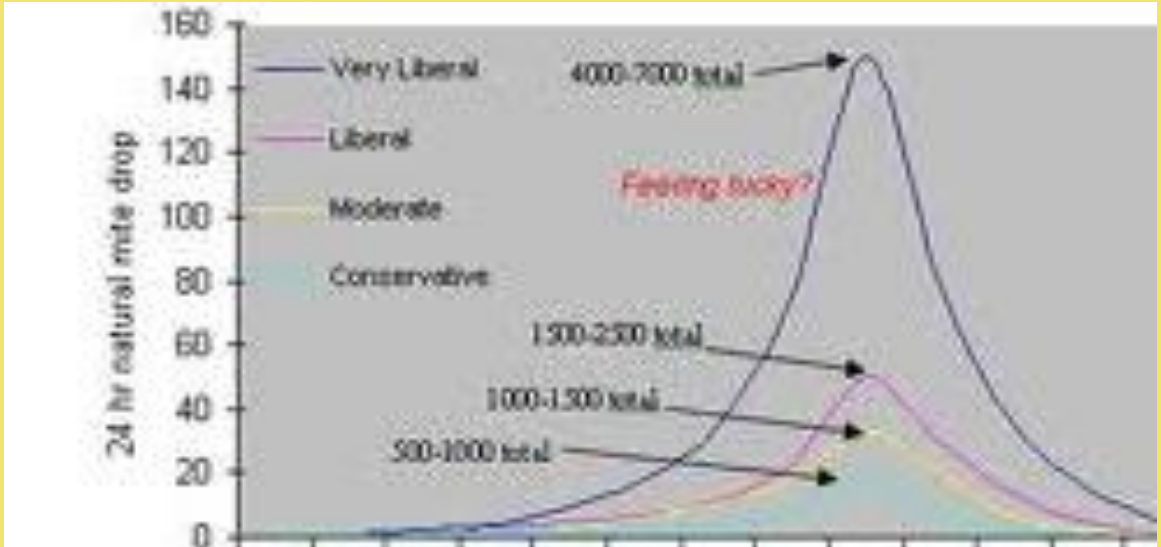
METHODS OF TESTING FOR VARROA

- Sticky board
  - Uses “Corex” sheet or sticky board with a marked grid
- Sugar shake
  - Uses powdered sugar
- Alcohol roll
  - Uses rubbing alcohol
- Ether roll
  - Uses diesel starter fluid (ether)



STICKY BOARD

Periodically, place a “sticky board” on the bottom board of a hive and leave it in for 24 hours. Then take it out and count the number of Varroa mites dropped in that period of time.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ja
Very Liberal	0.5	1	2	4	9	18	35	75	150	80	35	15	5
Liberal	0.5	0.5	1	3	5	7	12	23	50	30	13	5	0
Moderate	0.5	0.5	1	2	3	6	11	18	33	20	6	2	0
Conservative	0.5	0.5	1	2	2	3	4	7	17	7	2	1	0

MITE COUNTS

This chart provides a framework for interpreting the Varroa mite count on the sticky board in a 24 hour period. Any number in excess of your threshold indicates a need for treatment.

SUGAR SHAKE

- Place a few tablespoons of powdered sugar in a mason jar, add ¼ cup of bees and gently "slosh" the bees around until they are fully coated.
- Replace the lid with #8 hardware cloth and shake the bees down over a white sheet of paper.
- The sugar will dislodge the mites allowing them to fall through the screen.
- This will give you an average mite count for your hive.

SUGAR SHAKE

Preparing powdered sugar shake samples. Shaking out the mites onto a white surface. Shake for at least one minute.

ALCOHOL OR ETHER ROLL

- Similar in methodology to the sugar shake.
- Uses a sample of half a cup (approximately 300 bees).
- Place ½ a cup of bees in a mason jar, add ½ a cup of alcohol and gently roll the bees around until they are fully coated.
- As an alternative, spray the ½ cup of bees in the jar with diesel starter fluid (ether) and roll them around.
- Using either method, the mites will drop to the bottom of the jar.
- These differ from the sugar shake in that the bees must be killed.

ALCOHOL OR ETHER ROLL

Many in the research community, as well as state apiary inspectors, have gone to using the alcohol roll of 300 bees from the brood nest as their standard method of mite assessment. Take half a cup (roughly 300 bees) sample from eight different frames from the same colony.

