Reading a Hive of Honey Bees

By

Dana Stahlman

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Thank you for the invitation to speak to you this evening.

I would like to dedicate this talk to Billy Engle of The Rock, Georgia.

Billy and I were business partners and friends. His passing has left a void in my heart.

Many of you know Billy and have worked with him and B.J. I owe a lot to these two gentlemen.

Billy said, “Beekeeping is like jumping out of an airplane with an anvil tied to your leg.”

On more than one occasion both B.J. and I have jumped out of that airplane with Billy.

He served his country as a paratrooper and knew what that meant. Rest in Peace, Billy.

To Begin Tonight, I would like to ask a favor!

I like to take questions from the floor. Sometimes I get questions and sometimes I get few willing to ask questions.

I have found that if I handed out 3x5 cards and offered a prize to those willing to come up with questions were more willing to get involved. Each person turning in a 3 X 5 card will get a number and later, we will draw a number for the person who will win a Beekeeping 101 Book and a CD called Beekeeping 101, 201, & 301.

If you want to contact me at some time, you can also put your email below your question. I answer all email questions.

- Many of these question keep me in touch with issues that you may have and are more important than any thing I can do to keep current with the vast amount of information coming out about honey bees every day.

- A question and answer session will follow the powerpoint presentation.

A sample of the types of questions beekeepers have asked

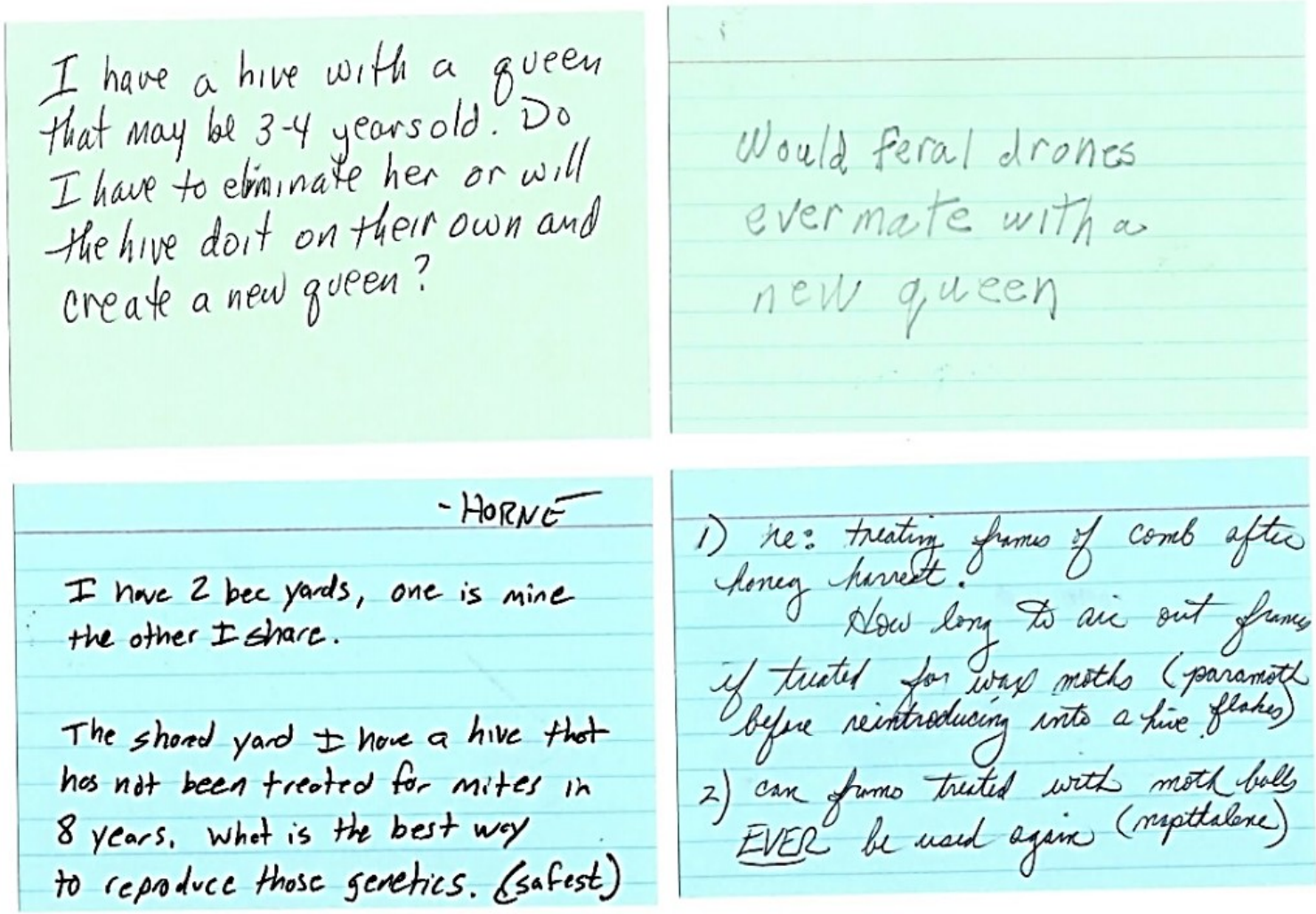
There is no such thing as a stupid question!

