Varroa Mite Management and Diseases

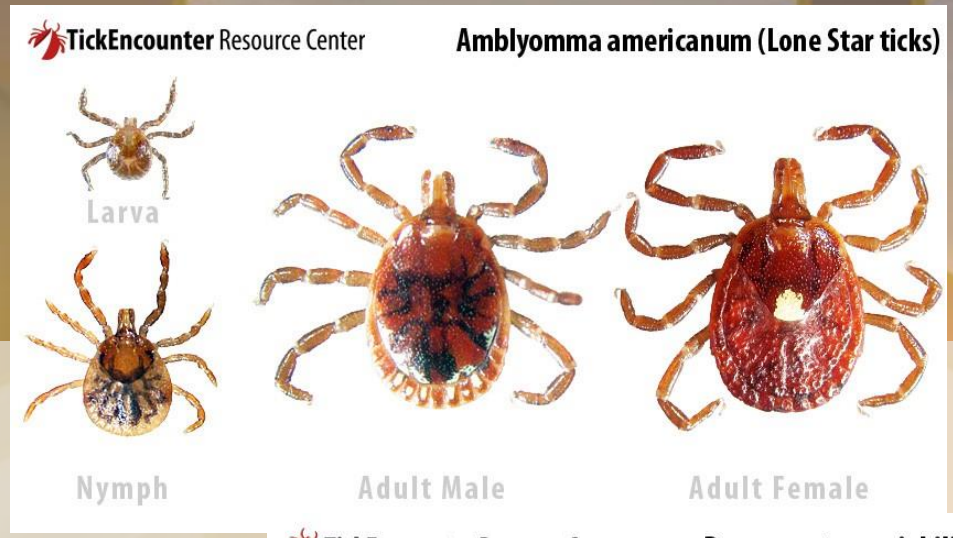
Joli Winer

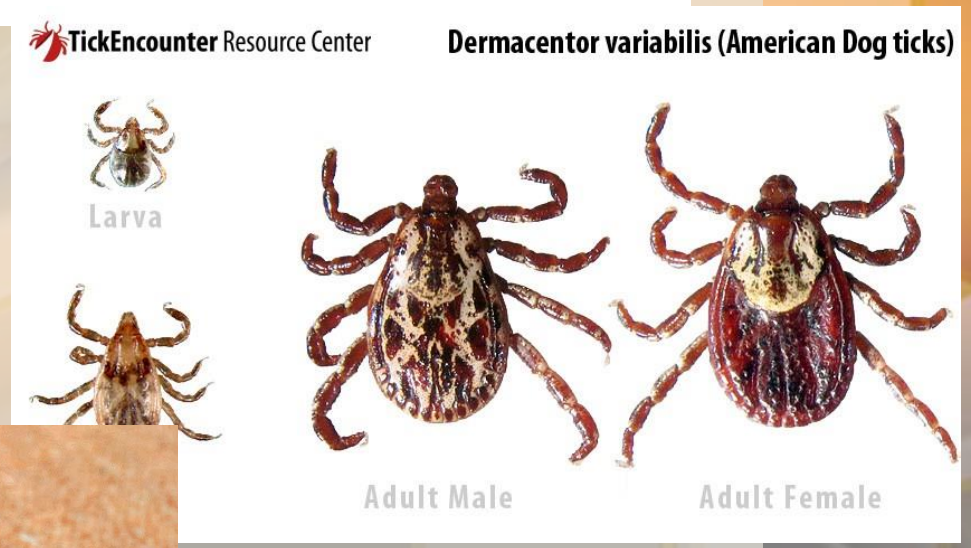
If you have bees, you have varroa mites! Know your enemy!

Ticks that bother beekeepers

- Tick Checks
- Personal Spray- with Deet
- Clothing soaked in Permethrin
- Keep areas mowed
- Pull sock up over jeans or bee suits or have a way to ties off pan
- Remove ticks within 14 hours
- Fever, Chills, Sensitive to touch, joint pain, rash

- Ehrlichiosis
- Alpha-Gal Syndrome
- Rocky Mountain Spotted Fever
- Lyme
- Tularemia
- American Dog Tick Paraly
- Anaplasmosis





