# Preparing Your Colonies for Winter - Starting in June!


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USDA

ars

# *Disclaimer…*

- ***My recommendations***
- ***There are no USDA guidelines***
- ***Success not guaranteed***
- ***Suggestions will help, not hurt bees***

# Fall Summer – Beekeeper's New Year

- ***Beekeepers are having trouble getting colonies to survive winter***
- ***Care of colonies now will improve survival of colonies through winter.***
- ***I will discuss things you can do that are easy to maintain healthy bees.***

# *Why Colonies Die?*

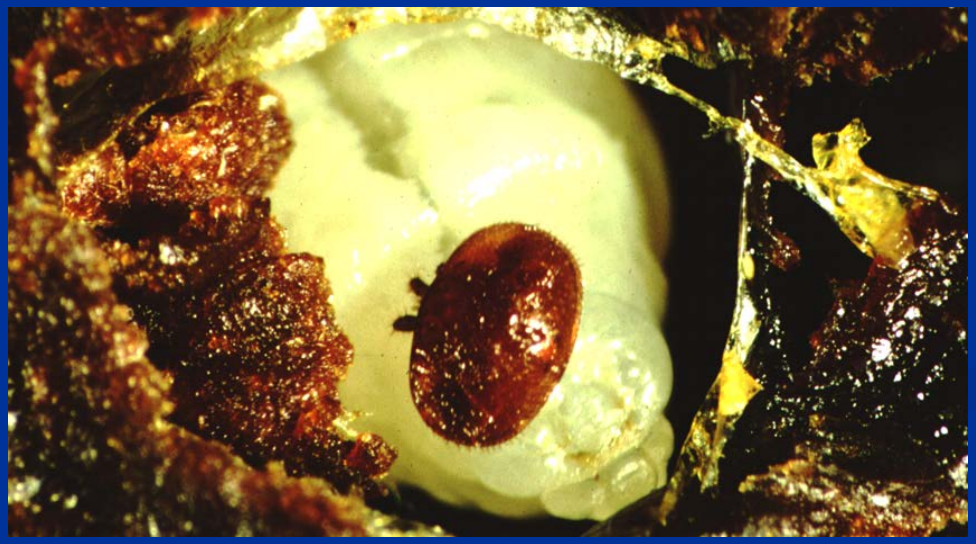
- ***Don't have all the answers***
- ***Parasites – varroa mites***
- ***Viruses***
- ***Disease***
- ***Lack of food***
- ***Neglect***

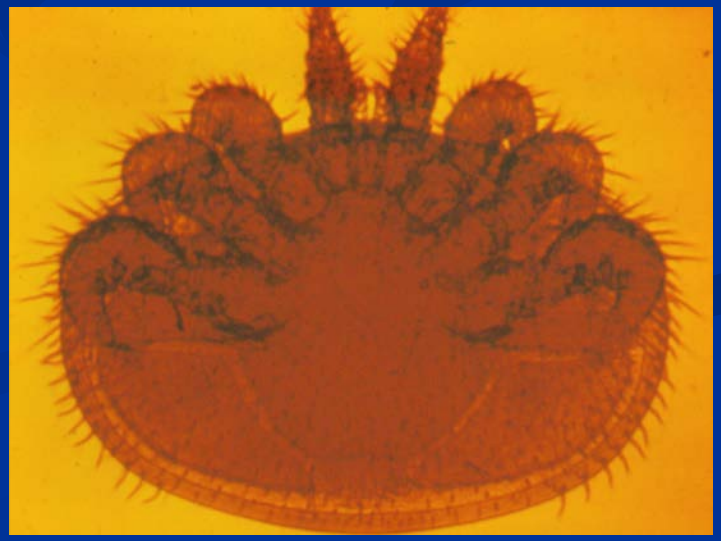
# *The Ideal Colony on October 31*

- ***Young bees***
- ***5+ pounds bees/1 deep box bees***
- ***Very few varroa mites***
- ***Little or no nosema disease***
- ***60+ pounds honey in the right place***

# *Dealing with Varroa Mites*

- ***Pinhead size***
- ***Reproduces in brood***
- ***Feeds on brood and adult bees***