WHEN TO TREAT FOR VARROA MITES (SUGGESTED)

- Sampling Method
  - Sticky board (24 hours)
    - Spring 5-10 mites
    - Fall 50-60 mites
  - Sugar shake, alcohol or ether roll
    - Spring 3-4 mites
    - Fall 10-12 mites

TRACHEAL MITES

Microscopic mites found in the trachea of a honey bee. Detectable only under high magnification after dissecting the bee. Although they were a major problem in the 1980s, these mites are rarely found today.

WAX MOTHS

Wax moths are almost always present in a bee hive. However, they are creatures of opportunity and appear in sufficient numbers to wreak havoc only when a colony is weakened due to Varroa or other factors.

WAX MOTH LARVAE

Wax moth larva (top) and SHB larva (bottom). Although there is some size overlap between both species, the wax moth larva will grow to twice as long (2 cm) as the SHB larva. Note the "prolegs" on the wax moth larva.

WAX MOTH DAMAGE

Creatures of opportunity - they move in and wreak havoc on a colony that has been weakened by Varroa mites, or other causes, by destroying combs, burrowing into woodenware and weaving their webs. No in-hive chemical treatment is available.

SMALL HIVE BEETLE

The SHB is a fairly recent pest to be introduced to the US from Asia. The only chemical treatment approved to reduce or eliminate this pest is Coumaphos. It can be used in one special trap, the "Beetle Barn." But numerous other types of non-chemical beetle traps are available to help with the problem.

BEETLE BLASTER

The beetle trap should be filled with 25cc of vegetable oil. Do not put too much oil in the trap or it may not work effectively. About 1/4 to 1/2 inch of oil in the trap works best. The bees will chase the beetles into the trap and they will drown in the oil. Inspect frequently and replace as necessary

WEST BEETLE TRAP

This trap consist of a tray that you partially fill with a small amount of vegetable oil and a specially designed lid that is covered with almost 300 small slots. Placed on the bottom board, the SHB fall into the vegetable oil, and are coated with it, suffocate, and die. Inspect and clean trap regularly.

SMALL HIVE BEETLE LARVAE

Small hive beetle larvae (bottom) are superficially similar to those of wax moths (top). SHB larvae, however, are generally smaller, tougher, and lack the fleshy four pairs of abdominal "prolegs" found on wax moth larvae.

SMALL HIVE BEETLE DAMAGE

Evidence of a frame “slimed” by SHB larvae. They can destroy a weakened colony! The mess they leave behind is equal to or even worse than that of wax moths.