One of the valuable reasons for belonging to a bee club is the ability to seek information about what you could do and how you can do it with your hives of bees.

My talk is on "Reading a hive of honey bees"

Many beekeepers may look at a hive of bees but have to learn to see the details of what the bees are doing. That is something books can not teach – actual hands on observation of honey bees in action is a real teaching situation. I hope I can share just a little information with you. I can learn from you just as you might learn something from me.

Real questions from beekeepers like yourself



Reading a hive of bees

If you are a new beekeeper, I want you to realize that it fun to keep honey bees.

So many new beekeepers are entering the beekeeping world. So much is available to study and the internet is alive with beekeeping blogs.

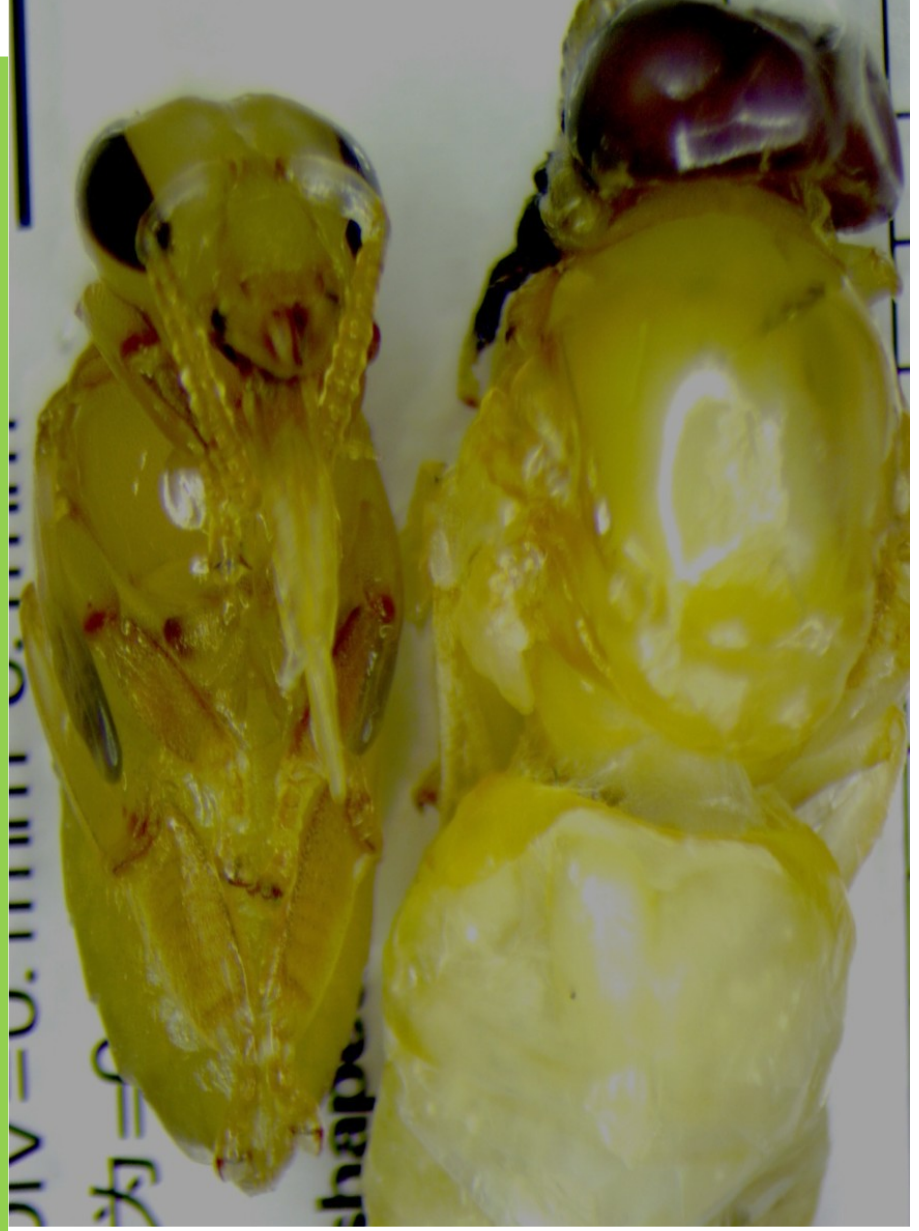
That leaves the question of what is one to believe in all the published information on the web?

