



How to Treat for Varroa Mites via IPM in Southwestern Ohio By Paul Dorger





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Be The Best That You Can Be





The modern approach to pest control is Integrated Pest Management (IPM).

The four main components are:

- 1. Knowledge of pests and diseases and how they interact with the host (i.e. the honey bee)**
- 2. Monitoring pest presence and abundance**
- 3. Using pest thresholds to determine the need for timing of treatment**
- 4. Implementing appropriate solutions to manage pests and diseases**





Signs of viral infections:

- Weak colony
- Increased numbers of dead and dying bees and/or brood
- Bees that appear to be trembling and uncoordinated
- Hairless, shiny, greasy-looking adult bees
- Newly emerged bees with opaque undersized appearance
- Small-bodied adults with shriveled, malformed wings





To Test or not to Test,
that is the question.





SEE NO EVIL?

Visual inspection for varroa mites on adult bees
and brood is NOT effective monitoring.





CONSISTENT MONITORING

Use the same monitoring methods throughout the season, and keep a record of the results.





WHAT ARE THRESHOLDS?

Thresholds are guidelines that assist the beekeeper in making decisions about when and what to treat. No threshold is absolute; it is a warning that intervention may be needed.





Treatment Thresholds by Phase

(%=Number of mites/100 adult bees)

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

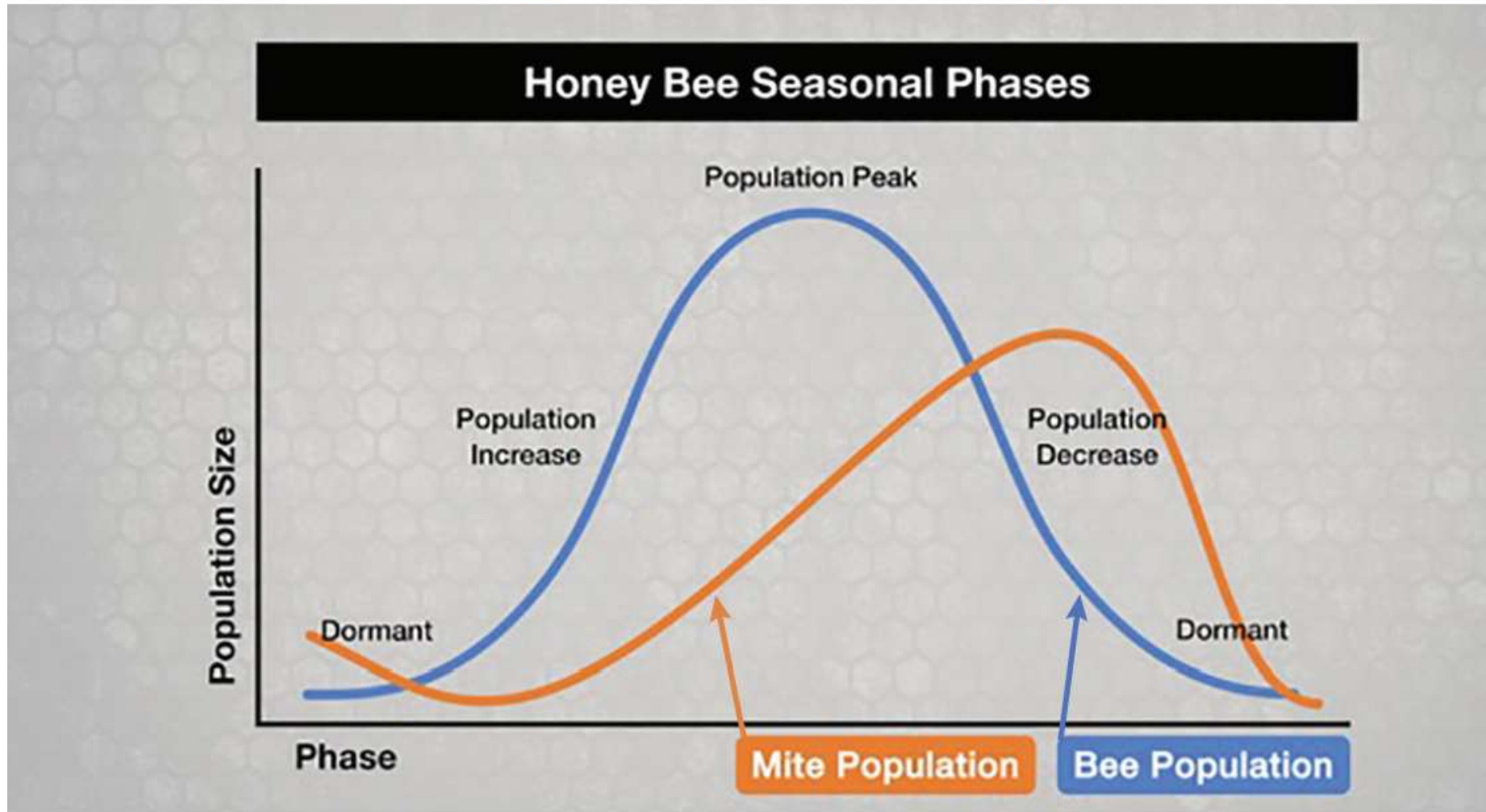
Acceptable: Current mite populations are not an immediate threat.