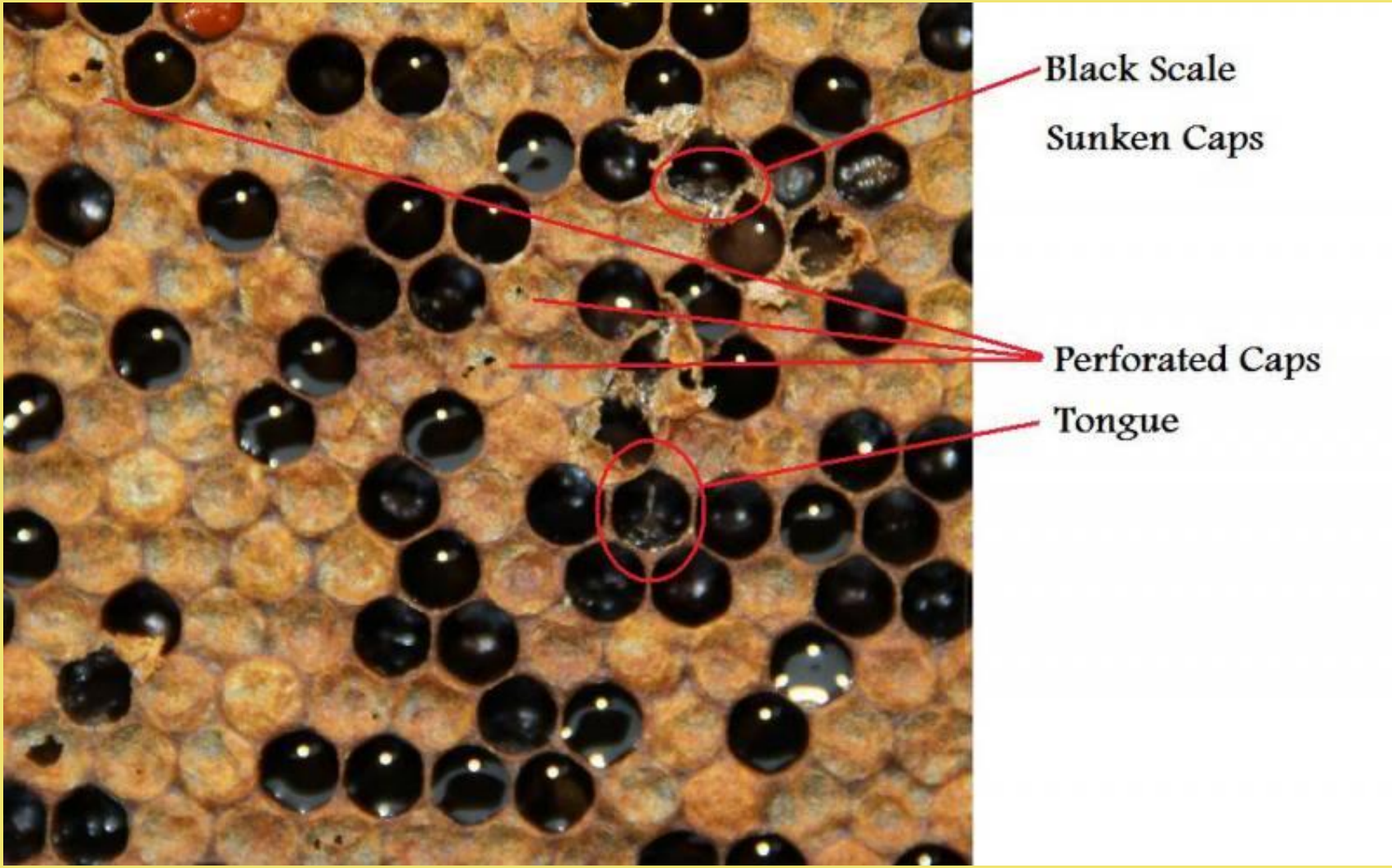
EVIDENCE OF NOSEMA

Gut disease, characterized by dysentery, resulting in bee feces appearing on the inside and/or outside of the hive.

BACTERIAL DISEASES

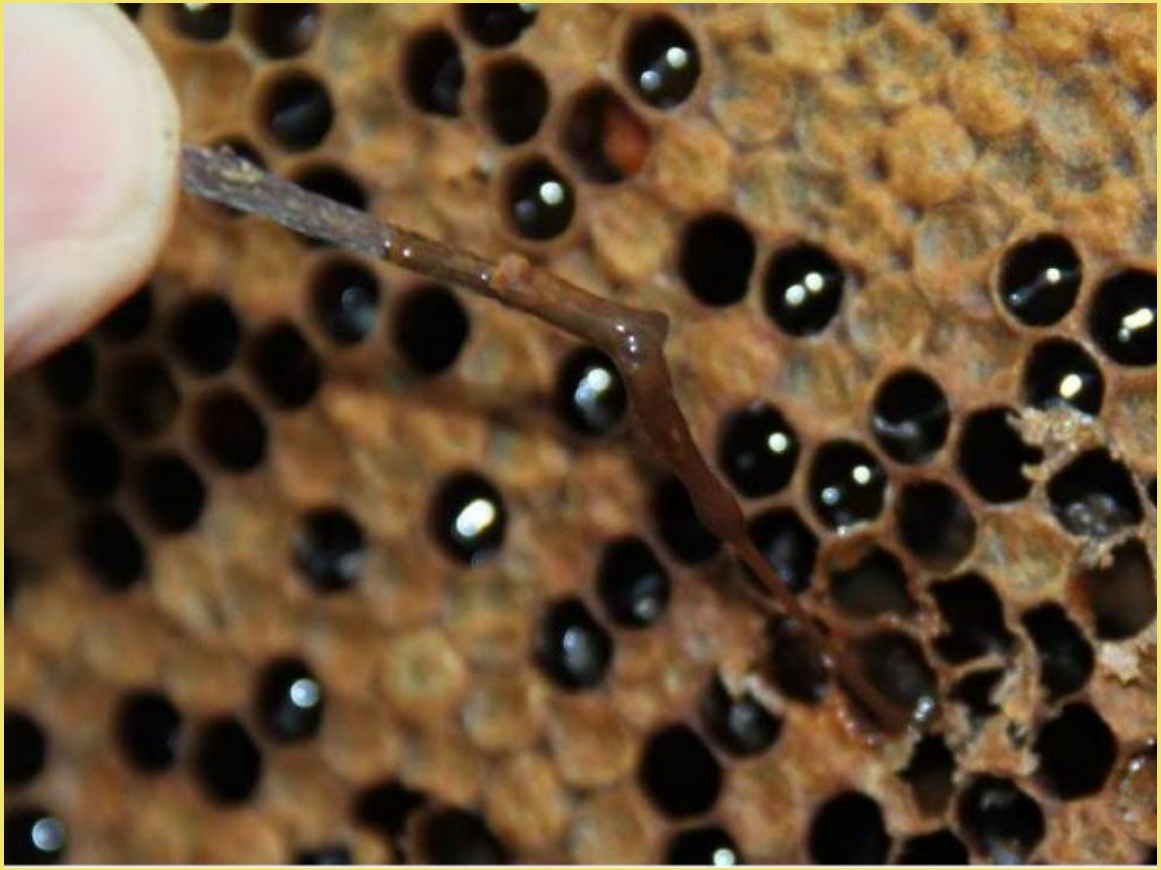
- American Foulbrood (AFB).
  - Caused by the spore-forming *Paenibacillus larvae.*
  - The most destructive of the bee brood diseases.