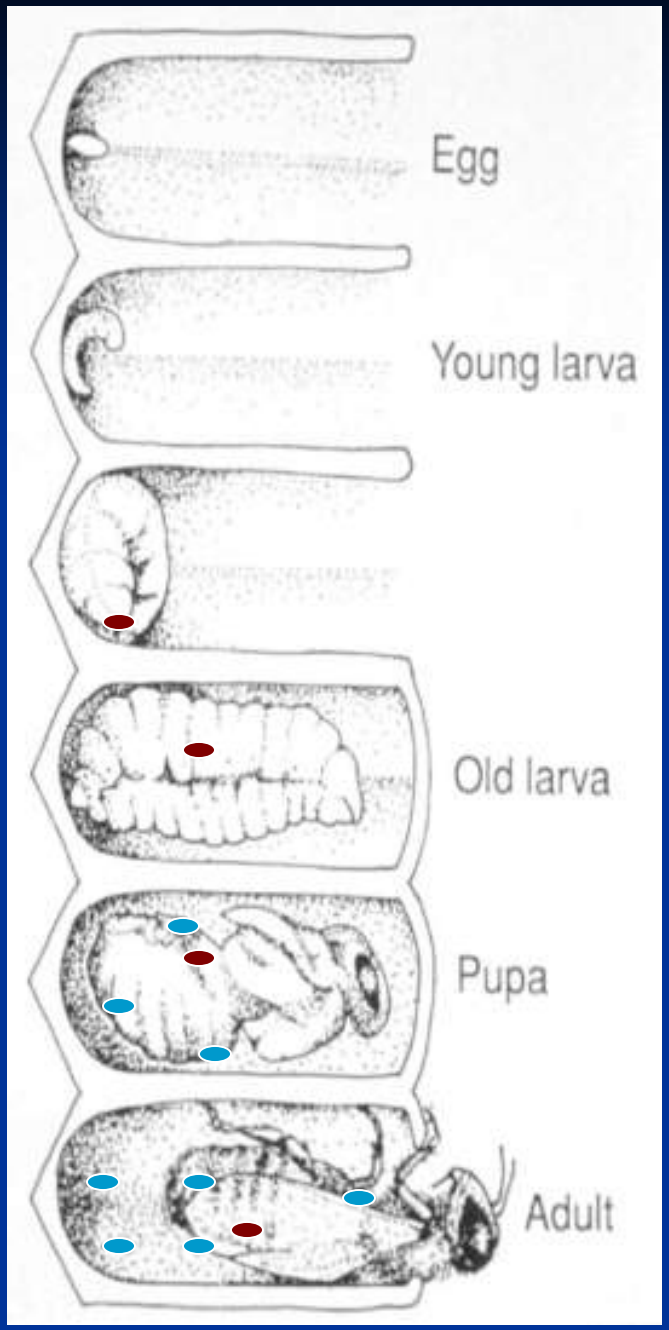




# *Dealing with Varroa Mites*

- ***Kills untreated colonies < than 1 year***
- ***The biggest cause of colony losses that can be controlled by beekeepers***

