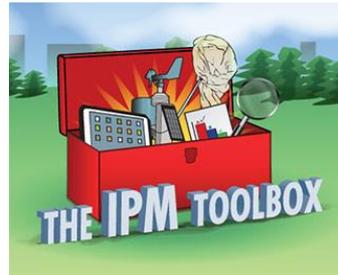




Varroa Mite IPM Series

Part 3: Varroa Mite IPM: Management Tools



Webinar Details

☼ Welcome

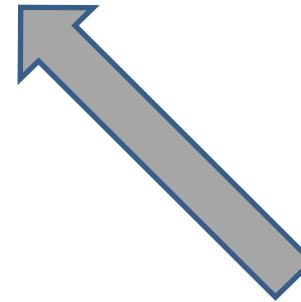
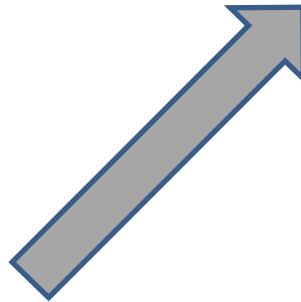
☼ A recording of this webinar will be available within a week at

☼ <http://www.neipmc.org/go/ipmtoolbox>

We Welcome Your Questions

- 🌻 Please submit a question **at any time** using the Q&A feature to your right at any time
- 🌻 If you'd like to ask a question anonymously, please indicate that at the beginning of your query.

Webinar Presenters



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Some Questions For You



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Outline

- 🐝 Varroa Mite Integrated Pest Management (IPM) Overview
- 🐝 IPM Tools – When, What, How
 - 🐝 Preventative
 - 🐝 Interventive
- 🐝 Future Webinars





VARROA MITE INTEGRATED PEST MANAGEMENT (IPM)





Principles of Varroa Mite

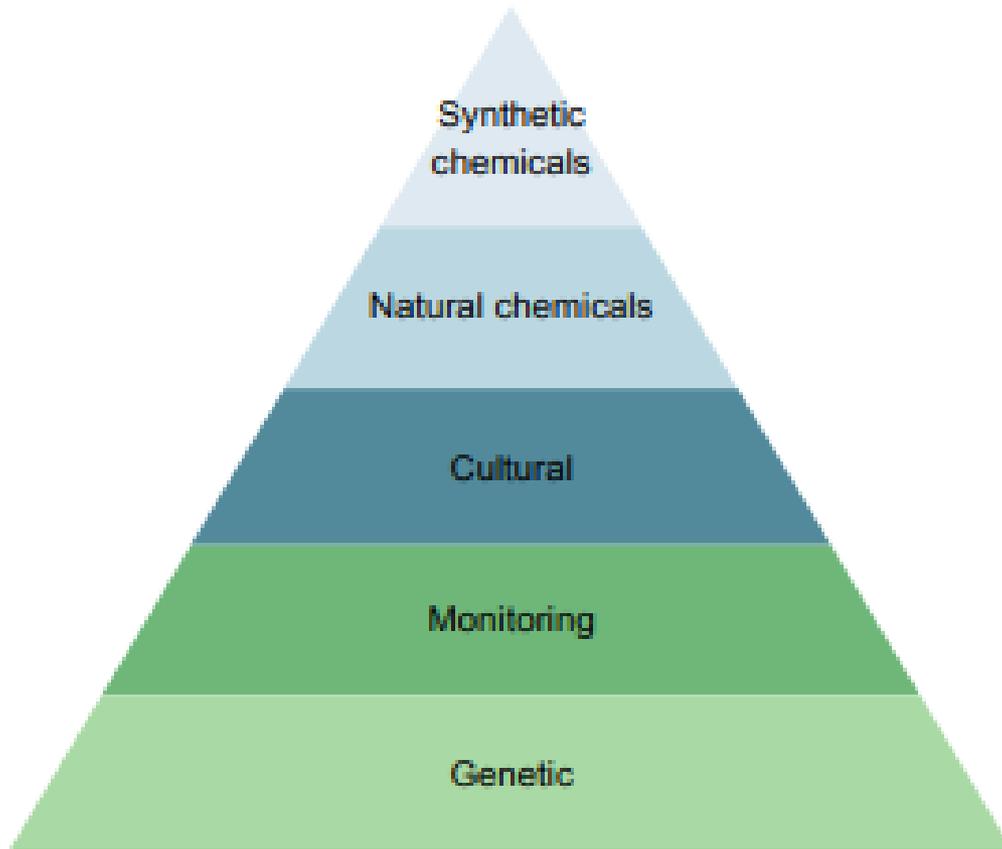


Integrated Pest Management (IPM)

- 1) **Bee Knowledgeable!** Know bee & mite (pest) **biology**
- 2) **Bee-a-Keeper!** Monitor hives frequently to determine **mite levels** & compare with established threshold
- 3) **Bee Active!** Use an “integrated” management approach consisting of **prevention (non-chemical/cultural)** then **intervention (chemical)** tools
- 4) **Bee Prepared!** Establish an **IPM Plan** for your Apiary before the season starts

What Is Varroa Mite IPM?

Pyramid of IPM Practices



Varroa Life Cycle Reminders

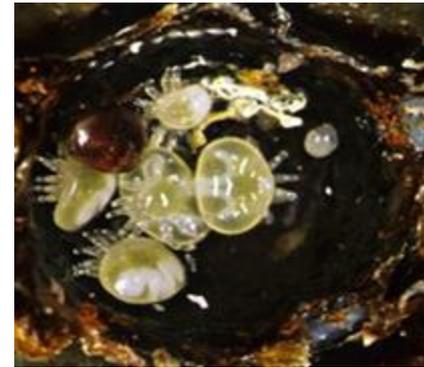
I. Dispersal:

- ❖ Prefer nurse bees – proximity to brood, extra nutrition for feeding



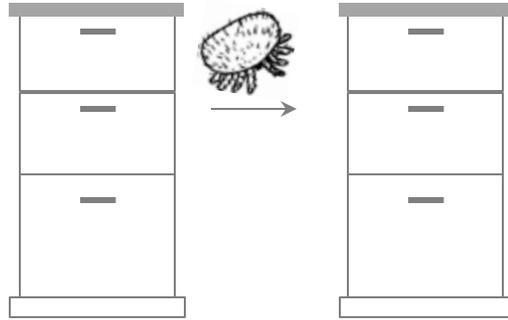
II. Reproductive:

- ❖ Mature female mites:
 - ✓ Reproduce up to 7 cycles in different cells
 - ✓ Infest cells with other mature females to increase population genetics
 - ✓ Avoid queen cells due to odor & short development time
 - ✓ Prefer drone cells due to history of reproduction with *A. cerana*

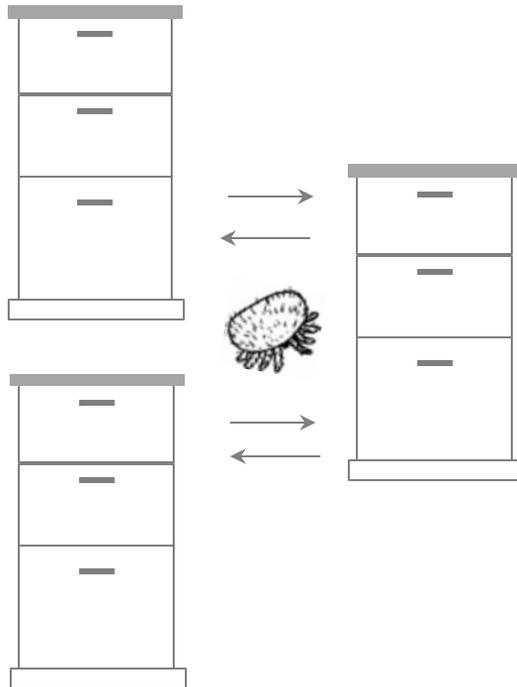


Varroa Mite Spread – Dispersal Stage

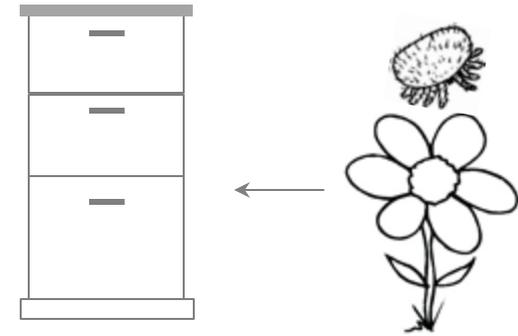
1. Drifting



2. Robbing



3. Flower



(Peck, Smith, Seeley, 2016)





QUESTION 1: SHOULD I MANAGE VARROA MITES?



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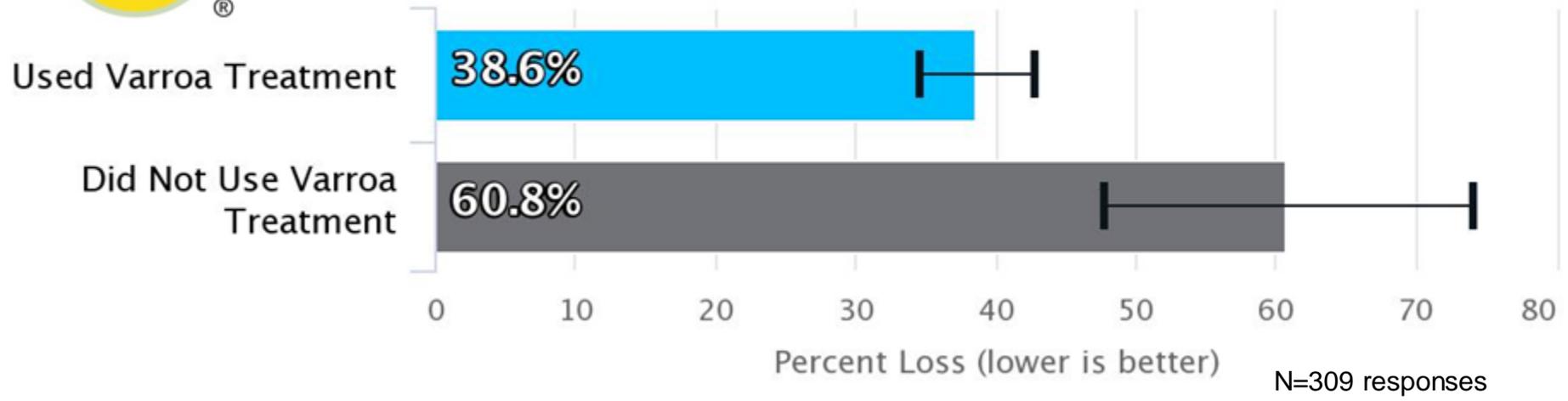
YEAR/ SAMPLE SIZE	Treated for Varroa		Did not Treat for Varroa		Prevention Only		Intervention Only		Prevention and Intervention	
	n	%	n	%	n	%	n	%	n	%
2016/2017	137	40.3	30	76.2	5	81.5	99	39.1	38	40.6
2017/2018	187	41.6	25	77.6	3	83.3	140	42.3	44	38.9
2018/2019	314	43.9	35	76.3	7	86.7	227	47.0	87	37.5