- European Foulbrood (EFB).
  - Caused by *Melissococcus plutonius,* a bacterium that infects the mid-gut of the bee larva.
  - Considered to be less serious than AFB.



AMERICAN FOULBROOD

Characterized by sunken and perforated cell caps, as well as collapsed dead larvae with protruding tongues. AFB also has a distinctive noxious odor.



AFB “ROPINESS” TEST

Insert a toothpick, match stem or small twig into a cell. Then stir the contents of the cell and slowly remove the gelatinous larva. If it “ropes out” you most likely have AFB.

EUROPEAN FOULBROOD (EFB)

The melted pupae in the perforated cells either have EFB bacteria or they have just been cannibalized down by hygienic bees.

VIRAL DISEASES

- Acute bee paralysis virus (ABPV) or (APV)
- Israeli acute paralysis virus (IAPV)
- Kashmir bee virus (KBV)
- Black Queen Cell Virus (BQCV)
- Cloudy Wing Virus
- Sacbrood virus (SBV)
- Chronic Bee Paralysis (“Hairless Black Syndrome”)
- Deformed Wing Virus (DWV)

VIRAL DISEASES (Cont'd)

- No vaccines or medications are available for any of the honey bee viruses.
- Therefore, good sanitation practices are a critical key to prevention.
- Comb replacement and requeening are the best practical responses to a virus infection.
- Varroa mites are known to be vectors of the viruses that cause viral illnesses.
- Hence, Varroa mite control is an essential element in maintaining a healthy colony.

PARALYSIS VIRUSES

Honey bee afflicted with a paralysis virus. Unable to fly - restricted movement. Hairless, greasy appearance, and pure black bees with no color are an indication of potential viral problems.