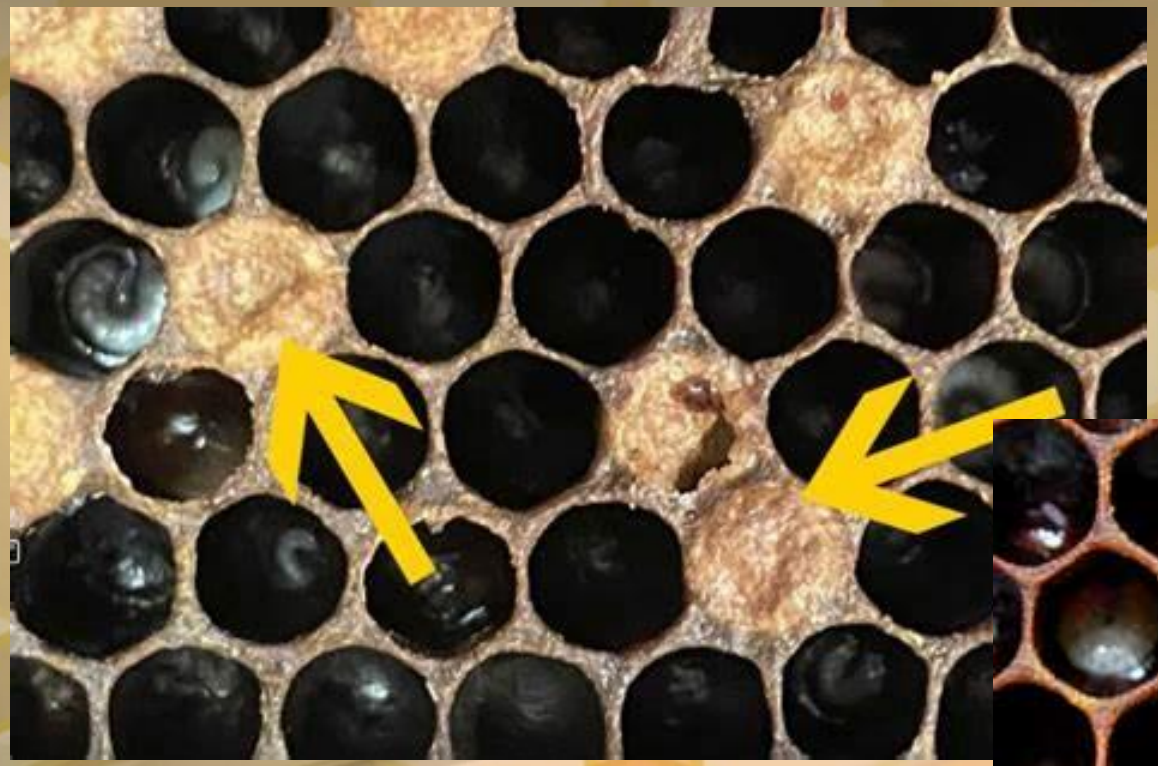
Healthy Brood

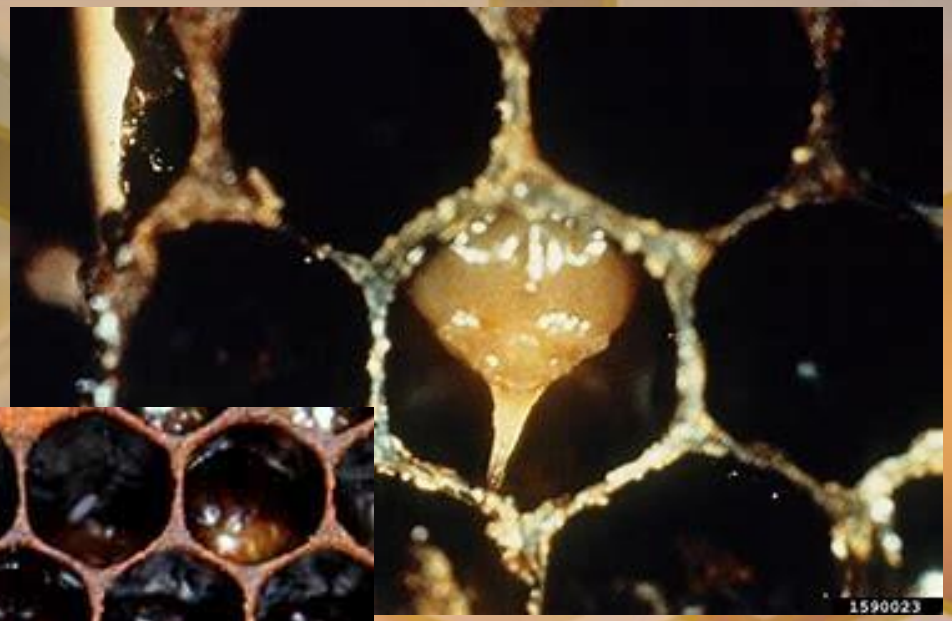
- Bee Brood inspection is good bee stewardship
- Get in the habit of looking for the unusual
- Cell cappings- uniform, light brown
- Convex-higher in the middle

American Foulbrood (AFB)

- Caused by bacterium Paenibacillus larvae
- Spore forming bacterium-2.5 billion spores – live for decades
- Infects newborn up to 2-day old larvae
- Kills the older sealed larvae or young pupae
- Does not affect adult bees