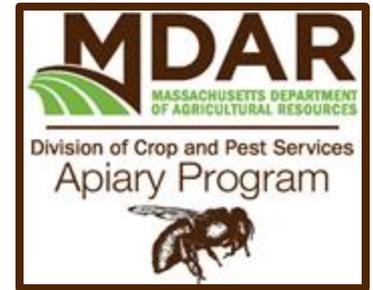


Average Winter Loss per Beekeeper

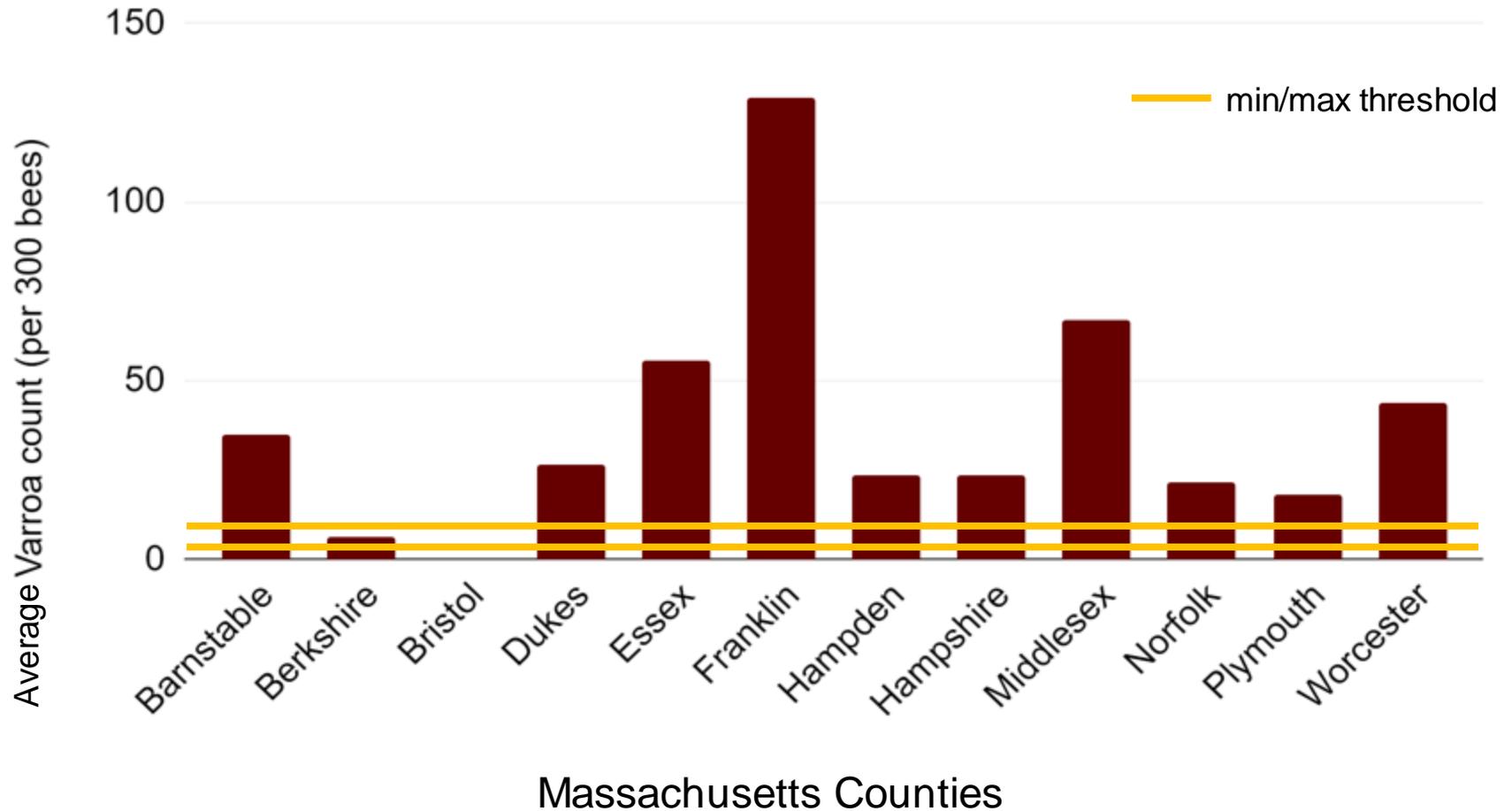
2018–2019 – New England-ish States: CT, MA, ME, NH, NY, RI, VT

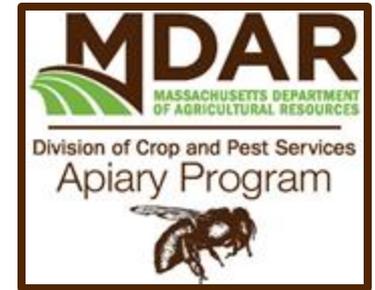
Used Varroa Treatment



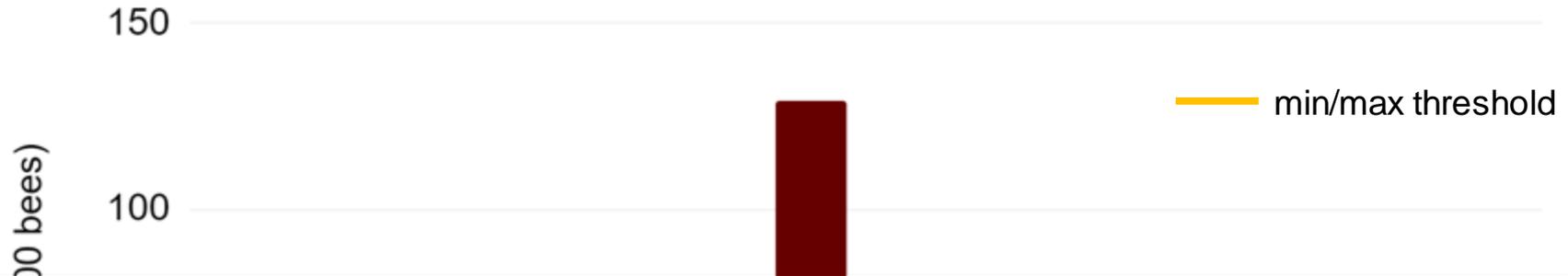


2019 Dead-Out Hive Evaluation (N=74 hives)





2019 Dead-Out Hive Evaluation (N=74 hives)



January–March 2019 Data:

- 74 Dead-out hives sampled
- Varroa Mite Levels (per/300 bees):
 - ❖ Min = 0
 - ❖ Mean = 33.53
 - ❖ Max = 323.10

*YES! Hives may only survive at
most 2 years if left
unmanaged*



QUESTION 2: WHEN SHOULD I MANAGE VARROA MITES?