CLOUDY WING VIRUS

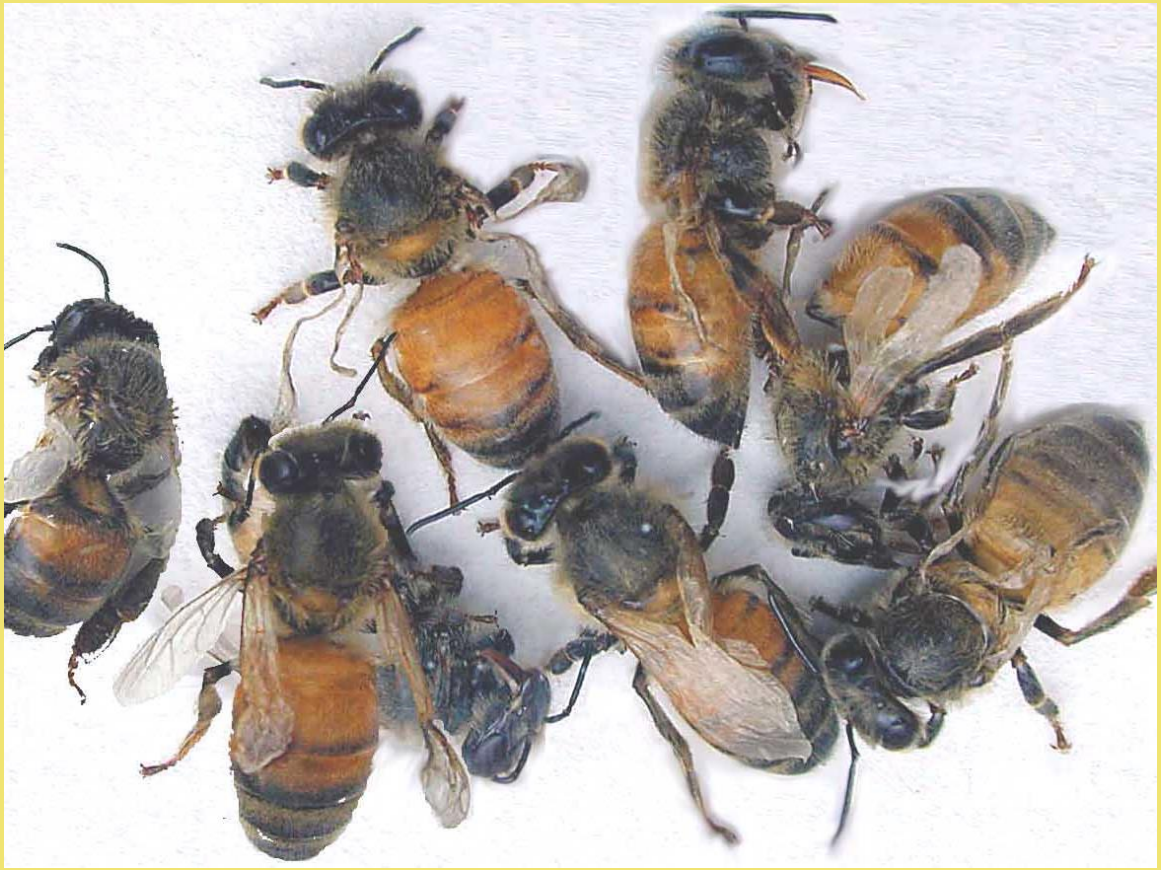
Characterized by white splotches on the wings.

SACBROOD VIRUS (SBV)

Brood is encapsulated in a leathery sack. Beekeepers rarely consider Sacbrood a serious threat, however recent estimates suggest that one larva killed by the Sacbrood virus contains enough virus to kill over one million larvae.

CHRONIC BEE PARALYSIS

Also known as “Hairless Black Syndrome.” Symptoms of chronic bee paralysis are limited to adults. Individuals exhibit an abnormal trembling motion of the wings and body. Bees appear incapable of flight and may be seen crawling up the stems of grass in front of the hive.