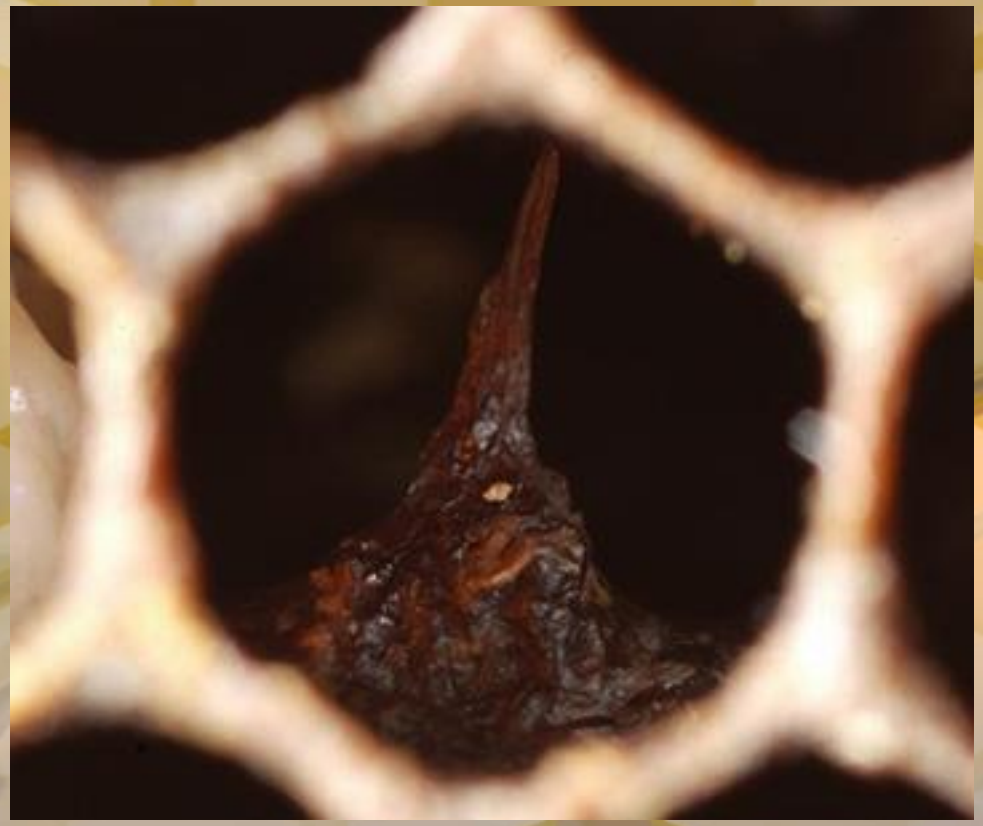
Sunken cappings, pupal tongue.

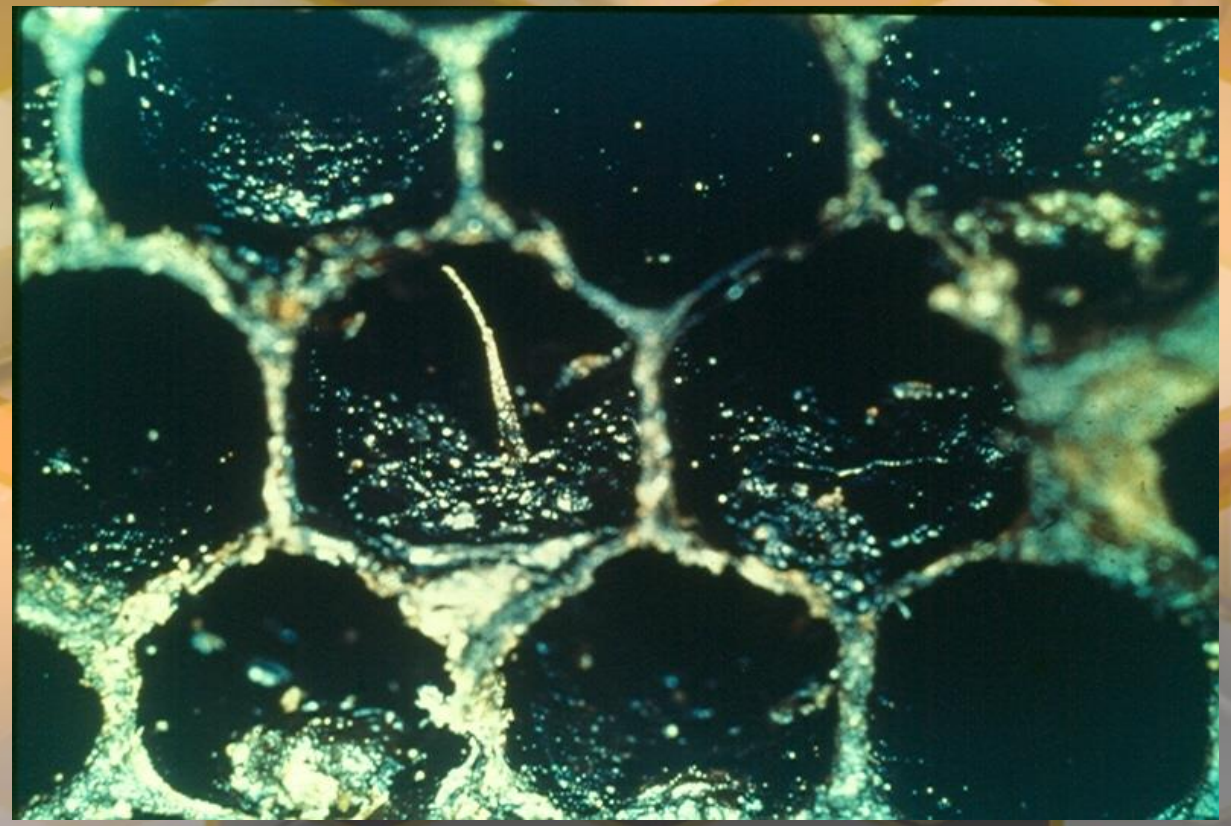




Dead Larvae and ropiness test

Used equipment – look for this &





Treatment

- Terramycin
- Tylan

European Foulbrood (EFB)