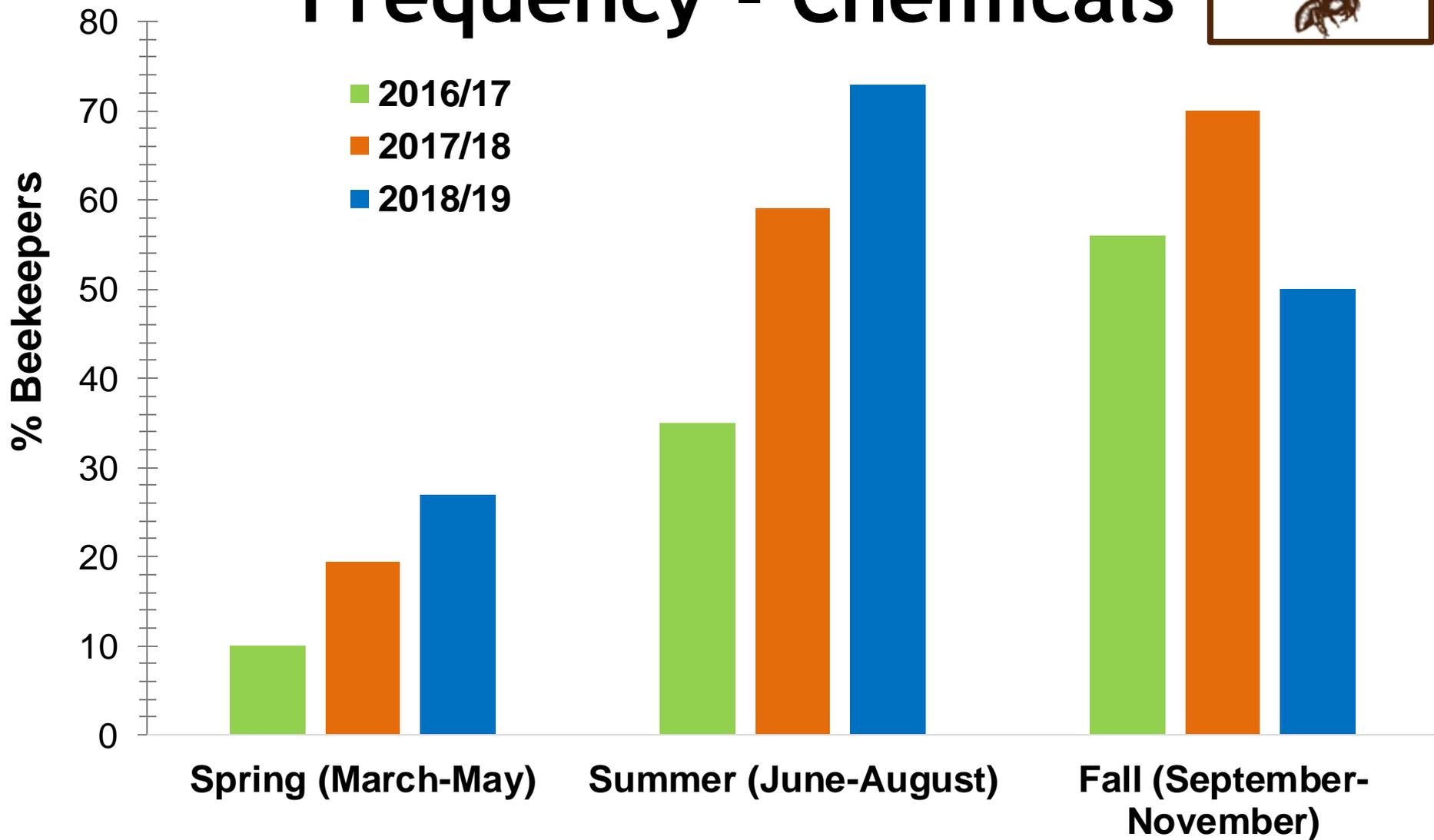


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Varroa Mite Treatment Frequency - Chemicals



Varroa Mite Treatment Frequency - Chemicals



Sample, Then Decide...

- ❖ Overwintered hive: early Spring/once bees are active/temp safe to enter hive box
- ❖ Packages: at install (ask supplier), within month after/first brood cycle
- ❖ Nucs: at install (ask supplier), within month after/first brood cycle
- ❖ Split: at install if no check from original hive, within month after/first brood cycle
- ❖ Swarm/Cut-out: at install, within month after/first brood cycle
- ❖ ALL: minimum 1x per month, check brood cycle/population build-up



Sample, Then Decide.....

Consider treatment if sample count is greater than:

- ❖ 1 Varroa mite / 100 bees OR (1%);
- ❖ 3 Varroa mites / 300 bees OR (1%);
- ❖ 3 Varroa mites / 0.5 cup bees (1%)



Thinking it is not possible to get 1% in your apiary? *Ok, then get it as low as possible (~2%) to increase chance of maintaining a healthy hive!*

QUESTIONS



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QUESTION 3: WHAT SHOULD I USE TO MANAGE VARROA MITES?



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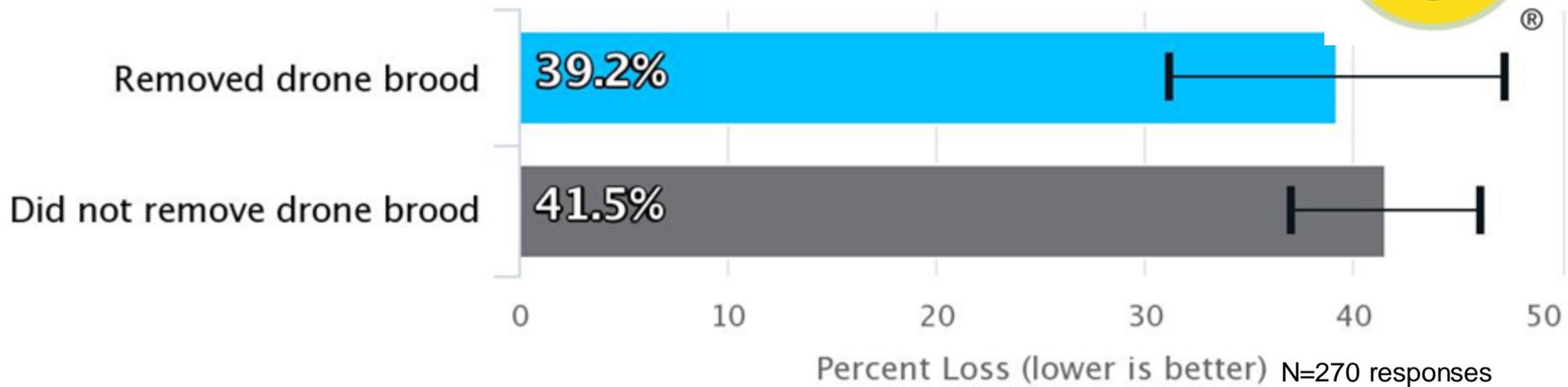