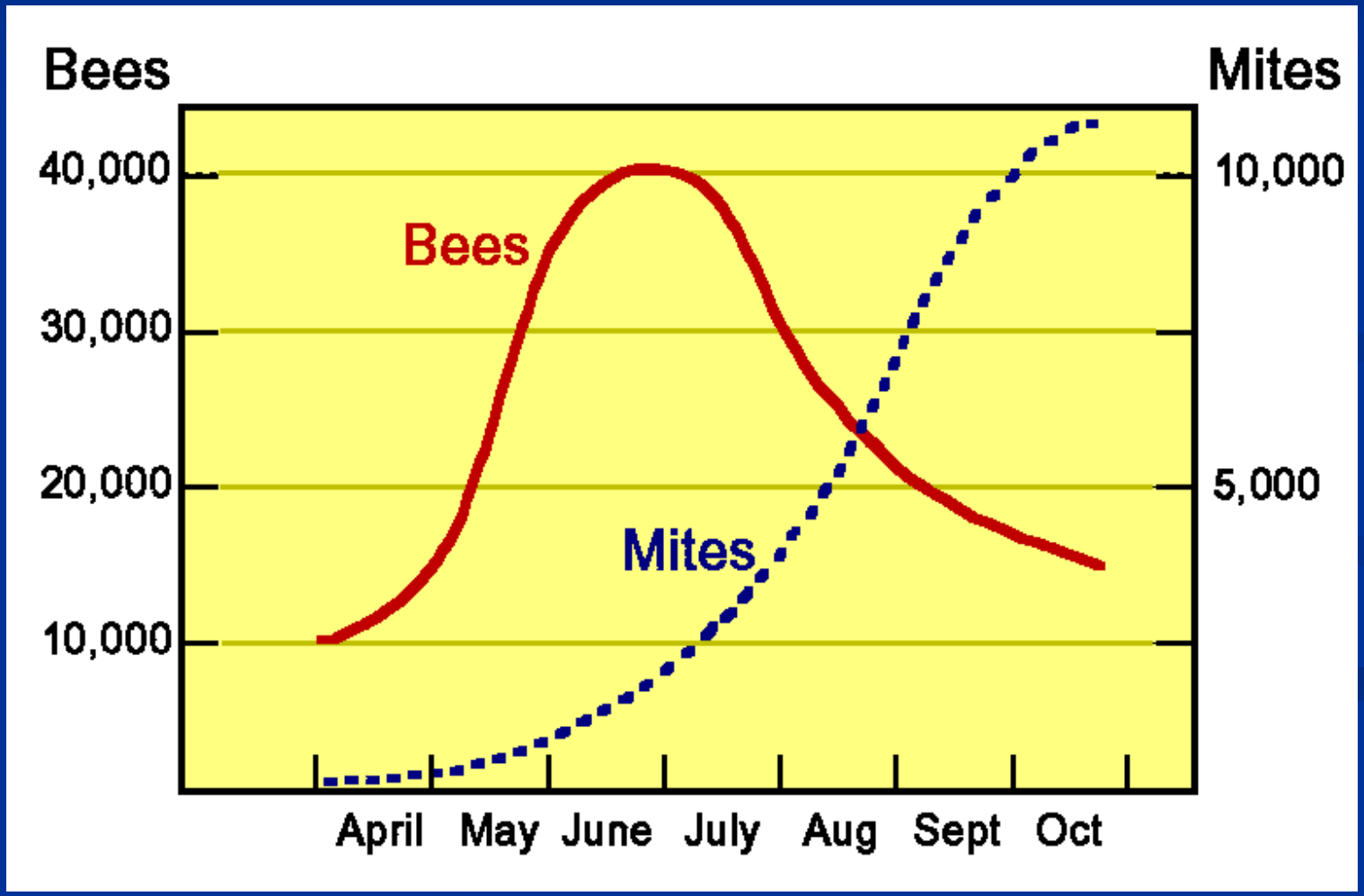





# Varroa Mite Life Cycle

- Enters cell (approx. 20 hrs before cell is capped).
- 1st egg (60 hrs after capping)
- 2nd egg (90 hrs after capping)
- 3rd egg (120 hrs after capping)
- 4th egg (150 hrs after capping)
- Time until sexual maturity
  - Females: 7 to 8 days
  - Males: 6 to 7 days
- 3 mated females emerge with adult bee.

# *Varroa Mite Life Cycle*



# *Varroa Mite Monitoring*

- ***How many colonies in an apiary need to be checked?***
  - ***<10 colonies – check all***
  - ***>10 colonies – check a percentage***

Varroa Mites 7/9/09 → 24 hours in hive from 7/8/09

| Yard | Hive # | # Mites |
|---|---|---|
| SFARM | 187 | 34 |
| SFARM | 191 | 86 |
| 11 | 120 | ~~104~~ 83 |
| 11 | 134 | ~~135~~ 45 |
| ~~SFARM~~ POU | 177 | 212 |
| POU | 40 | 14 |
| POU | 188 | 54 |
| GU | 203 | 15 |
| GU | 47 | 14 |
| Mush | 352 | 31 |
| Mush | 366 | 16 |
| Mush | 323 | 5 |
| Mush | 309 | 12 |
| Mush | 24 | 4 |
| Mush | 22 | 6 |
| Mush | 311 | 3 |
| Mush | 20 | 17 |
| Mush | 317 | 37 |
| Mush | 11 | 8 |
| Mush | 340 | 31 |
| Mush | 174 | 39 |
| GU | 291 | 44 |
| GU | 308 | 19 |
| GU | 325 | 5 |
| GU | 197 | 26 |
| GU | 299 | 42 |
| GU | 312 | 31 |
| GU | 173 | 27 |

| Yard | Hive # | # Mites |
|---|---|---|
| next to barn | 60 | 9 |
| meadow | 29 | 2 |
| GU | 24 | 18 |
| meadow | 292 | 50 |
| meadow | 288 | 7 |
| meadow | 147 | 4 |
| meadow | 217 | 30 |
| meadow | 205 | 24 |
| meadow | 20 | 7 |
| meadow | 40 | 120 |
| meadow | 19 | 5 |
| meadow | 336 | 23 |
| meadow | 121 | 31 – tons of CB |
| meadow | 289 | 39 |
| meadow | 36 | 4 |
| POU | 307 | 21 |
| POU | 109 | 10 |
| POU | 14 | 35 |
| POU | 145 | 9 |
| Para | 1 | 19 |
| Para | 3 | 26 |
| Para | 4 | 17 |
| Para | 2 | 6 |
| Para | 5 | 11 |
| Para | 6 | 36 |
| Para | 7 | 1 |
| BIO | 190 | 17 |
| BIO | 298 | 8 |

# *Varroa Mite Monitoring*

## *Sugar Roll Test*

- ***Materials needed***
  - ***Pint or quart wide mouth mason jar***
  - ***Put 8 mesh hardware cloth in lid***
  - ***Pan of water***
  - ***Cardboard box***
  - ***1 cup measuring cup***
  - ***Domino confectioners sugar***

# *Varroa Mite Monitoring*

## *Sugar Roll Test*

- ***Procedure***
  - ***Remove frame with plenty of bees***
  - ***Make sure queen is NOT present***
  - ***Shake bees into open cardboard box***
  - ***Knock bees into corner of box***

# *Varroa Mite Monitoring*

## *Sugar Roll Test*

- ***Procedure***
  - ***Collect/remove full measuring cup of bees (approximately 300 bees)***
  - ***Add bees to mason jar, close lid***
  - ***Add heaping teaspoon powdered sugar to jar***

# *Varroa Mite Monitoring*

## *Sugar Roll Test*

- ***Procedure***
  - ***Shake bees to cover with sugar***
  - ***Let jar sit for 5 minutes***
  - ***Briskly shake jar upside down over pan with water***

# *Varroa Mite Monitoring*

## *Sugar Roll Test*

- ***Procedure***
  - ***Varroa mites, if present will float on water***
  - ***Continue shaking until no more mites appear***
  - ***Count the number of mites recovered***