I will try to provide some photographs that will illustrate some fundamental principals in beekeeping.

This is a micro photo of two inhabitants of your hive.

You usually don't see these honey bees because they are capped over and hidden from view.

But if you separate boxes and the bees have built comb between the boxes you may see capped pupa Exposed.



White pupae and larvae is good.

Anytime you see discolored brood a problem exist in the hive.

Reading a hive of bees.

Regardless of the kind of hive/hives you own, you can not inspect a hive by just looking at it.

These are standard Langstroth size hives. They are bit unusual – they are made of plastic. Most equipment sold is made of wood. It really doesn't make much difference to the bees if it is a painted box or not. Plastic is becoming more and more common in bee appliances.

check for anything unusual.

1) Are bees leaving and entering the hive?
2) Are there any dead bees on the ground in front of the hive entrance?
3) Problems with skunks, chalkbrood, or chemical kill can often be seen at the entrance to a hive without opening it.

You might notice that my hives are a bit unusual. Since selling my bee business, I have started over with all new equipment. I checked out some of the new equipment available. I rejected the flow hive! I saw some potential in researching the **Technoset** polypropylene plastic beehive. It is based on the **Langstroth Design**. I am currently writing about my use of it and studying its virtues and faults. It does have some advantages but some serious drawbacks as well.

These pictures hopefully are not something you see in your bee yard.

Opening the hive

When you open a hive, the mystery of the hive is revealed.

Often only a quick examination is needed.

1) **If you saw no problems at the entrance, the object is to read what the bees tell you is going on inside the hive.**
2) **Experienced beekeepers can usually detect a problem by examining only a few frames from a hive. There is no need to remove all frames in a hive.**
3) **So here are a few clues you can pick up from experienced beekeepers and what they look for! I would invite anyone in the group to share anything I don't bring up tonight. We learn from each other no matter how many years we have been keeping bees.**

The inner cover

In this era of the hive beetle, one can spot them often hiding from the bees. They escape to the inner cover. I have read that the bees actually corral them to certain areas of the hive.

- Hive beetles are a pest that thrive in weak hives. This also applies to wax moth. Both are considered pest and can be controlled to a certain extent with proper bee management techniques.

Fortunately both of them can be seen by visual examination. Both have a larval stage. The worm stage allows us to see them at work damaging the comb within the hive. Both can do a lot of damage if inspections are not done in a timely manner.

An open hive allows the beekeeper to examine bee conditions

The examination should include:

1) Evaluate the hive for the expected growth in bee population.
2) Determine the laying capacity of the new queen.
3) If a queen problem exist, it is important to replace the queen ASAP. The following slides will show some of the new hive issues and actions a beekeeper needs to make to save the new hive.
4) Check for disease and mites and other problems.

Expected Population Growth of the new hive

If you start a new hive with a package of bees, count on approximately four to five weeks for the bee population to begin to grow. During that time the bees that came in the package will have done much to prepare the colony for survival.

If installed on new foundation, it will take them some time to draw the foundation on the new frames.

A new box must be added eventually to provide room for expansion of the hive population.

This photo shows that the bees are in the hive and adjusted to working on the frames.

This is a critical period for a newly established hive of bees. No extra box needs to be added at this stage of development and there seems to be a good population of bees.

To read a hive it is necessary to remove some of the frames.

It is important to inspect a new hive more often than an established hive. During this critical time the beekeeper must be looking for:

1) Has the queen been accepted?
2) Is the queen laying a good brood pattern?
3) Are the bees drawing the foundation correctly?
4) Do they have enough food?

[It is not necessary to find the queen each time you examine a hive!]

• Inspecting a frame

It is best to hold the frame firmly with both hands. The sun or light source should be from over the back of the beekeeper. Thus, light can reach the bottom of each cell in the comb. This is what newly drawn comb should look like.