1. PREVENTION

Average Winter Loss per Beekeeper

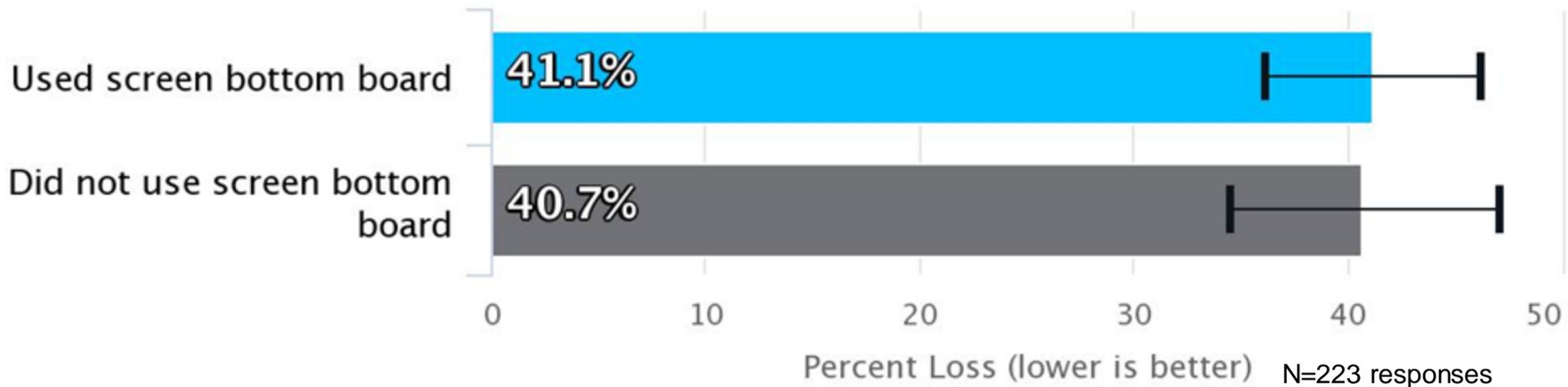
2018–2019 – New England-ish States: CT, MA, ME, NH, NY, RI, VT

Drone Brood Removal



Average Winter Loss per Beekeeper

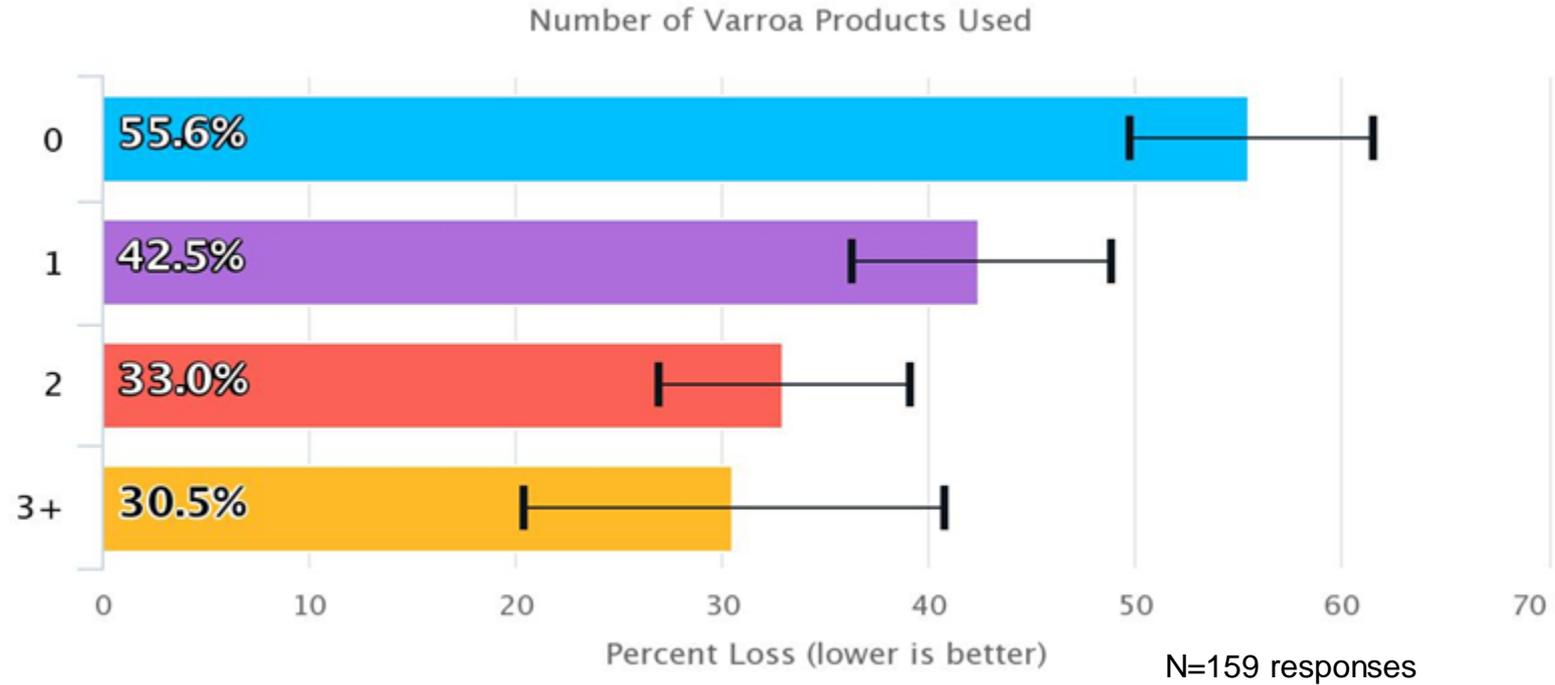
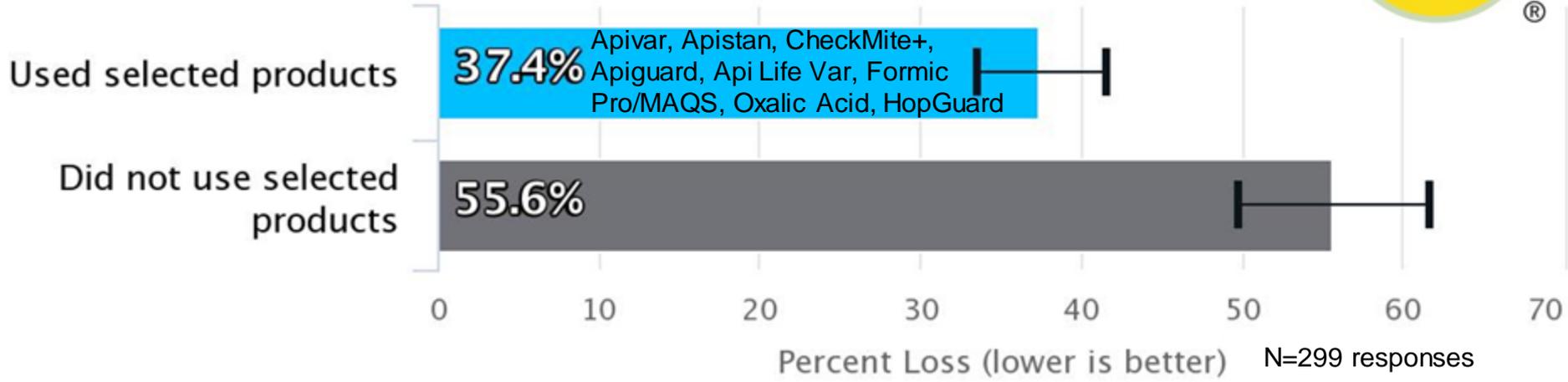
Screen Bottom Board Use