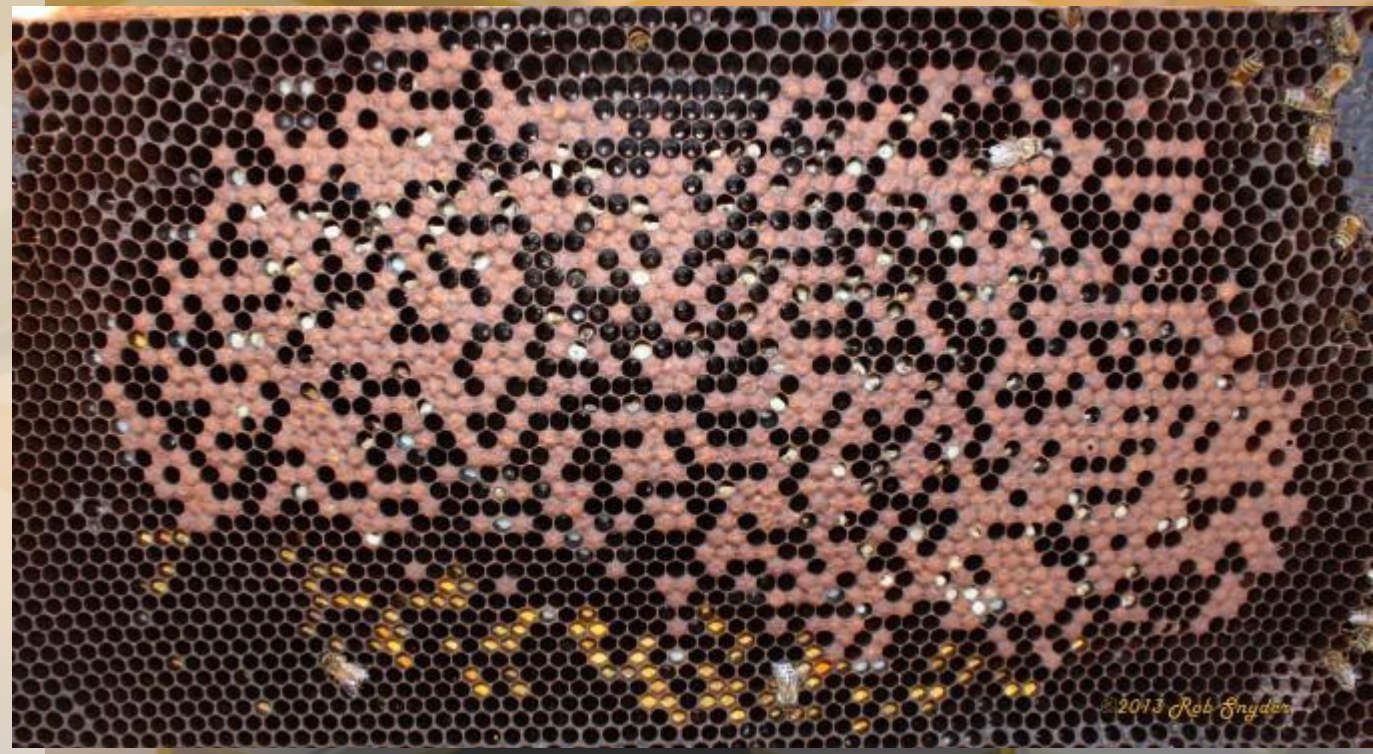
- **Not nearly as serious as AFB but more prevalent**
- A non-spore forming bacterial disease – Melissococcus plutonius
- Twisted discolored larvae
- Yellow to brown larvae
- Sunken cappings
- Remains easily removed with tweezers

What to do?

- Usually, it will clear up by itself
- Terramycin can help, Tylan will not
- Replace old comb
- A break in the brood cycle (via requeening or caging the queen) helps the bees to clear the brood nest area of remaining bacterial contamination.
- Feeding sugar syrup can also stimulate the colony to outgrow the disease.
- VFD

Parasitic Mite Brood Syndrome

- Bee parasitic mite syndrome (BPMS) also known as crud, is a complex of symptoms associated with varroa mites, viruses, or a combination of both. Brood combs of affected colonies show uncapped pupae, some with their heads chewed off; sunken, snot-like larvae; workers with deformed wings; and a high mite load. The adult population of bees is also generally small and dwindling.



What to do:

- Replace comb
- Don’t share that honey and pollen
- Treat for mites
- Do pre and post tests for varroa