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





Figure 1: Varroa Mite Life Cycle



For details on the Varroa Life Cycle consult:

www.extension.org/pages/65450/varroa-mite-reproductive-biology





Mite Treatment Comparisons				
8/28/2022				
Treatment	Formic Pro	Apiguard	Oxalic Acid Vapor	Oxalic Acid Dribble
Natural	Yes	Yes	Yes	Yes
Mode	Fumigant	Fumigant	Fumigant	Contact
Min Treatment Time	1x in 2 weeks	2x in 4 weeks	1x in 1 week	1x in 1 week
With honey supers on?	Yes	No	No	No
With brood present?	Yes	Yes	No	No
Temperature restriction?	Yes, day >50F and <85F	Yes, > 59F and <105F	None	None
Other	Don't use if feeding	Don't use if feeding	None	None
Effectiveness	83 - 97%	74 to 95%	82 - 99%	82 - 99%
Best time to use in SW OH	Sep	Aug thru Sep	Oct thru Feb	Oct thru Nov
Cost for chemical	\$70 for 10 hives	\$26 for 4 hives	\$16.95 for 1 Lb or 450 hives	\$16.95 for 1 Lb or 650 hives
Cost for equipment	\$80 for gloves, glasses and respirator	\$80 for gloves, glasses and respirator	\$340 for vaporizer, respirator, battery, charger, gloves and glasses	\$40 for syringe, gloves and glasses





Observations:

Q) What months brood **will not** be present?

A) November, December, January, February.

Hence, these months are a good time to use **oxalic acid**, either vaporization or dribble. If dribble is to be used, select a day with temps above 40F.

Effective testing is a problem in these months.





Observations:

Q) What months will honey supers be present?

A) April, May and June to capture best nectar flow.

Hence, these months you may use Formic Pro, but if you treated in February with oxalic acid waiting until July after your supers are off is prudent. However, temps above 85F should be expected.





Observations:

Q) What to do if temps will be above 85F after you place Formic Pro in your hive?

A) Increase ventilation in hive. If you have a winter candy board frame, use this to increase air circulation. Alternatively, place the top hive an inch or so back from bottom box providing a gap.





An Integrated Pest Management Plan

1. On a warm day in February, use oxalic acid vaporization.
 - Advantage, no need to open hive and break propolis seals and disturb bees.
 - Disadvantage, no testing so risk of treating unnecessarily.
1. First week after removing honey supers in July, test for mites. If treatment needed, use Formic Pro.
 - Advantage, will penetrate brood cappings when mite levels are likely to be nearing highest levels.
 - Disadvantage, temperatures likely to exceed 85F, so intervention also likely.
2. On a day in late October or November, test for mites. If treatment needed, use oxalic acid dribble.
 - Advantage, fast with no need to move frames.
 - Disadvantage, with no brood present testing is unreliable.





IPM Example

1. February (month No. 2), use oxalic acid vaporization.
2. July (month No. 7), use Formic Pro.
3. October (month No. 10), use oxalic acid dribble.





Cultural and Mechanical Practices

- Deal with sick hives promptly.
- Don't combine a sick colony with a strong one.
- Isolate sick or weak colonies.
- Use cultural management techniques to help reduce pest threats.
 - Screened bottom boards
 - Drone brood removal
 - Brood interruption methods
 - Darkened, old comb removal





Genetic Practices

- Employ young, healthy queens.
- Use tested, proven hygienic stock; buy queens and bees from a reliable source.
- Buy locally, if reliable sources are available that demonstrate desired characteristics.