2. INTERVENTION

Average Winter Loss per Beekeeper

2018–2019– New England-ish States: CT, MA, ME, NH, NY, RI, VT
Varroa Products Used





Varroa Mites/Viruses

2018/2019

Prevention:

- Screen bottom boards (27.7%)
- Brood disruption (5.9%)

Intervention:

- Oxalic acid (vaporization, 48.0%)
- Mite-Away Quick Strips (formic acid, 26.5%)
- Formic Pro (formic acid, 23.7%)

No varroa management was reported by 9.7%



Gilles San Martin

Evaluate, Then Decide...

- ❖ Check outside temperature
- ❖ Determine brood presence/type
- ❖ Population size in hive – increasing, decreasing, dormant
- ❖ Honey supers
- Select best tools – not one, multiple:
 - Prevention: Non-Chemical tools
 - Intervention: Chemical tools
 - ❖ PPE
 - ❖ Mode of Action



Varroa Mite Management Tools

PREVENTION

- ❖ Non-Chemical Tools
- ❖ Year Round
- ❖ Many options:
 - Drone brood trapping/removal
 - Screened bottom board
 - Brood interruption/disruption /split
 - Re-Queen/Cage queen
 - Genetics

INTERVENTION

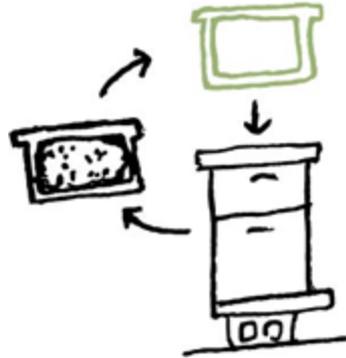
- ❖ Chemical Tools
- ❖ As needed after sampling



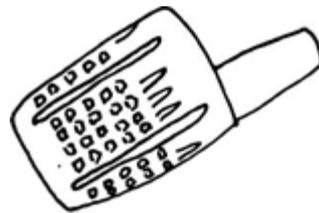
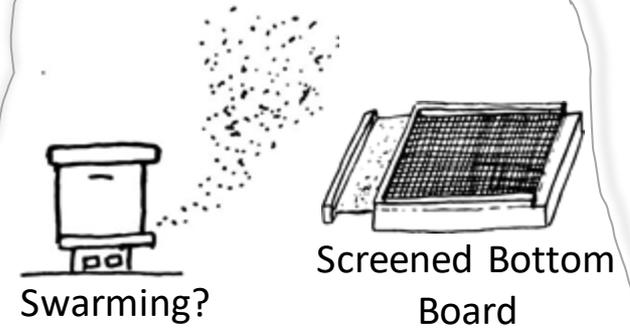
Non-Chemical Tools – YEAR ROUND