But the bee population is small and the bees are older bees.

But right away there is a problem.

Bee populations are important for a hive of bees survival.

We are going to look at several slides with issues that will determine the success or failure of a hive.

Just remember that a queen – a good queen can lay between 1500 to 2000 eggs in one day.

If a queen lays 1500 eggs a day and enough bees in a hive can care for feeding and keeping hive temperatures near 92 degrees, a hive will progress very rapidly.

If the beekeeper fails to recognize a problem early on in a hive's development, not much can be done to save the hive.

Six weeks after installing a package of bees into a hive, this is what I saw when I opened the hive and examined a frame. The beekeeper told me he was feeding the hive and it had eggs but would I come over and look at it.

First : Has the new queen been accepted.

Let's suppose you can not find the queen. And even if you do find the queen – further checking is required.

Problems with queens are:

1) The bees do not accept the queen given to them when the new queen is introduced to the bees in the package.
2) No eggs and brood indicate a problem within several days after the queen is released from her cage. But after several weeks – some say 20 days or so, a worker bee will develop the ability to lay unfertilized eggs. Several ways to identify this situation include:

Multiple eggs in each cell as shown here. Not a good situation for any hive.

Brood with laying workers

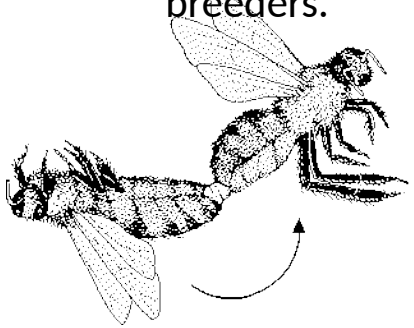
Lets assume you see the queen.

Another problem possible with the queen you get with a package of bees is that she is a virgin queen. That means she has not mated with a drone. It is possible that she might still get mated but she might also become a drone laying queen.

On the first inspection of the hive after she is released, you may see eggs at the bottom of cells. Most of us would think everything is okay – in fact, most books will indicate that eggs means the queen is laying. But if what she is laying are unfertilized eggs, the result will be drone brood produced – Not worker brood.

