

# Varroa Management

Susquehanna Beekeepers Association

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Harry Dutcher

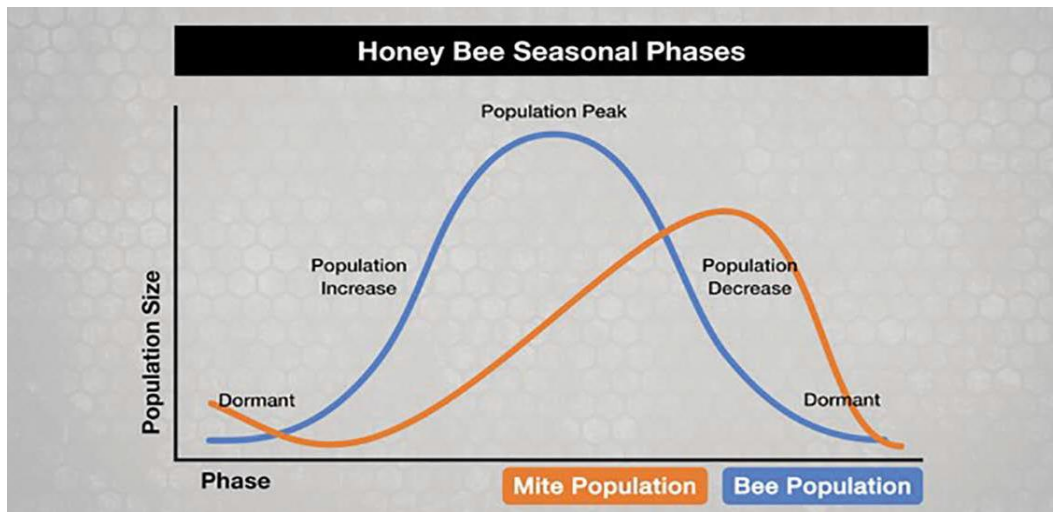


# Varroa Management

- ▶ Schedule and Planning
- ▶ Checking and Monitoring
- ▶ Treatment Thresholds
- ▶ Treatment Options
- ▶ My Schedule and Plan
- ▶ Summary
- ▶ References

# Schedule and Planning

- ▶ Know your Honey Bee and Varroa Mite Seasonal Development
  - ▶ Central Maryland Honey Bee Population Pattern - Generally
    - ▶ Dormant: Dec - Feb
    - ▶ Population Increase: Mar - Jun
    - ▶ Population Peak: July
    - ▶ Population Decrease: Aug - Nov
  - ▶ Varroa Population
    - ▶ In synchrony with bee population
    - ▶ Reach their peak soon after bee population peaks - more brood results in more varroa!
    - ▶ Less brood more varroa on adult bees - phoretic
    - ▶ Varroa percentage at the start of bee population decrease is CRITICAL!



## Varroa Checking

- ▶ Can identify if varroa is present, but does not account for colony population
- ▶ May lead you to do monitoring
  - ▶ Drone Brood Assessment
    - ▶ Open about 10 capped drone cells
  - ▶ Sticky Board
    - ▶ Varroa drop over time; 1-3 days
      - ▶ Calculate 24 hour varroa drop
      - ▶ Treatment threshold varies
      - ▶ Quick check for treatment results
  - ▶ Adult Bee Inspection
    - ▶ Varroa visible on thorax and back of adult bees indicates high infestation exist



# Varroa Monitoring

- ▶ Methods estimate a colony's varroa population
  - ▶ Removes varroa from the bodies of adult bees for counting
    - ▶ Standard sample size - ½ cup ~300 bees
    - ▶ Determine the number of varroa per 100 adult bees = percentage of infestation
    - ▶ Don't confuse varroa count with varroa percentage
  - ▶ Sampling Frequency
    - ▶ Minimum of once each population phase (except for Dormant phase)
    - ▶ Resample after treatments to check effectiveness.
  - ▶ How many colonies to sample?
    - ▶ Hobby beekeepers - recommend 100% or 50% of larger apiaries
  - ▶ Recommended Sampling Methods
    - ▶ Powdered Sugar Shake
      - ▶ Non-lethal, bees can be returned to the hive after testing
      - ▶ 75% accurate
    - ▶ Alcohol Wash
      - ▶ Kills the bees
      - ▶ 90% accurate



# Treatment Thresholds

- ▶ Guidelines for when a colony needs treatment

- ▶ Tools for Varroa Management, Pg 9, Table 1: Treatment Thresholds by Phase

Table 1: Treatment Thresholds by Phase;(%=Number of mites/100 adult bees)

Colony Phase	Acceptable Further control not needed	Caution Control may be warranted	Danger Control promptly
Dormant with brood	<1%	1-2%	>2%
Dormant without brood	<1%	1-3%	>3%
Population Increase	<1%	1-3%	>3%
Peak Population	<2%	2-5%	>5%
Population Decrease	<2%	2-3%	>3%

**Acceptable:** Current mite populations are not an immediate threat.

**Caution:** Mite population is reaching levels that may soon cause damage; non-chemical control might be employed while chemical control may be needed within a month; continue to sample and be prepared to intervene.