# *Varroa Mite Monitoring*

## *Sugar Roll Test*

- ***Interpreting the results***
  - ***<5 mites – check again in two months***
  - ***>5 but ≤ 15 mites – check again in 1 month***
  - ***> 15 mites – treatment required***

# Varroa Mite Monitoring

## Natural Mite Drop Test

- ***Materials needed***
  - ***Screened bottom board with tray or wooden frame with 8 mesh hardware cloth***
  - ***Purchased sticky paper or butcher paper sprayed with Pam***

# *Varroa Mite Monitoring*

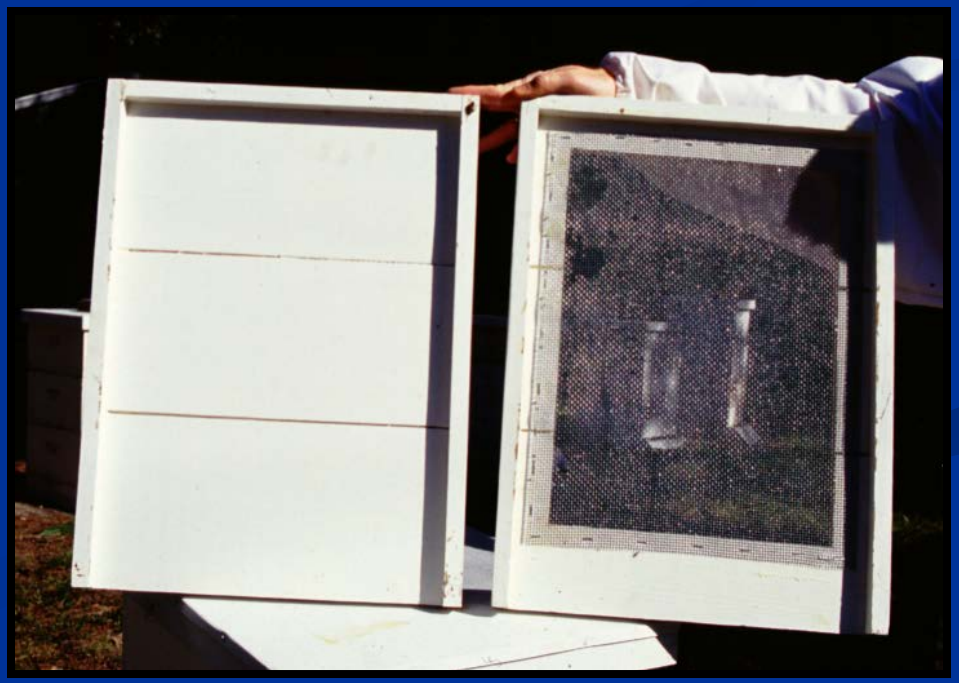
## *Natural Mite Drop Test*

- ***Procedure***
  - ***Clean bottom board of hive***
  - ***Place sticky board under wood frame with hardware cloth or on tray under screened bottom board***

# Varroa Mite Monitoring

## Natural Mite Drop Test

- ***Procedure***
  - ***Leave sticky board on hive for 3 days***
  - ***Remove sticky board and count mites***
  - ***Divide mite count by 3 to get average 1 day natural mite drop***



# *Varroa Mite Monitoring*

## *Natural Mite Drop Test*

- ***Interpreting the results***
  - ***<10 mites – resample in 2 months***
  - ***11-30 mites – resample in 1 month***
  - ***31+ mites – treatment required***