Drone Brood Removal

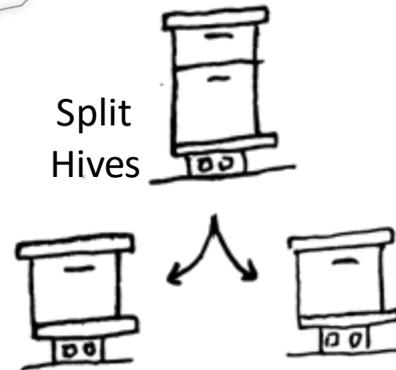


Brood Break



Cage Queen

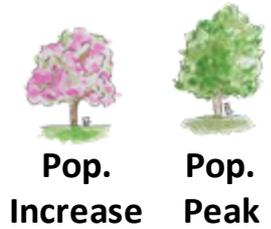
Split Hives



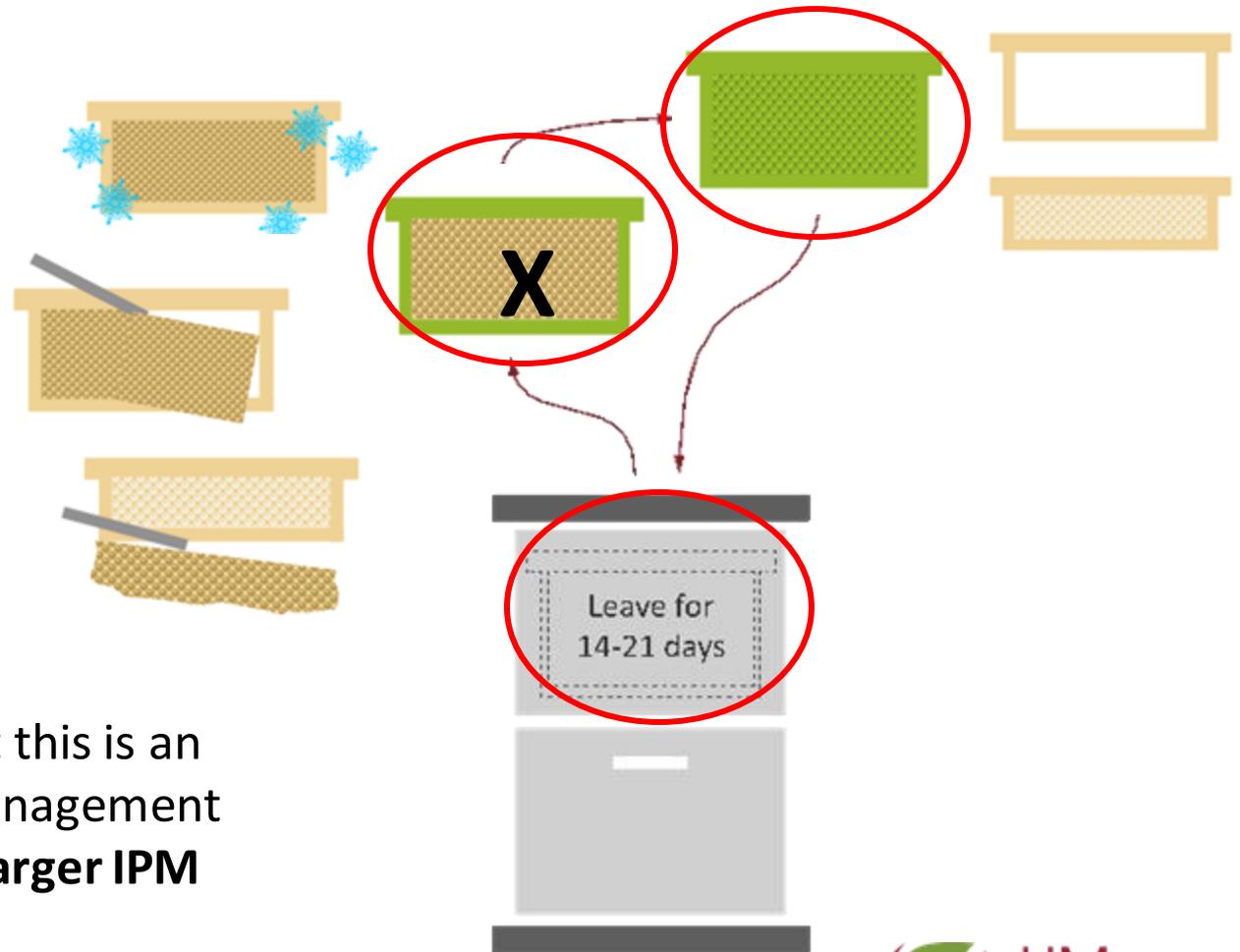
Re-Queen/Genetics



Drone Brood Removal



- ❖ Mites are **8–10x** more likely to invade drone cells
- ❖ As many mites emerge from **50–60 drone cells** as **1,000 worker cells**
- ❖ Studies show that this is an **effective** mite management tool as **part of a larger IPM strategy**

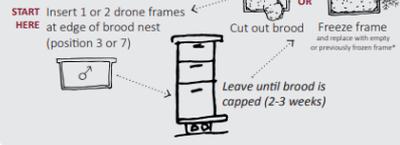


Drone Brood Removal For *Varroa* Mite Control

Drone brood removal (DBR) is a **proactive** mite management tool that you should use **before** mites become a problem. It is a common springtime practice in parts of Europe. Mites are >10x more likely to invade drone cells than worker cells, and produce more offspring in drone cells; so adding and removing a drone frame (or two) is an efficient way to bait, trap and destroy mites. **Plan on removing drone brood regularly in the spring and early summer.** In mid or late summer, when drone production slows, simply remove the drone frames, or move them to the outer edge of the hive, where the bees will fill them with nectar.

Studies show that DBR is one of the most effective non-chemical ways to reduce mites. However, it is not a silver bullet: check your mite levels using an alcohol wash once a month, and plan on treating chemically if mite levels exceed the treatment threshold (for more info on treating, check out <https://honeybeehealthcoalition.org/varroa/>).

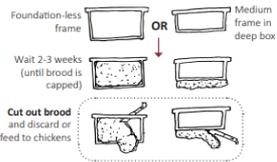
HOW TO REMOVE DRONE BROOD (the basics):



- TIPS**
- Not good for weak hives - often won't produce drones
 - Use a calendar and keep good records!

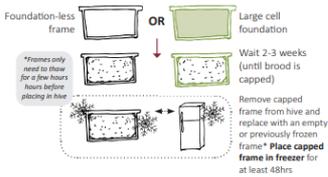
Cutting Version⁴

Commonly used in Europe in the spring
PROS: No equipment to carry; Logistically easy
CONS: Bees need to re-build wax. Can only use in spring and early summer.

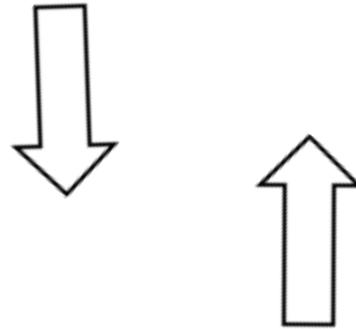


Freezing Version⁵

PROS: Wax is not destroyed; Can use in mid-summer
CONS: Requires freezer space. Logistics of swapping frames between freezer and field adds an extra step



References
 1. Sauerwein, Vincent, Francesco Nanni, Stephen J. Martin, Denis Lindenberg, Barbara Colzani, Math B. Sabelis, Quanty Wiskerman, et al. "Standard Methods for Varroa Research." *Journal of Apicultural Research* 52, no. 1 (January 2013): 1-54.
 2. Bock, M., J. C. C. de Graaf, M. B. G. van der Vliet, and G. van der Vliet. "Removal of Drone Brood from the Brood Nest of the Honey Bee, *Apis mellifera* L." *Apiculture* 46, no. 2 (2010): 200-04.
 3. Hoffmann, Christian, and Christian Hoffmann. "Removal of Drone Brood from the Brood Nest of the Honey Bee, *Apis mellifera* L." *Apiculture* 46, no. 2 (2010): 200-04.
 4. Chavakis, Ines, Daniel Aronson, and Sara Bachiler. "The Removal of Capped Drone Brood: An Effective Means of Reducing the Infestation of Varroa Mites in Honey Bees." *Basic and Applied Bee Research* 40 (January 2018): 112-20.
 5. W. Hoffmann. "The Removal of Drone Brood from the Management of Varroa Destructor (Hymenoptera: Varroidae) in Colonies of *Apis mellifera* (Hymenoptera: Apidae) in the UK United Kingdom." *Journal of Economic Entomology* 96 (June 2003): 445-53.



Breaking Bread or Brood...