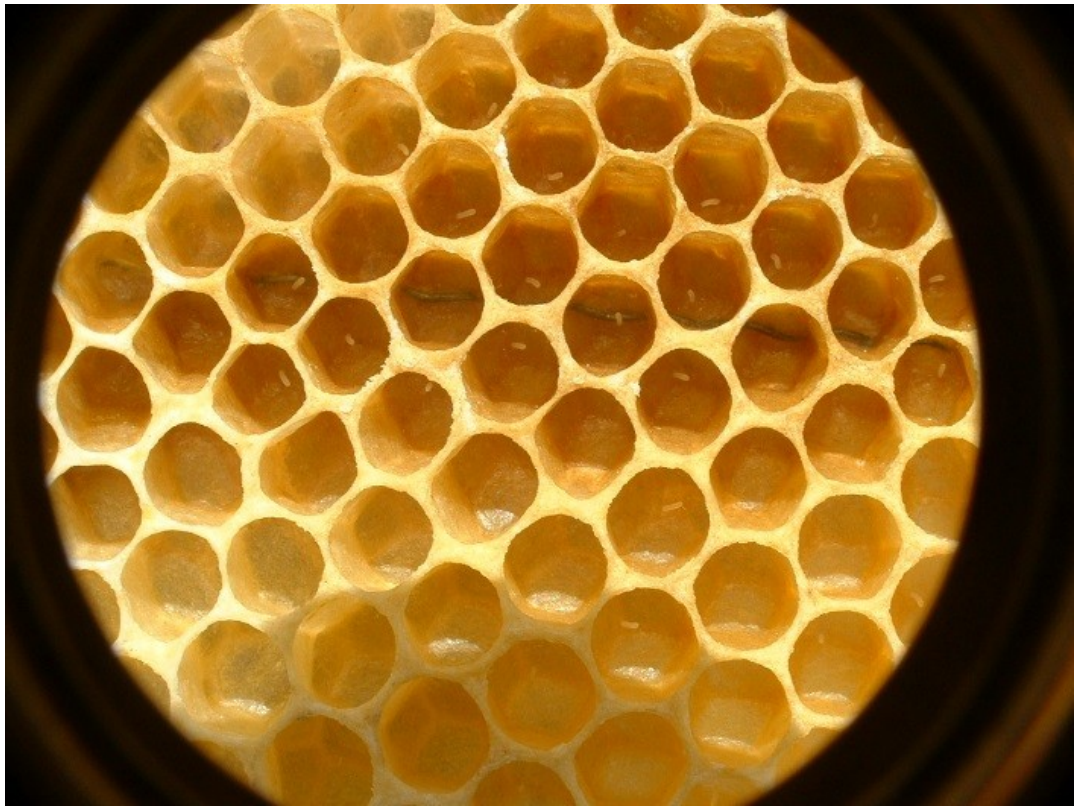
And another problem with the queen

Many early queens produced for the package bee industry are poorly mated. Each new virgin queen will mate from 12 to 20 times. The result is the drone mating with the queen dies in the process. If the early spring has been cold or wet delaying drone brood development, the result will put greater pressure on good mating results for queen breeders.



This is a queen cell. It was found in a colony of bees with a queen and almost no eggs. The hive had been started according to the beekeeper about two weeks earlier.

What you should be seeing if the queen is accepted.

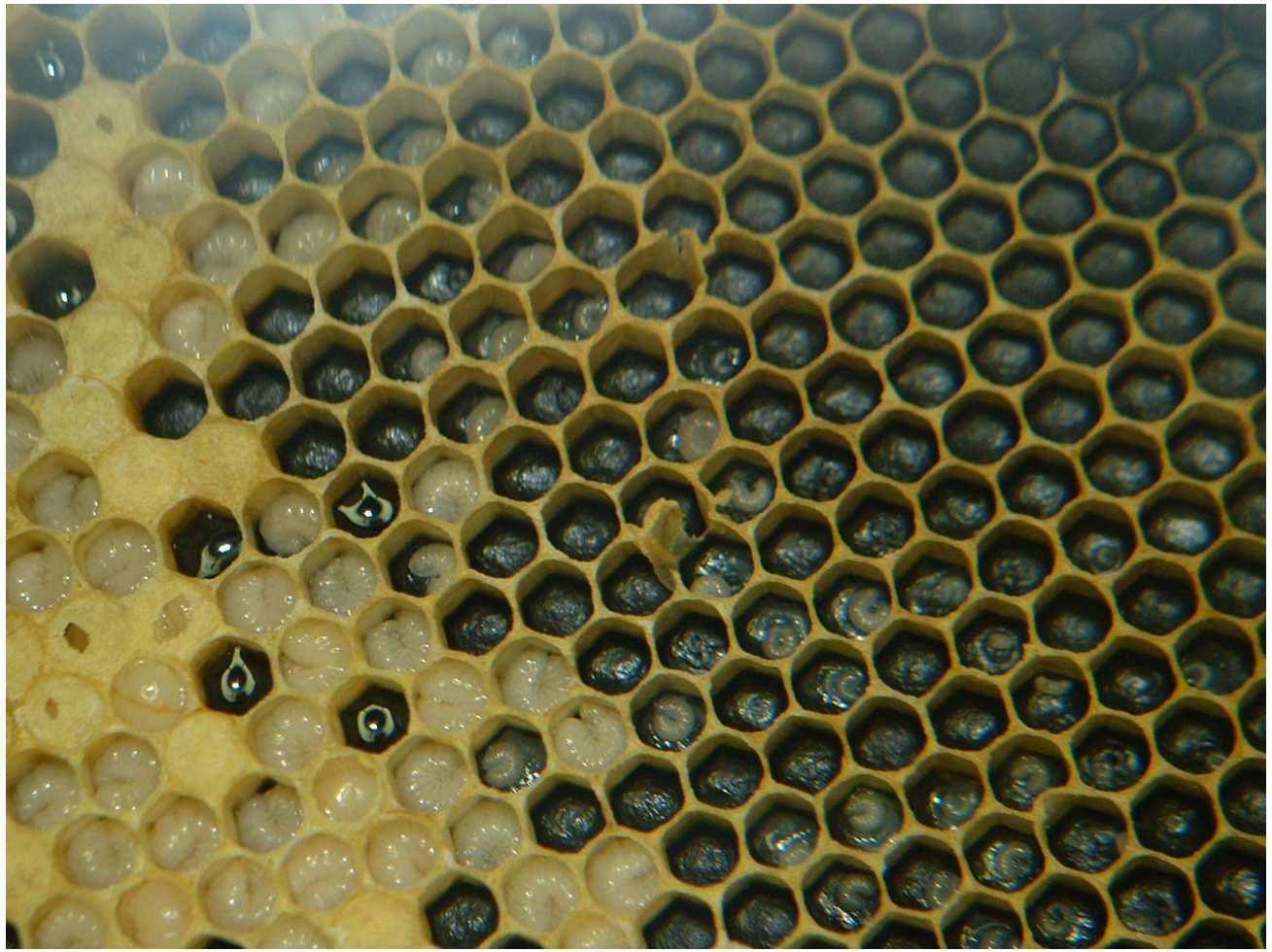


One of the hardest things about looking into cells is seeing eggs. They are very small.
After the queen has started laying, one should see young bees emerging from capped worker cells.
Capped worker cells are smaller than drone cells.