# *Varroa Mite Treatments*

## *Api Life Var*

- ***Thymol – contact/fumigant***

# Varroa Mite Treatments

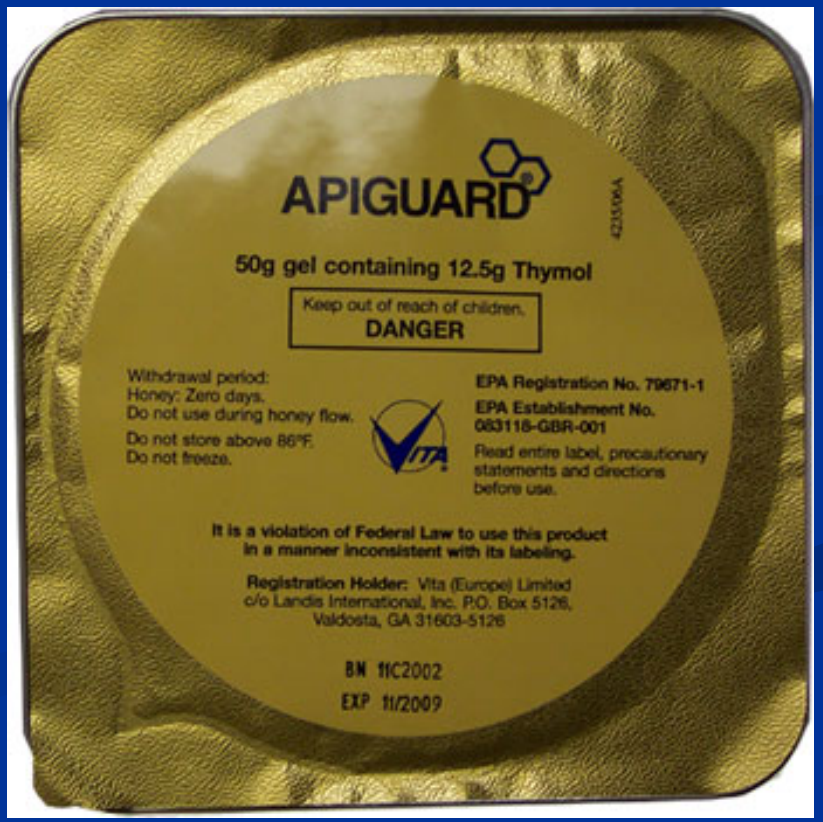
## Api Life Var

- ***Cost: $5.50/colony***
- ***Mode of Action:***
  - ***Thymol in slow release wafer***
  - ***Contact with bees***
- ***Advantages:***
  - ***Controls Varroa, HBTM (70%)***
  - ***A Safe product with little issue of residue.***
- ***Limitations:***
  - ***Kills mites on adult bees only***
  - ***Use above 60$^{O}$F/10$^{O}$C***
  - ***Results variable***
  - ***3 treatments***
  - ***Reduces brood rearing***

# *Varroa Mite Treatments*

## *Apiguard*

- ***Thymol – contact/fumigant***



# Varroa Mite Treatments

## Apiguard

- ***Cost: $6.60***
- ***Mode of Action:***
  - ***Thymol in slow release gel.***
  - ***Contact with bees***
- ***Advantages:***
  - ***Controls Varroa, HBTM***
  - ***A Safe product with little issue of residue.***
- ***Limitation:***
  - ***Kills mites on adult bees only.***
  - ***Use above 60$^{O}$F/10$^{O}$C***
  - ***Results variable***
  - ***2 treatments***
  - ***Reduces brood rearing***

1. Open an Apiguard tray

2. Put the tray on top of the brood frames

3. Replace with a second tray after two weeks

4. The treatment lasts about 4-6weeks

# *Varroa Mite Treatments*

## *Mite Away Quick Strips (MAQS)*

- ***Formic acid - fumigant***

# Varroa Mite Treatments

## Mite Away Quick Strips (MAQS)

- ***Cost: $4.50***
- ***Mode of Action:***
  - ***Formic acid - fumigant***
- ***Advantages:***
  - ***Controls Varroa, HBTM***
  - ***7 day treatment***
  - ***Can use during honey flow***
  - ***Strips not removed***
- ***Limitation:***
  - ***Must be between 50-92$^{o}$F***
  - ***Reduces brood production***
- ***Hazardous to use***

# Varroa Mite Treatments

- ***What not to use:***
  - ***Apistan***
  - ***Check Mite+***
  - ***Powdered sugar***
  - ***Homemade brews***

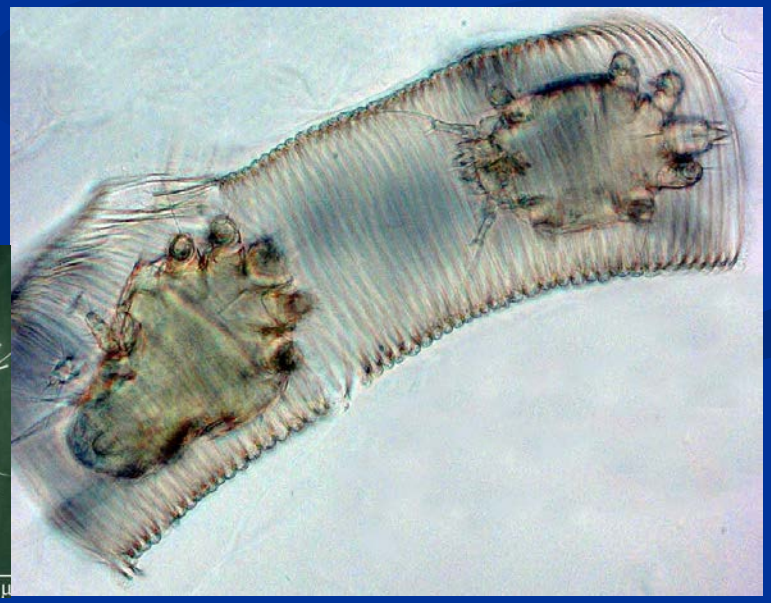

# *Varroa Mite Treatments*

## *Considerations:*

- ***Rotate medications.***
- ***Resistance problems***
- ***Do not use any meds when supers are on colonies (except MAQS).***