**Danger:** Colony loss is likely unless the beekeeper controls Varroa immediately.

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New colonies (splits, packages, swarms, Etc.) usually have low varroa levels the first year and may not need treatment

# Treatment Options

- ▶ Chemical Control Products
  - ▶ Synthetic Chemicals
    - ▶ **Apivar (amitrax)**
    - ▶ Apistan (fluvalinate)
    - ▶ CheckMite+ (coumaphas)
  - ▶ Essential Oils
    - ▶ Apiquard (thymol)
    - ▶ ApiLife Var (thymol, eucalyptol, menthol, camphor)
  - ▶ Acids
    - ▶ **Mite-Away-Quick-Strips (MAQS), Formic Pro (formic acid)**
    - ▶ **Oxalic Acid**
    - ▶ HopGuard II (hops beta acid)
- ▶ Recommend using commercially prepared and approved products
  - ▶ Tested for efficacy
  - ▶ Measured dose
  - ▶ Follow step-by-step directions for application conditions and safety

# Acid - Formic Acid

## ▶ Mite-Away-Quick-Strips (MAQS)

- ▶ Active ingredient and formulation - formic acid (organic acid) in a gel pad
- ▶ Mode of Contact: Fumigant
- ▶ Efficacy: Up to 95%
- ▶ Application
  - ▶ Temperature: 50° F - 85° F for first 3 days of application. <92° F for remaining time.
  - ▶ Full dose - 2 strips for 7 days OR half dose - 1 strip for 14 days, 2<sup>nd</sup> strip for 14 days
- ▶ Advantages
  - ▶ Can be used with honey supers
  - ▶ Kills varroa under brood cap
  - ▶ Bees will remove used strips
- ▶ Disadvantages
  - ▶ Sensitive to high temperatures
  - ▶ Can kill brood and queens
  - ▶ 12 month shelf-life



## ▶ Formic Pro - next generation of formic treatment

- ▶ Same active ingredient and considerations as MAQS
- ▶ 24 month shelf-life
- ▶ 2 strips for 14 days OR half dose - 1 strip for 10 days, 2<sup>nd</sup> strip for 10 days

## ▶ Tips

- ▶ READ and follow directions
- ▶ Apply in the evening to reduce initial vapor
- ▶ First 3 days are most intense





# Synthetic Chemical

## ▶ Apivar

- ▶ Active ingredient and formulation - amitraz on slow-release polymer strip
- ▶ Mode of action: Contact
- ▶ Efficacy: Up to 95%
- ▶ Application
  - ▶ Temperature: No restriction
  - ▶ 1 strip/5 frames of bees, 4 strips max/colony, 42 days min, 56 days max. **MUST** remove strips.
- ▶ Advantages
  - ▶ Easy application
  - ▶ Long-acting - kills varroa on emerging bees
- ▶ Disadvantages
  - ▶ Don't use with honey supers on. Remove 2 weeks prior
  - ▶ Low levels of residue detected in wax and honey
  - ▶ Potential for varroa to develop resistance
  - ▶ Open packages should be used within 2 weeks
- ▶ Tips
  - ▶ **READ** and follow directions



# Acid - Oxalic Acid

- ▶ Active ingredient and formulation - oxalic acid dihydrate, dribble or vaporization
- ▶ Mode of action - contact
- ▶ Efficacy: Up to 99% when brood not present
- ▶ Advantages
  - ▶ Kills phoretic varroa on adult bees
  - ▶ Low product cost
- ▶ Disadvantages
  - ▶ Does not kill varroa under brood cap
  - ▶ Don't use with honey supers on.
  - ▶ Corrosive - **MUST** use acid resistant gloves, protective glasses, and respirator for vaporization



# Acid - Oxalic Acid

## ▶ Application Methods

### ▶ Dribble - sugar syrup drip

- ▶ Apply during Dormant Period when bees are in cluster
- ▶ Dose - 5ml/seam of bees, 50ml max/colony
- ▶ Low equipment cost
- ▶ Use no more than 2x/year
- ▶ May chill the cluster



### ▶ Vaporization

- ▶ Use during early Population Increase and late Population Decrease periods when little to no brood is present
- ▶ Dose - 2 g/hive
- ▶ Hive doesn't need to be opened
- ▶ Requires vaporizer and power source
- ▶ Fumes are extremely dangerous - MUST use respirator



## ▶ Tips

- ▶ READ and follow directions
- ▶ Attend SBA demonstrations

# My Varroa Management Schedule and Plan

- ▶ 1<sup>st</sup> week of July - remove supers
- ▶ Mid July - sample several hives
  - ▶ If at least 1 hive in the apiary has >3% varroa infestation treat all hives in the apiary
    - ▶ Treat with Formic Pro - either full or half dose method
- ▶ Mid August - resample for treatment effectiveness
  - ▶ If >3% treatment threshold treat with Apivar
- ▶ Mid to Late September - sample several hives
  - ▶ If >3% treatment threshold treat with Apivar (if not already applied) or another product
- ▶ Late-October - sample several hives
  - ▶ If >3% treatment threshold treat with a product that has not been used this year
- ▶ Mid December - apply Oxalic Acid dribble



# Summary

- ▶ Prepare your own plan and schedule
- ▶ Research treatment options
- ▶ Share purchases with other SBA members
- ▶ Follow the directions
- ▶ Monitor effectiveness of treatment
- ▶ Attend SBA treatment demonstrations

# References

- ▶ Honey Bee Health Coalition <https://honeybeehealthcoalition.org/>
  - ▶ Protect Your Bees From Varroa Mites Presentation
  - ▶ Tools for Varroa Management, Sixth Edition - April 7, 2017
- ▶ Frank Licata - Varroa Biology and Control
  - ▶ Recorded February 17th, 2018 at the NJBA Winter Symposium.
  - ▶ <https://www.youtube.com/watch?v=rX-vc7OWHVw>
- ▶ Kevin Inglin- Getting Ahead of Varroa Presentation
  - ▶ Recorded April 22, 2018 at NWNJBA Meeting
  - ▶ [https://www.youtube.com/watch?v=4SGvNCPvbyQ&list=PLIU4Dbl59J\\_crZe6h05c2SKvtLkE\\_sK4n](https://www.youtube.com/watch?v=4SGvNCPvbyQ&list=PLIU4Dbl59J_crZe6h05c2SKvtLkE_sK4n)