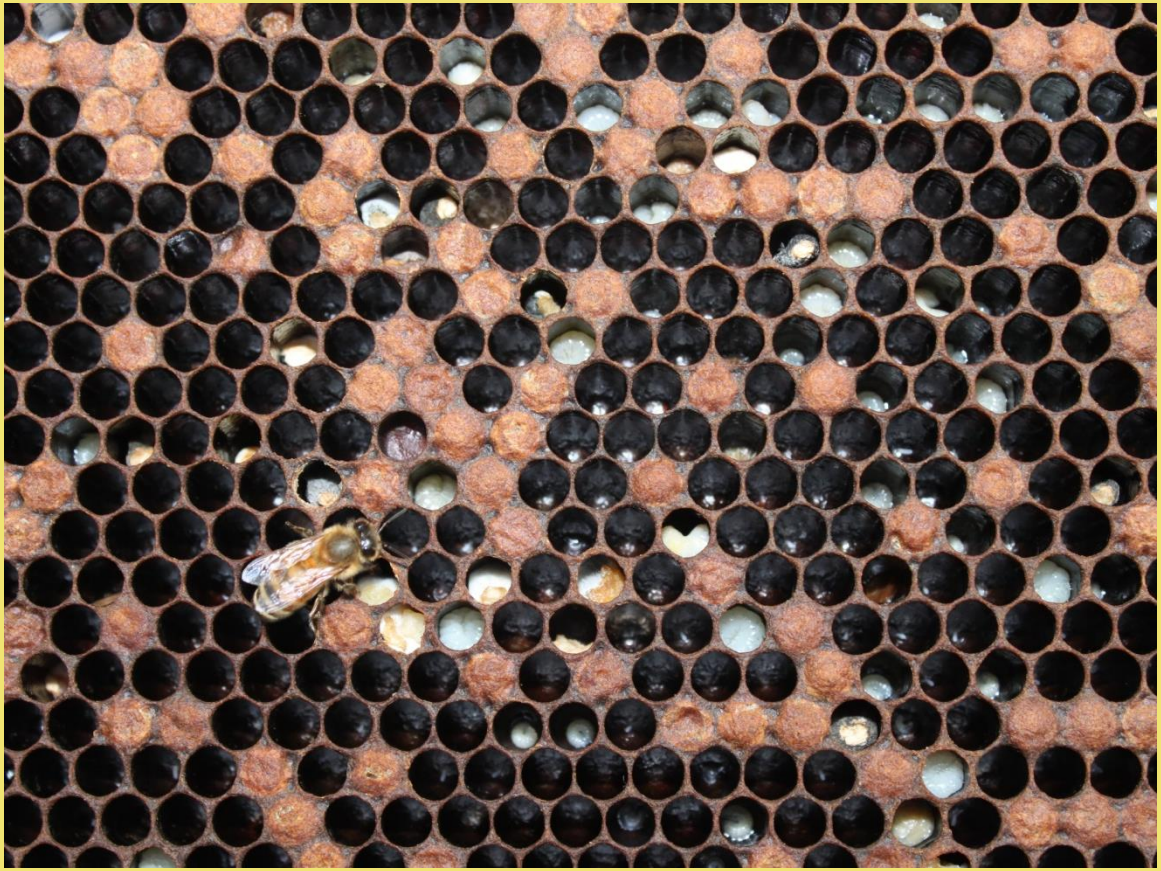
DEFORMED WING VIRUS (DWV)

Characterized by deformed and mis-shapened wings ("K-wings"). Bees are unable to fly. DWV appears to be associated with parasitic *Varroa* mites which are known to spread the virus or at least activate it.

FUNGAL DISEASES

- Chalkbrood
  - *Ascosphaera apis* is a fungal disease that infests the gut of the larvae.
  - Chalkbrood is most commonly visible during wet springs.
  - Hives with Chalkbrood can generally be recovered by increasing the ventilation through the hive.

- Stonebrood
  - Stonebrood is a fungal disease caused by Aspergillus fumigatus, Aspergillus flavus, and Aspergillus niger.
  - It causes mummification of the brood of a honey bee colony.
  - After death the larvae turn black and become difficult to crush, hence the name stonebrood.