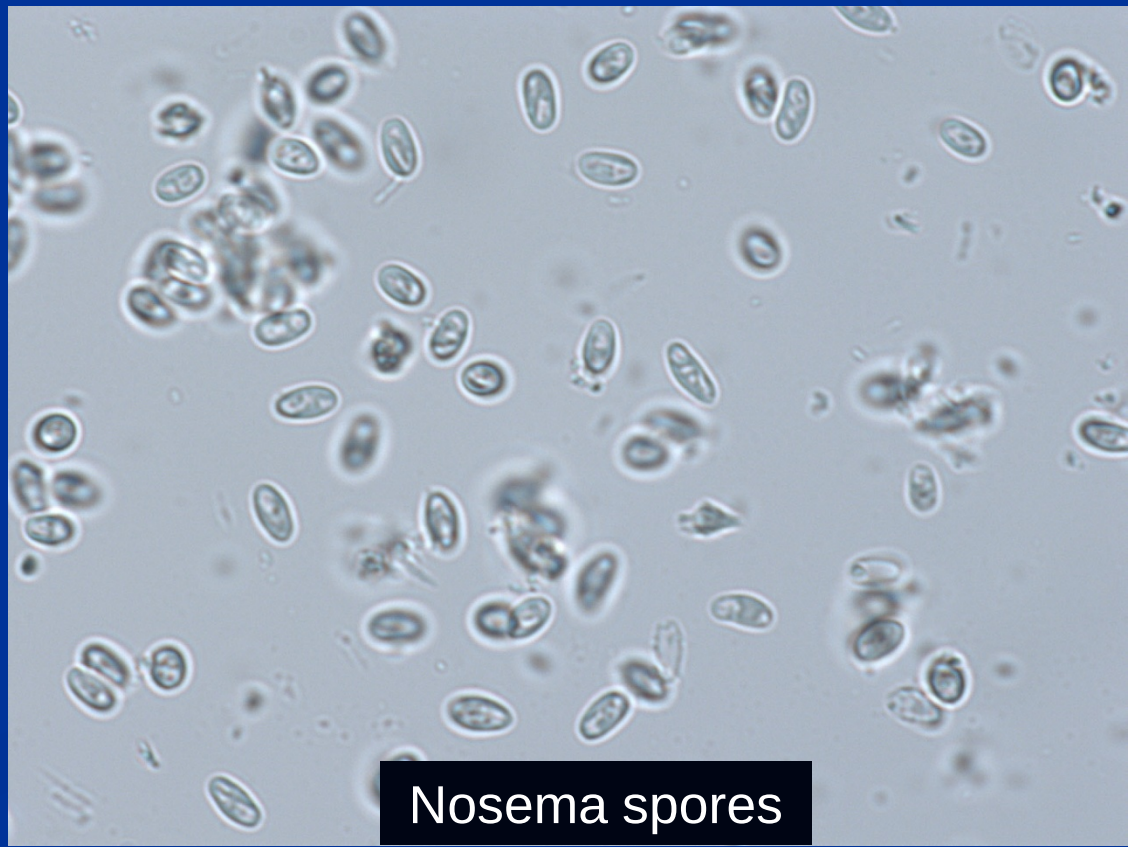
# Honey Bee Tracheal Mite

- ***Low levels in most colonies***
- ***Seldom found in our area***
- ***Varroa treatments also kill HBTM***
- ***Don't bother to treat for this parasite***

# *Nosema Disease*

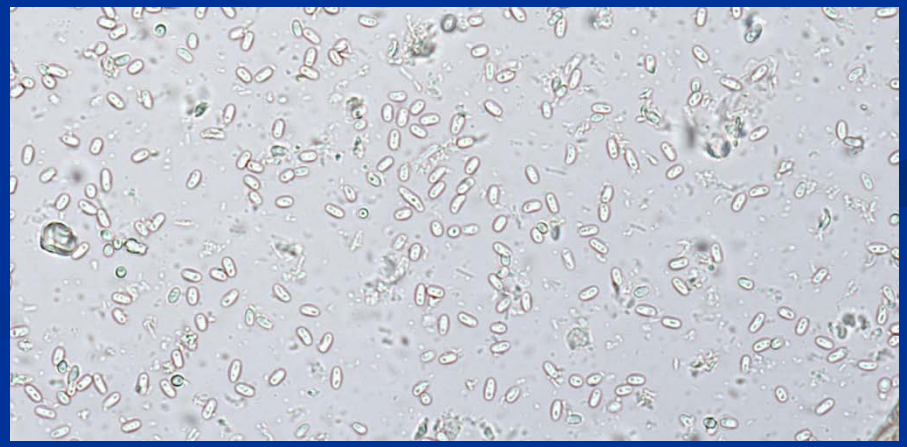
- ***Two species in the U.S.***
  - ***Nosema apis <5%***
  - ***Nosema ceranae >95%***



Nosema spores

# *Nosema Disease*

- ***No obvious symptoms***
- ***Infection of digestive tract***
- ***Shorten lives of bees***
- ***Many unanswered questions***
  - ***When to treat***
  - ***How often to treat***
  - ***Do treatments harm bees?***



# *Nosema Disease*

## *How to Survey*

- ***Bees must be examined microscopicly***
- ***Collect foraging bees or bees from edge of cluster***
- ***Knock bees into jar with alcohol***
- ***Collect ~100 bees***