Chalkbrood

- Caused by the fungus Ascosphaera apis.
- Fungal mycelia overtake the larvae

and fill the cell

Looks like chalk

Housecleaning bees carry them out

Weakens and slows build up

Found during cool damp weather

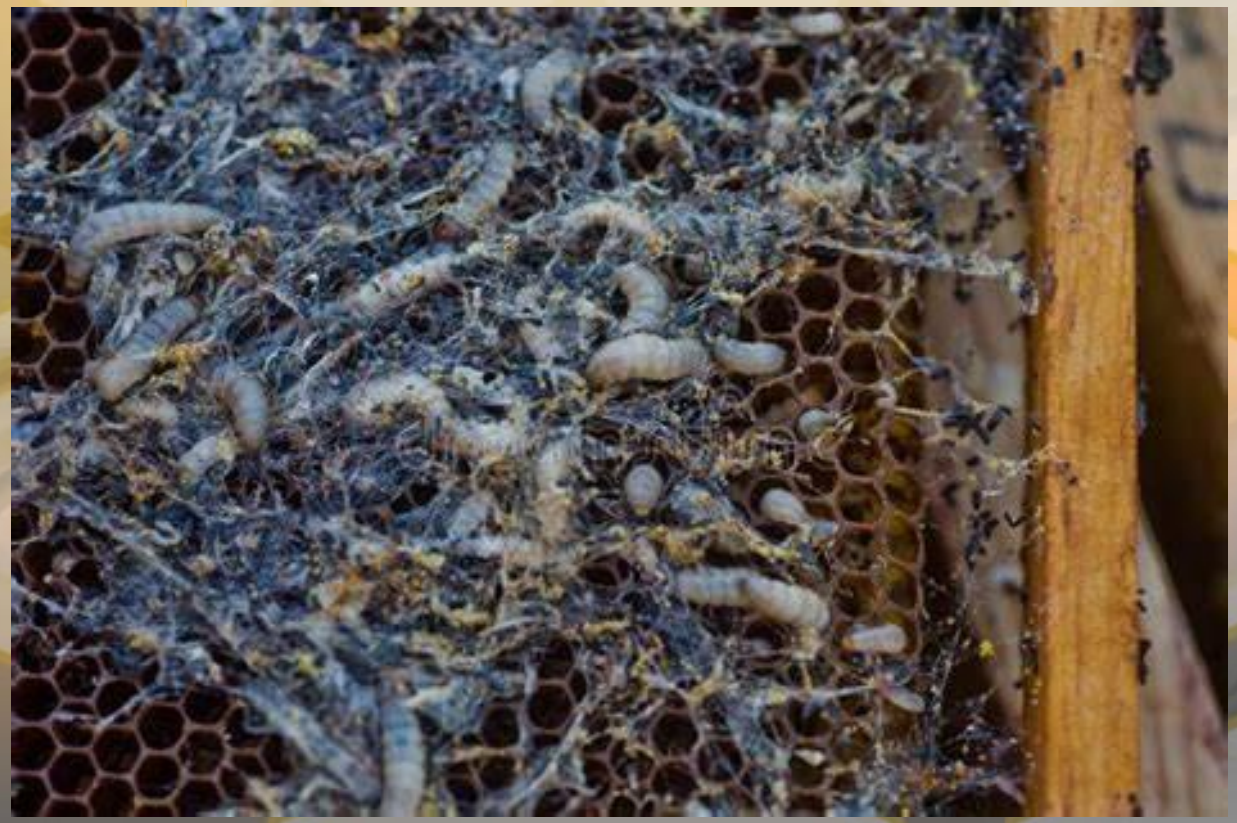
No treatment, full sun, requeen, replace old comb, Usually clears up

Wax Moth

- Caterpillars feed on the beeswax combs
- Cast larval skins
- Pollen and honey
- Cause webbing and debris

Control- Wax moths don't kill colonies

- Use queen excluders for supers
- Keep healthy hives and strong populations
- Store comb with paradichlorobenzene or PDB



Small Hive Beetle

- Disgusting- eat everything – pollen, honey, dead adult bees, combs
- Cause honey to ferment and run out of combs
- Affects weak colonies or strong colonies

Control

- Keep strong queenright colonies
- Don’t add more supers or hive bodies than th can care for
- Remove dead colonies
- Keep bees in full sun
- If feeding pollen patties, feed small amounts
- Extract with 2-3 days
- Keep a sharp hive tool
- SHB traps