This is what we want to see

This is what we want to see – brood in all stages from eggs to cells being capped.

This is new comb built on black plastic foundation. Note how easy it is to see small larva in the bottom of the cells.



What follows are slides of various pictures covering various beekeeping issues.

What is wrong with queens today?

Major issues:

Poor mating
Lack ability to resist disease
Often are superceded.
Queen are commercially raised with low standards.
Not accepted by bees they are introduced to.
Closely inbred lines -- Breeders must constantly supply new genetic stock to lines they produce.

A comment on plastic foundation – This is not something you want to see. But the queen is laying and the bees are building wax. This is an equipment problem.

I use plastic foundation. It has various advantages if used properly.

However, it requires special techniques to get the bees to draw foundation correctly

The biggest mistake is to use only 9 frames to get the frames started. 10 frames are required and they are drawn better if they are waxed. You can buy them waxed or un-waxed.

If you have drawn comb frames, placing a plastic frame between two drawn frames works wonders.

Wax frames can be recycled – used over and over by scraping old wax from the foundation and re-waxing the base foundation.

This frame is being drawn out correctly. This is something to check out very early in a hives development.

should be well filled with brood.

This is what you would find in a hive later in the season.

A strong laying queen. Bees storing nectar for future use. Brood in various stages – eggs, larva, and capped worker brood.

Note: the new frame wood becomes darkened. Older frames turn very dark. Wax is almost white – lemon yellow when first constructed and turns dark as well with age.

A problem which can be managed if caught early.

A critical natural law of honey bee wax comb construction is that the comb is constructed from the top down vertical to the ground.

L.L. Langstroth became famous because he designed a bee hive that recognized something called a “bee space.” The space is the distance between naturally built comb and its surroundings. The space will allow two bees back to back to pass between the comb surface. This space is determined to be 1/4 to 3/8 of an inch.

If this space is violated by the beekeeper, the bees will fill the empty space in the hive with comb. This comb is often referred to as brace comb, burr comb, or bridge comb.

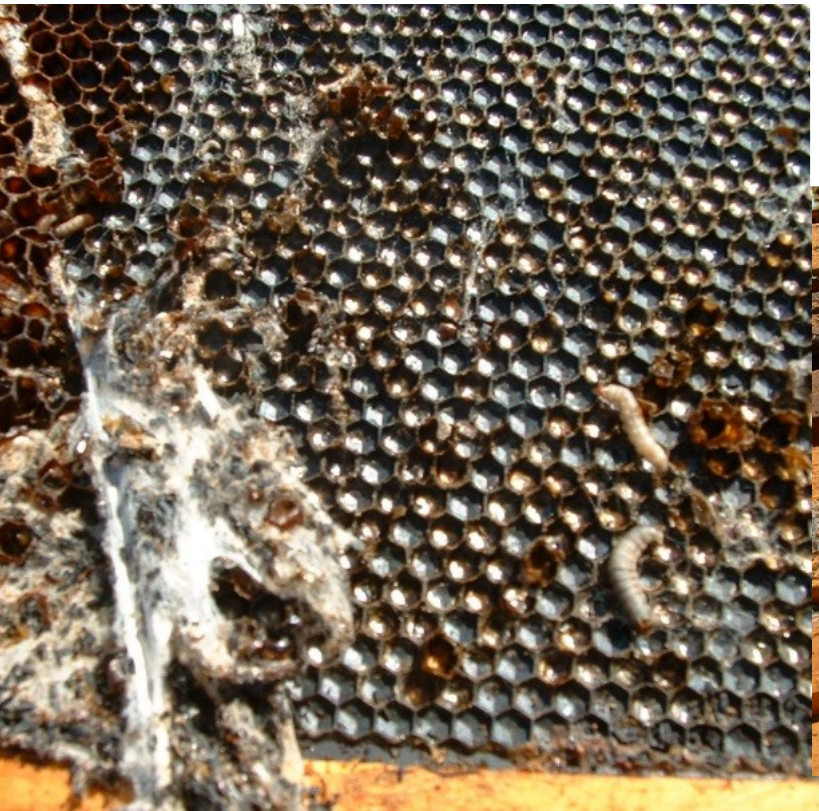
A space between frames the bees are filling with a sheet of comb extending down into the space. At one time the queen cage was placed in this space but frames were never moved back to reduce the normal bee space.