# *Nosema Disease*

## *How to Survey*

- ***<5 colonies – survey all colonies***
- ***≥ 5 colonies – survey a % of colonies***

# *Nosema Disease*

## *Sample Diagnosis*

- ***Mail samples to the BRL***

Bee Disease Diagnosis
Bee Research Laboratory
Bldg 476, BARC-E
Beltsville, MD 20705

# *Nosema Disease*

## *Sample Diagnosis*

- ***Label samples (if more than 1)***
- ***Do not use magic marker***
- ***Write with pencil on paper placed in sample***

# *Nosema Disease*

## *Sample Diagnosis*

- ***Pour off alcohol before shipping***
- ***Place bees in ZipLoc brand bags***
- ***Double bag samples***
- ***Do not use “zipper bags”***

# *Nosema Disease*

## *Sample Diagnosis*

- ***Include data sheet with sample***
  - ***Provide name, address, phone number, e-mail address***
  - ***Do not put sheet in bag with sample***


Adult bee samples in alcohol for examination

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# Products & Services

**Disease & Pest Information**
Causes, effects, symtoms and precautions against spread of honeybee diseases.

**Disease Diagnosis Service**
A service for the diagnosis of bee diseases provided by the laboratory for beekeepers and state inspectors.

**How to Submit Samples**
How and where to send samples of adult bees or brood for diagnosis.

**Diagnosis of Honey Bee Diseases Agricultrual Handbook No.690**
This handbook describes laboratory techniques used to diagnose diseases and other abnormalities on the honey bee and to identify other parasites and pests.

**Resistance Test**
How use Apistan® and CheckMite+™ strips to test for resistance of mites to chemical controls.

**ARS Bee Bibliography**
Searchable database of over 30,000 records in the historical Beekeeping Bibliography (1925 to 1972), with link to the National Agricultural Library's Agricola database containing post-'72 bibliography.

**Beenome Group**
Bee Lab and Genbank data, and publications about genome research on honeybees and pests.

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Recent Bee Lab publications and publication lists of Bee Lab scientists.

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# Products & Services

**How to Submit Samples**

## Submission of Samples for Diagnosis:

### Samples of Adult Honey Bees

- Send at least 100 bees and if possible, select bees that are dying or that died recently. Decayed bees are not satisfactory for examination.
- Bees should be placed in 70% ethyl, methyl, or isopropyl alcohol as soon as possible after collection and packed in leak-proof containers.

### Samples of Brood Comb

- A comb sample should be at least 2 x 2 inches and contain as much of the dead or discolored brood as possible. **NO HONEY SHOULD BE PRESENT IN THE SAMPLE.**
- The comb can be sent in a paper bag or loosely wrapped in a paper towel, newspaper, etc. and sent in a heavy cardboard box. **AVOID wrappings such as plastic, aluminum foil, waxed paper, tin, glass, etc.** because they promote decomposition and the growth of mold.
- If a comb cannot be sent, the probe used to examine a diseased larva in the cell may contain enough material for tests. The probe can be wrapped in paper and sent to the laboratory in an envelope.

### How to Address Samples

- Include a short description of the problem along with your name, address, phone number or e-mail address.
- There is no charge for this service.
- For additional information, contact Bart Smith by phone at (301) 504-8821 or e-mail: bart.smith@ars.usda.gov

- **Send samples originating from the U.S. to:**

  Bee Disease Diagnosis
  Bee Research Laboratory
  Bldg. 476 Room 204
  Beltsville Agricultural Research Center - East
  Beltsville, MD 20705

- **For samples originating from Canada click here.**

- **Samples are not accepted from other countries**

# *Nosema Disease*

## *Sample Results*

- ***No nosema – resample in 2 months***
- ***<1,000,000 spores/bee during summer – resample in 2 months***
- ***<1,000,000 spores/bee during fall – treat***

# *Nosema Disease*

## *Sample Results*

- ***>1,000,000 spores/bee during summer – treat and resample in 1 month***
- ***>1,000,000 spores/bee during fall – treat prior to winter***