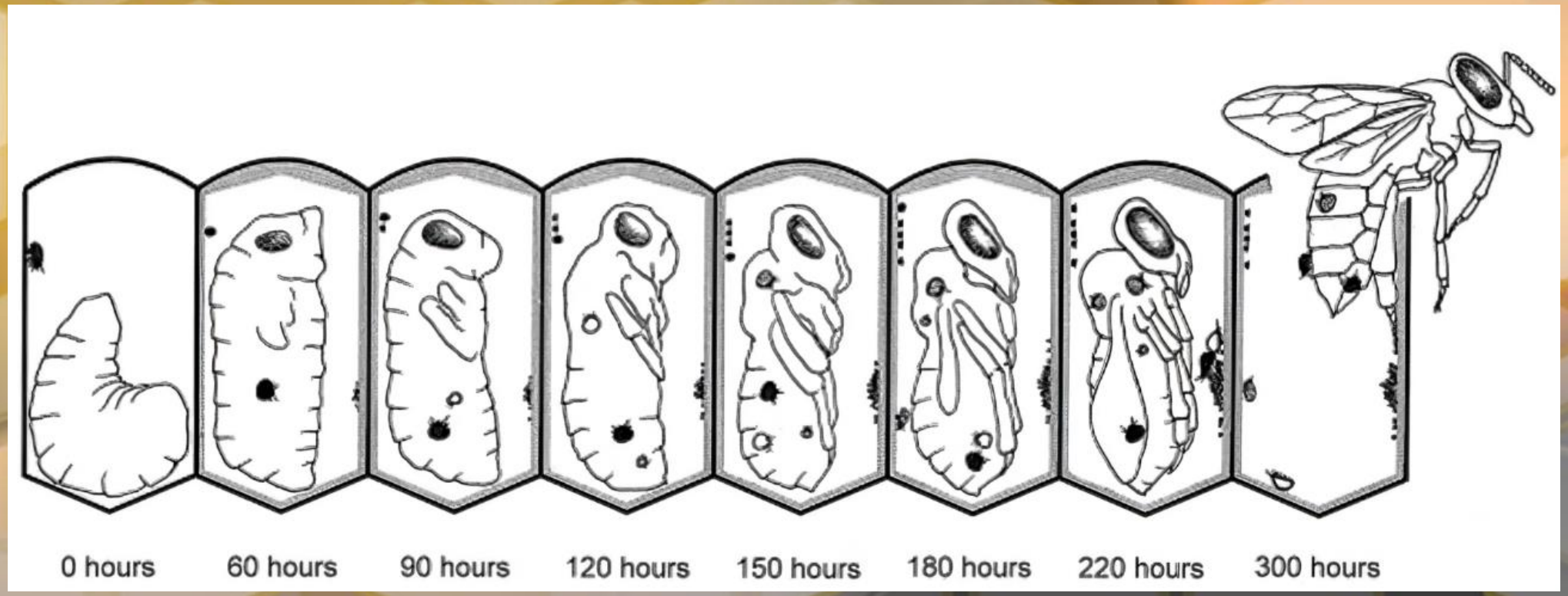
Varroa destructor

- History of Varroa Mites in the United States
- Biology of Varroa Mites in the Hive
- Methods to Check your Hive for Mite Levels
- When to Treat for Varroa
- What to Use to Treat for Varroa

History of Varroa

- Varroa destructor is a natural parasite of the Asian honey bee, Apis cerana-damage is limited to drone brood.
- Spread to Russia, Europe, South America, Africa
- Our honey bee, Apis Mellifera, is a different species and has not evolved with a true host parasite relationship
- September 25, 1987 Florida
- Queens imported illegally
- With in 2-3 years they were spread all over the United States

Understanding Varroa Mite Life Cycle



Varroa Mite Life Cycle Explained

- Varroa feeds on the fat bodies of both adults and larva
- Mites can tell the difference from worker cell and drone brood cells from pheromones-prefer drone brood 24 days-21 days
- Foundress mite (first female)enters the cell 7-8 days from egg stage
- Hide in brood food, use breathing tubes not to drown and bees can't detect
- 30 hours later lays unfertilized egg male varroa, every 30 hours after that lays a female mite, male becomes sexually mature in 5-6 days. Then mates with several female mites, his sisters, unless more than one foundress mite enters the cell.
- Male dies in the cell
- The worker bee or drone emerges
- The adult mite feeds on the adult bee plus uses it for transportation that's called an ectoparasite or dispersal phase Varroa poop

Normal Brood

Deformed wings

These are bigger than the seed ticks that we get on us!

For comparison

Ways to Detect Mites

- Cappings Scratcher
- Varroa Poop
- Powdered Sugar Roll
- Alcohol Wash
- Sticky Board

CAPPING SCRATCHER METHOD

Drone Brood is preferred because of the 24 day gestation period- egg to adult vs. 21 days for worker brood

In the lifetime of a varroa a female can lay up to 10-17 mites on drone brood – in multiple entries into a drone brood

In a worker cell 5-10 varroa mites

Varroa Mite Poop-another tool

What you need for the sugar roll

Where to take your sample from

- Brood nest
- A frame with emerging brood
- No queen on frame

Collecting bee sample

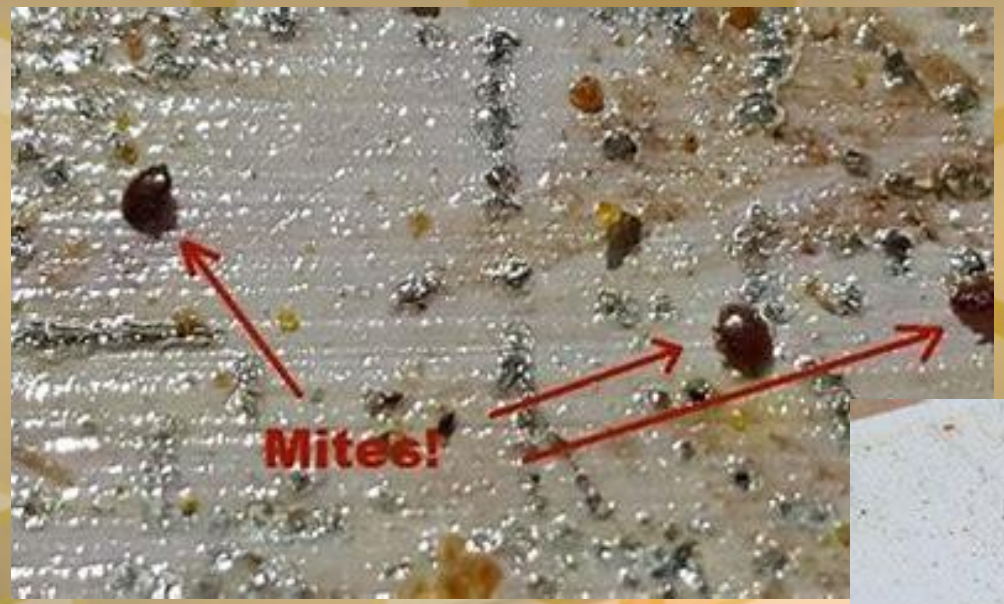
Let it sit for 3 minutes in the shade

The process- shake it onto a white surface

All of these dark spots are varroa destructor mites

What you need for the Alcohol Wash

Sticky Boards to monitor mite drop



Understanding Mite Count

When was the sample taken?