These signs indicate more frequent monitoring may be needed:

- Decreased colony productivity
- Abnormal or spotty brood pattern
- Abnormal adult behavior (e.g., trembling, twitching, reduced flight activity, robbing)
- Excessive number of dead or discolored, sick, greasy-looking adult bees inside or outside the hive
- Visual sightings of other pests or disease symptoms
- Deformed adult wings and/or brood bodies
- Failure to use supplemental food and/or lack of "normal" honey/bee bread reserves





Chemical Controls

- Alternate between different chemical controls when possible; don't rely on any single product to continuously treat for a pest or disease.
 - Follow label directions; both over-treatment and under-treatment can lead to resistance. Failure to follow the label may also result in non-effective treatments.
 - Only apply treatments within the appropriate temperature range listed on the label.
 - Both synthetic and organic chemicals are available to treat many pests.





Synthetic Miticides

- Apivar[®] (amitraz)
- Apistan[®] (fluvalinate) Not recommended. Varroa mites are resistant to fluvalinate in most of North America.*
- CheckMite+[®] (coumaphos) Not recommended. Varroa mites are resistant to coumaphos in most of North America.*





Organic Miticides

- Essential Oils
 - Apiguard[®] or Thymovar[®] (Canada) (thymol)
 - Api Life Var[®] (thymol + eucalyptol, menthol, and camphor)
- Acids
 - Mite-Away Quick Strips[®] [MAQS[®]] of Formic Pro[®] (formic acid)
 - Formic Acid 65%
 - Oxalic Acid
 - HopGuard[®] II (hops beta acids)





Cultural and Mechanical Practices

- Drone brood removal
- Brood interruption (includes splits, nucs, indoor overwintering)
- Sanitation (comb culling/biosecurity)
- Screen bottom board
- Heat (106°F (41°C) for four hours) or MiteZapper®





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How to Use Formic Acid to Treat Varroa Mites



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How to Use Oxalic Acid to Control Varroa Mites



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How to Use Oxalic Acid to Control Varroa Mites



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How to Treat Varroa with Essential Oils: Apiguard, Api...



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Introduction to Varroa Mites and Integrated Pest...



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Will varroa mites kill my bees?



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How to Sample for Varroa Mites: Two Methods







Ads · Shop apiguard



Dadant
Apiguard Tub
3 Kg
\$128.95
Dadant



Apiguard 6.6
Pound Pail
\$130.95
Betterbee



Apiguard ONE
Box of Ten
50g Trays - ...
\$43.90
Amazon.com
Free shipping



Dadant
Apiguard Foil
Pack - 10...
\$49.50
Dadant



Apiguard
\$28.95
Mann Lake



Apiguard 10
Pack
\$40.85
Betterbee



Apiguard
\$144.95
Mann Lake



Dadant Apivar
- 10 Pack
\$43.95
Dadant





Ads · Shop formic pro



10 Dose
Formic Pro

\$59.95
Betterbee



Dadant Formic
Pro - 10 Dose

\$69.95
Dadant



Dadant Formic
Pro - 30 Dose

\$164.95
Dadant



2 Dose Formic
Pro

\$17.95
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Dadant Formic
Pro - 2 Dose

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Formic Pro -
Varroasis
Treatment

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NOD Apiary
Products
Formic Pro

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Free shipping





Ads · Shop oxalic acid beekeeping



Dadant Oxalic Acid 35 G

\$8.95
Dadant



Oxalic Acid Crystals | For Bees 500...

\$28.00
Lab Alley



Oxalic Acid [C2H2O4] 99.8% ACS...

\$9.99
Amazon.com



Api-Bioxal (Oxalic Acid)

\$10.95
Mann Lake



Stone Pro Oxalic Acid SP-P-OX3

\$17.00
Diamond To...
🚚 Get it by ...



Oxalic Acid (2.5 lb)

\$19.99
Amazon.com
Free shipping



Oxalic Acid Crystals | For Bees 1...

\$44.00
Lab Alley



Oxalic Acid Kit

\$22.95
Betterbee



OXALIC ACID 99.6% 2 Lb. Deck,...

\$15.85
Amazon.com





The University of Guelph Honey Bee Research Center
Varroa Mite Control – Formic Pro
Varroa Mite Control – Oxalic Acid
Varroa Mite Control - Apivar