# Nosema Disease

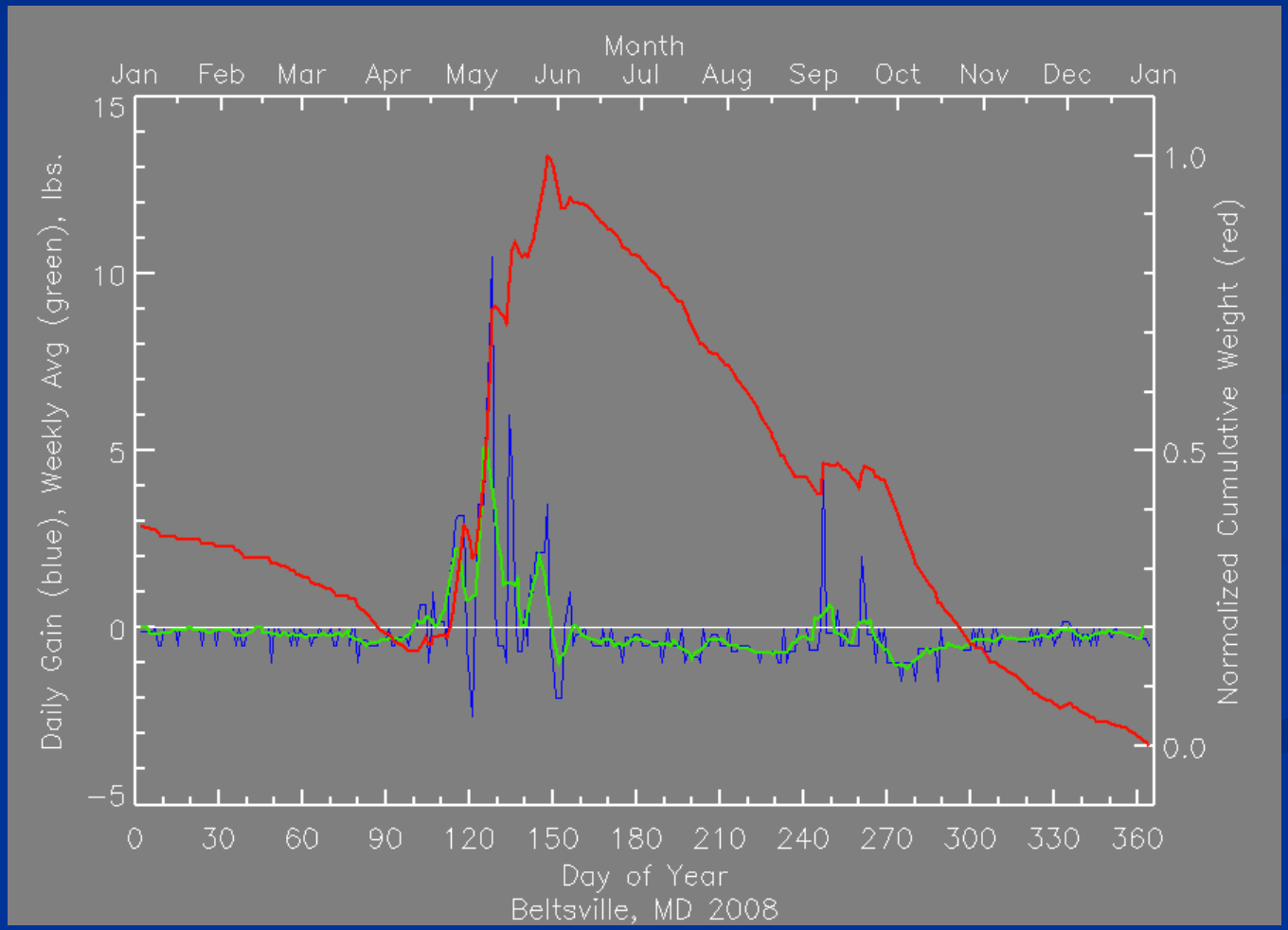
## Treatment

- ***Fumagilin-B***
  - ***Feed 1 gallon medicated syrup during summer***
  - ***Feed 2 gallons medicated syrup during fall***
  - ***Do <u>not</u> expose medicated syrup to sunlight***

# *Maryland's Honey Flow*

- ***USDA Scale hive***
  - ***Gained 124 lbs between May 2 and June 9***
- ***Now loosing 1 lb each day***
- ***See "Honey Bee Net"***
  ***http://honeybeenet.gsfc.nasa.gov/***

# Maryland's Honey Flow



# *Feed During the Summer*

- ***Feed once a week***
- ***Feed 1:1 (sugar:water) sugar syrup by volume***
- ***Feed 2:1 sugar syrup by volume if colony is short on food***

# *Feed in the Fall*

- ***Feed once a week or continuously if colony is short on food***
- ***Feed 2:1 sugar syrup by volume***
- ***Colony should have 60 lbs food by the end of October***

# *Feed in the Fall*

- ***Most food should be in the upper deep box – ideally it should be full!***
- ***"Top off" the hive during the last 2 weeks of October even if they don't need it.***
- ***Discontinue feeding after October 31***

# *Fall Position of Brood*

- ***If the bees have not done so – position the brood in the center of the bottom box.***
- ***There should be some honey next to the brood nest.  Most of the honey should be above the bees.***

# *Provide Wind Break*

# August – September
## Optional Work

- ***Requeen colonies.***
  - ***Done by few hobby beekeepers.***
  - ***Many advantages***
    - ***Will produce more young bees for overwintering.***
    - ***May prevent swarming next spring.***
    - ***Helps with mite control.***

# August - October

- ***Unite weak and queenless colonies.***
  - ***Small or ailing colonies will not survive winter.***
  - ***Combine using newspaper.***

# *August - October*

- ***Inspect for diseases and parasites.***
  - ***Check for healthy brood.***
  - ***Get help if you find a problem you don't understand.***

# *September - October*

- ***Reduce to 2 deep hive bodies.***

# October

- ***Reduce colony entrance.***

# *Late October*

- ***Provision for venting moisture at top of colony.***
- ***Or provide upper entrance.***

# Head to Florida

- ***Sit on the beach and wait for spring.***

# *Questions?*