Before Supering-April/May

- **Treat when levels are 2-3 mites per sample**

Mid honey flow (optional) June-July

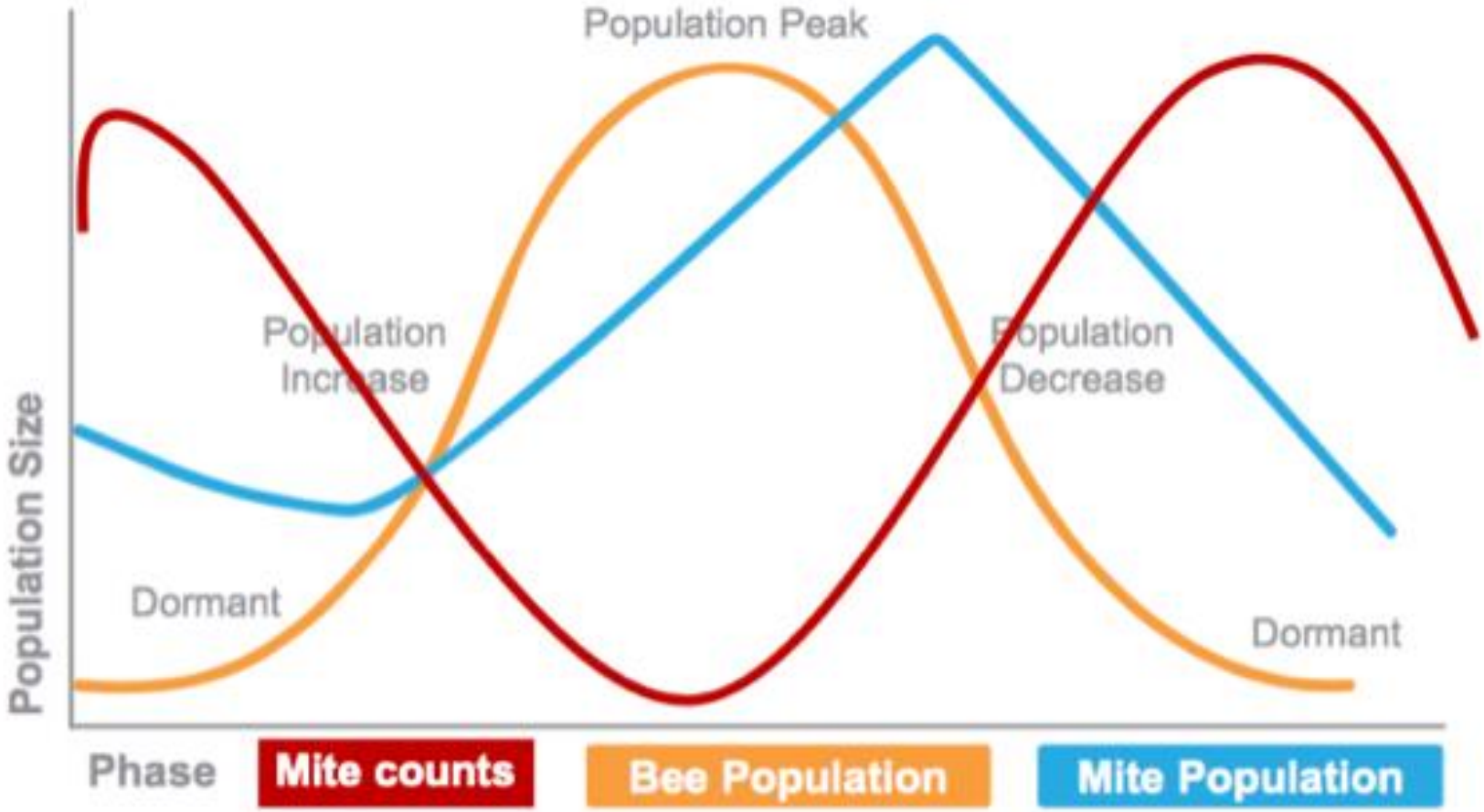
- **Remove Crop and treat when 3-5 or more mites are in your sample**

Post Honey Flow before final brood rearing August/ September

-Treat when levels are 3-5 mites per sample

Post treatment to see how your treatment worked

Monitoring Varroa levels



Mite monitoring may yield very different mite counts than actual levels
Mite counts are skewed by brood population and mites in brood cells

Before Supering-April/May
Treat when levels are 2 mites per sample-Why?

- You want your mites under control in the early spring during hive build up.
- Knock the mites down early so that the hive doesn't crash before or during the honey flow or so that you don't have to treat during the honey flow.
- Also, some treatments require completion x number of days before adding supers.