Worker bees have wax glands. They use the foundation as a guide to build straight comb. However, if frames are spaced too far apart the bees will fill the empty space with comb of their own design.

Several minor pest to check for… if they are present, it indicates the potential that the hive is in some kind of trouble.

Wax Moth

For wax moth to do this, a hive must already have a problem. The moths do not kill the hive they just take it over because the hive is too weak to resist them.



Another pest that can make a mess of a hive – bees unlikely strong enough to control them.

Small Hive Beetle

The adult beetle is the first indication that you possibly have an infestation. They sometimes get into hives as they hitch hike with bees shook into package bees.
Adult beetles can also migrate from hive to hive.

They are considered a minor pest but cause excessive damage after bee colonies have already become stressed or weakened by other factors.
Infestations of beetles can put significant stress on bee colonies already stressed with mites.

collapse and die. Often discovered too late.

Varroa Mites

A major honey bee pest!

Every beekeeper should know how to check and evaluate a hive for the presence of the mite. Most often they are completely over looked.

What to look for is illustrated in the following photographs.

- Someone compared the size of this mite on the back of a honey bees as you walking around with a watermelon on your back.

A sticky board mite fall using the Dr. Amrine formic acid treatment to discover the presence of Varroa mites.

What to look for:

This is a typical honey bee from a hive with a large mite population. Varroa mites reproduce in the cell along with a young larva and feed on it in the pupa stage.

This weakens the bee and often results in the lack of wing formation which is the last stage of honey bee development.

Do not expect a hive with deformed wing honey bees to survive for long. The collapse usually happens within weeks.

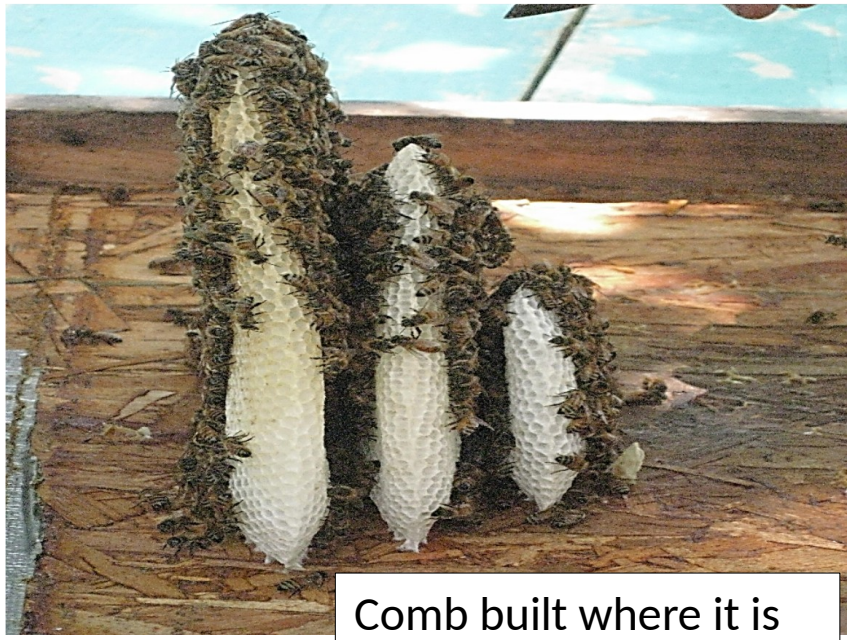
<u>This is why it is important to check a colony for Varroa mite infestation early in the season.</u> If the beekeeper waits, the bees going into winter are going to be seriously challenged. 44% of bees in the U.S. died in 2015. Most colony deaths were attributed to Varroa Mites.

Varroa mite populations explode later in the bee season while honey bee populations decline from mid summer toward fall. The result is a stressed hive with weak bees and other factors that could cause the hive to die. This opens the door to wax moth and African hive beetles.

Swarming issues

Hive inspections should be checking now for signs of queen cells. Congestion in the bee hive leads to swarming. Add supers to give the bees more room early. By the time bees build all this burr comb above top bars – a chance to get new foundation drawn and stop the swarming impulse has been lost.