CHALKBROOD

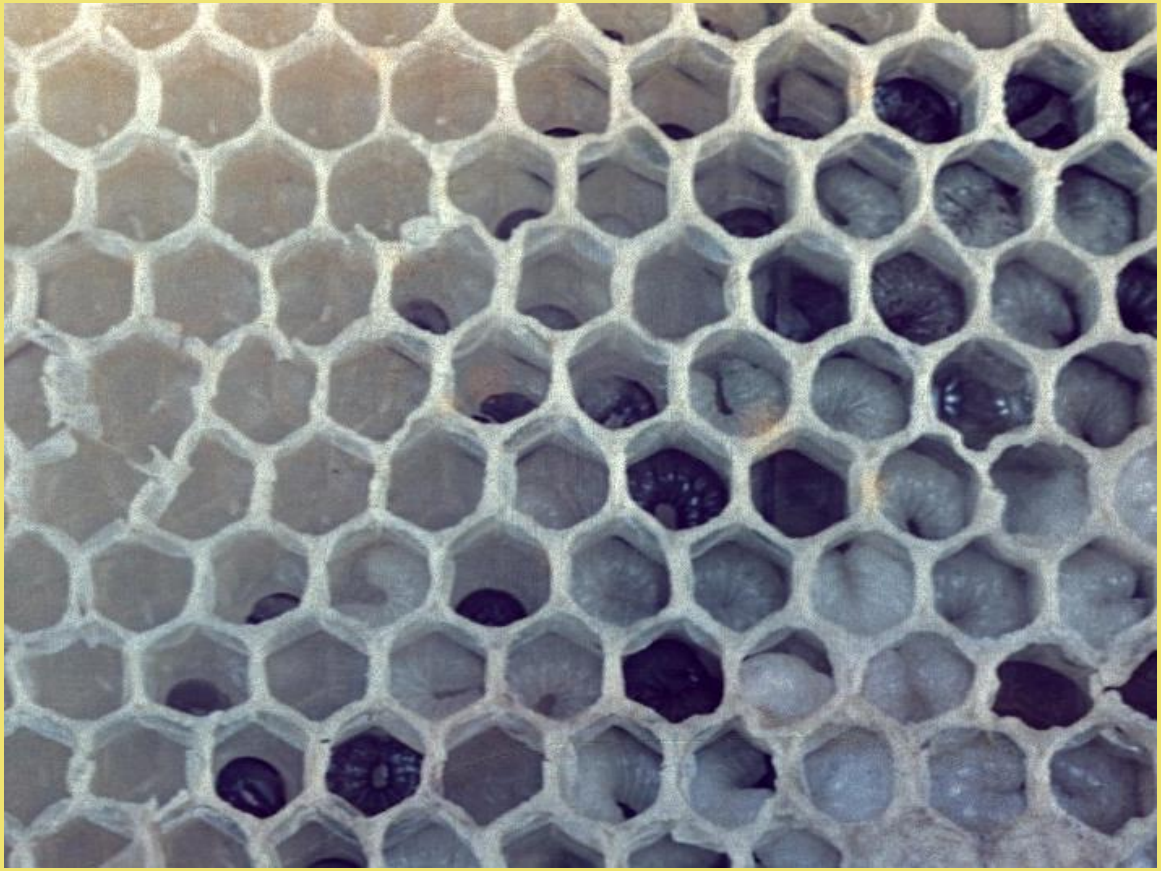
Various stages of Chalkbrood. Larvae become mummified and look like pieces of white chalk. Mummies are carried out of the hive by the bees and can be found on the ground in front of the hive.

STONEBROOD

Mummified larva that have turned black and hard. Hence their name, stonebrood. This is a very rare condition and many experts say that they have never seen a case of stonebrood.

CAUTION! - CHILLED BROOD

- Chilled brood is not actually a disease but can be a result of mistreatment of the bees by the beekeeper.
- The brood must be kept warm at all times. Nurse bees will cluster over the brood to keep it at the right temperature.
- When a beekeeper opens the hive in cold weather, and prevents the nurse bees from clustering on the frame for too long, the brood can become chilled, deforming or even killing some of the bees.
- To minimize the risk of chilled brood, open the hive only on warm days (55^{o} and above), or when the bees are flying.
- Learn to inspect your hive as quickly as possible and put frames with brood back in the brood box where the bees can cluster on it immediately.



CHILLED BROOD

This condition is totally the fault of a careless beekeeper! Never open a hive below 55 degrees Fahrenheit and then don’t leave it open long unless it is 75 degrees or warmer.

NOW YOU KNOW WHAT TO LOOK FOR

- Identify existing or potential problems in the hive through your observations.
- Use the internet (but be careful of YouTube videos), books and other resources to research the problem and to find solutions.
- Consult with experienced beekeepers in your local and state beekeeper associations.
- Act promptly to implement whatever treatment and/or remediation is indicated.

ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES

- Register your colonies - only $4.00 annually for 1-9 colonies and $8.00 for 10-24 colonies!
- Go to www.agi.alabama.gov and click on the "Forms" tab, then "Plant Health Forms," then "Honey Bee App" to get the form.
- Get free hive inspections in your bee yard by state apiary inspectors.
- To request a hive inspection, call the State Apiarist's office at (334) 240-7225.

PROPER SUMMERTIME BEEKEEPING ATTIRE

Don’t forget to wear protective clothing. ☺ Always wear a veil!

Thanks for your time and attention.

Any questions?

Contact me:

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