Post Honey Flow before final brood rearing August/ September

Treat in the fall, test after you treat

- When you pull your honey supers off, all of the honey bees with their mites are now forced down into the brood boxes. This forces all mites into the brood and raises the mite level.
- Treat by Labor day so the bees that will be your winter bees are healthy.

Treatments for Varroa destructor

- Apistan, Checkmite, Apivar
- Apiguard
- Oxalic Acid
- Formic Pro, Mite A Way Quick Strips
- HopGuard III
- Api Life Var-not effective

Apistan, Checkmite and Apivar

- Apistan– Fluvalinate, easy to use strips, however, synthetic chemical. Mites have built up resistance to it.
- Apivar- easy to use strips, Amitraz- used on cattle and used illegally by beekeepers so mites are resistant to it.
- Checkmite is Coumaphos which is carcinogen- which means cancer causing. Mites are resistant to it.

HopGuard III

- A natural treatment from hop plant
- Up to 3 applications a year
- Can use with honey supers on- place strips in brood box
- Leave in for up to 30 days

Apiguard

- Thymol treatment, Natural
- Applied on top of brood frames
- Use spring and fall
- Not for use with honey supers
- Need a rim or shim
- Solid bottom board needed
- 3-4 Treatments
- Temperature range 59-100 degrees

Formic Pro

- Formic Acid in a gel, natural treatment
- 14 day or 20 day treatment period
- Spring or fall or with honey supers
- Solid Bottom Board needed
- Temperature range 50-85 degrees

Oxalic Acid

- Natural Treatment
- Kills Phoretic (ectoparasites) mites- which means on bees not in brood-vapor won't go through brood cappings

- 2 methods of use –
- Dribble used in brood less periods- Thanksgiving to New years and on package bees
- How to Use the Oxalic Acid Dribble Method (betterbee.com)
- Acid Vaporizer, must have power source- battery- time consuming

Oxalic Acid


OXALIC ACID MIX
FOR VETERINARY USE ONLY
10
20
30
40
50
60ml
GardenFork.TV


SAVOGRAN
Wood Bleach
Decolorador para madera

Do a Post Test

Treating package bees

- You can use the Oxalic acid dribble
- Can treat while in the package
- Or can treat when installed and settled in the hive- when the queen has been accepted, but before there is sealed brood
- Day 7 or 8
- The reason to treat a package of bees is to knock the mite load down so that you can get by to do a full treatment in the fall

Directions for Mixing the Oxalic Acid to Use in a Dribble

- For 5 hives
- 8.75 grams of Oxalic Acid
- 6 oz. of Hot Water
- ¾ cup of sugar

Dissolve the Oxalic in the hot water then add your sugar and stir to dissolve the sugar.

Fill your syringe with 50 ml of solution

Dribble it between the frames where the bees are

Treating Nucs and Established Hives

- Ask the person that you are purchasing bees from if they have been treated
- If purchasing a nuc from someone who is reselling nucs they may not know if they have been treated– do a mite test!
- Treating new bees to knock the mite load down goes really far to ensure that your bees will make it through the winter.
- To repeat– Treat by Labor Day to have fat healthy bees going into winter

Vaporization with Oxalic

- Label says 1 gm per box – research shows (Cameron Jack and Jennifer Berry) not enough so using 2 gms. per box –
- in a double (2 hive bodies) 4 gms.
- gram is ¼ teaspoon so 2 hive bodies- use 1 teaspoon
- Broodless- 1 treatment
- With brood 3 treatments – 5-6 days apart

Other options- IPM- Integrated Pest Management

- Brood break
  - Cage the queen for at least 20 days, ideally 24 days
  - As brood emerges mites are forced out of the cells
    - Mites are more susceptible to mite treatments
- Drone Brood Removal
  - Use a drone cell frame
    - Green drone comb
    - Remove before drones emerge, put in the freezer

In conclusion

- Varroa mites have reduced bee flight activity
- Weight loss of 6-25% of bees
- Shortened life span for adult bees of 34-68%
- External damage – chewed wings, legs, stunted growth
- Virus's
- Winter loss- more colony deaths
- Dead brood
- Less honey production
- Made us better beekeepers because we pay more attention to our bees

Catch Tray for Dead Bees
This has nothing to do with varroa mites-

Beekeeping with Varroa

- I’ve had bees since before varroa
- Consider the cost of your hive and bees-if you don’t treat
- Understanding Varroa destructor and its life cycle will help you to become a successful beekeeper
- You just can not ignore the importance of knowledge of varroa mites and their effect on a honey bee colony

Open Apiary-NEKBA Mentoring

- Money to purchase the hives and bees was supplied from a grant from the Great Plains Master Beekeepers-GPMB.
- Watch the Buzzer and the NEKBA Facebook for dates and times – weather & volunteer dependent, meet before the 3rd Monday night meeting and 1-2 Saturdays a month
- Located at Pendleton's Country Market, 1446 E 1850 Rd., Lawrence KS 66046

Contact information

- Joli Winer and

  Cecil Sweeney
- 913-593-3562 call or text
- heartlandhoneyks@gmail.com
- Mentoring once a month - watch Buzzer and NEKBA Facebook for dates and times