Pictures -- comments

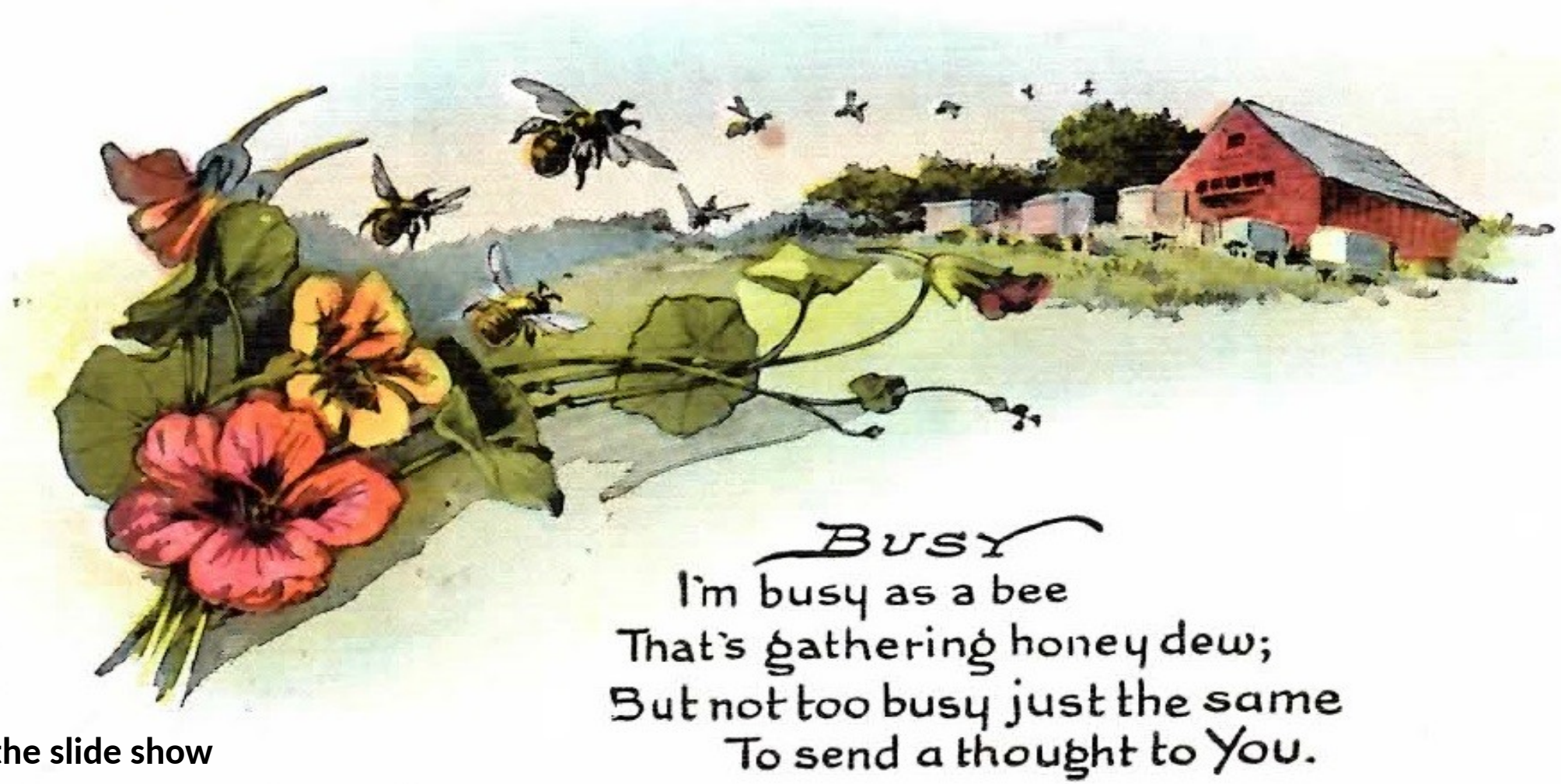


Comb built where it is not wanted. A management problem.

A frame from a hive that has died: A new beekeeper asked me if a frame like this should be destroyed?

American foulbrood

Aggressive bees



The End of the slide show

If there were questions on cards, I can take some time to answer most of them. I always feel that 30 frames of a slide show should cover a topic and still not put the audience to sleep.

Time for a bee meetings is limited, so if you put an email address to your question and I don't get to it, expect me to answer it within the next few days by email back to you.