- ❖ Divide colony into multiple separate colonies
- ❖ Manage swarming to prevent or split before swarm
- ❖ Cage queen for 1–2 weeks to disrupt egg-laying/interrupt brood rearing
- ❖ Tips:
 - Practice queen locating & handling skills
 - May need extra equipment – hives and queen cages
 - Time splits to coincide with floral resource availability – could differ per region/weather
 - Acquire extra queens for splits if late season or queen rearing not possible
 - Can combine splits later in season, if needed

Chemical Tools = Pesticides

- ❖ Substances intended to be used for preventing, destroying, repelling, or mitigating pests
- ❖ Examples of Common Types:
 - Insecticide – insects
 - **Miticides – mites [YES, includes Varroa mites]**
 - Herbicide – weeds
 - Fungicide – fungi
 - Rodenticide – rodents
- ❖ Pesticides are registered by EPA then locally by individual states before legally being sold or distributed for use





QUESTION 4: APPLYING MITICIDES TO YOUR HIVES?



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*If yes, then you are a Pesticide
Applicator –
Miticides are Pesticides NOT
Medications!*



QUESTION 5: APPLYING MITICIDES TO OTHER'S HIVES?



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*If yes, then may need a
Pesticide Applicator License –
check with state to find out*

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State Pesticide Regulatory Agencies

Go directly to the map

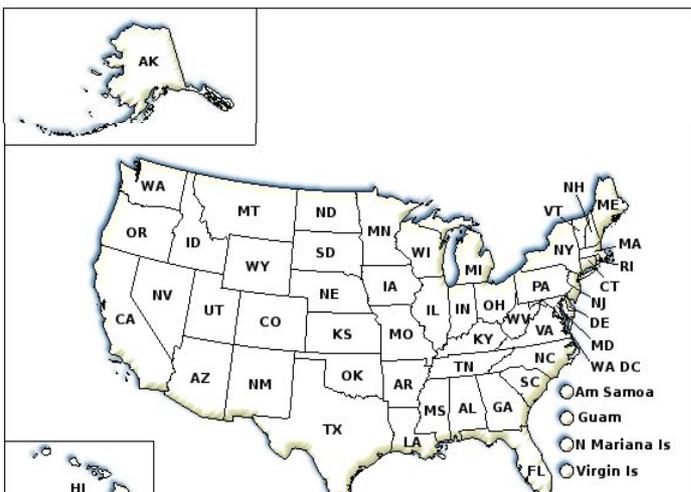
In each **state**, one agency works cooperatively with the US EPA to enforce federal pesticide regulations and respond to potential complaints. Click your state below to find their contact information.

On **tribal land**, pesticide regulations may be enforced by a tribal designee or by the US EPA. On US military installations, the **Armed Forces Pest Management Board** (AFPMB) serves as a first-stop for people with questions or complaints about pesticides.

It is important to consult with your state pesticide regulatory agency in the following circumstances:

- To inquire if a pesticide is registered for use in your state
- To find out more about the rules and regulations governing pesticide use in your state
- To find out if your state **requires notification** or postings prior to pesticide applications
- To register a complaint concerning a pesticide misapplication
- To find out how to become a certified pesticide applicator
- To report a pesticide exposure or misuse at work

Click on a state below to view the agency information for that state:



Related Topics:

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- [Natural and Biological Pesticides](#)
- [Repellents](#)
- [Rodenticides](#)
- [Other types of pesticides](#)

[Disponible en español](#)

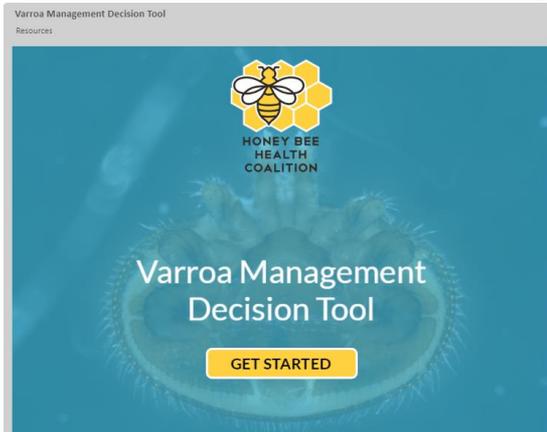


BEST MANAGEMENT PRACTICES FOR BEE HEALTH

BEST MANAGEMENT PRACTICES FOR BEE HEALTH

A Guide for Beekeepers

Every beekeeper should seek to have hives that are healthy and productive. Today, the many threats to honey bee health — including parasites, pests, disease, pesticides, and inadequate nutrition — make achieving this goal a major challenge. Successful beekeeping means closely monitoring bee health and taking proactive steps to protect them.



Meet The Varroa Mite...



The Varroa Mite, *Varroa destructor*, is an external parasite that attacks adult and immature stages (brood) of honey bees. These mites weaken bees and can transmit viruses during the feeding process.

Common signs of mite damage include:

- 1) open or damaged pupal cells;
- 2) holes in pupal cappings;
- 3) emerging adult bees with deformed or missing wings; and
- 4) visible mites on bees/brood.

Unmonitored and untreated infestations of Varroa mites can result in colony death. Colonies should be routinely monitored so informed management decisions can be made about population levels, treatment methods and efficacy. To obtain the best results, incorporate a range of the chemical and cultural Integrated Pest Management (IPM) methods listed in this brochure.

10 Steps To Doing An Alcohol Mite Wash

MATERIALS NEEDED:

- dishpan
- ½ cup measuring device
- ½ cup 70% rubbing alcohol
- mite wash jar

DIRECTIONS:

1. Inspect honey bee colony to remove a single frame that contains open brood and adult bees. Make sure the queen is not on the frame.
2. Shake worker bees from this frame into the dishpan.
3. Quickly scoop ½ cup of worker bees (~ 300 bees) from the dishpan and put into provided mite wash jar filled half-way with 70% alcohol.
4. Shake leftover live bees from the dishpan back into the hive.
5. Put the solid and mesh lids on jar and tightly seal.
6. Shake jar vigorously for 1-2 minutes to dislodge mites from submerged bees. Let jar sit for a few minutes to let mites dislodge.
7. Remove solid lid from jar, leaving mesh lid and tightly seal.
8. Pour the mixture of dead bees, mites and alcohol through the mesh lid over the empty dishpan to remove the mites and alcohol. Vigorously shake jar contents while pouring to ensure mites are dislodged.
9. Sift through the liquid debris to count the total mites. If the total number of mites ranges from 3-9, consider treatment options.
10. Discard bees. Alcohol can be re-used if mites are removed. Wash all re-usable materials after use.



Varroa Mite IPM



Integrated Pest Management (IPM) Options for Varroa Mites

NAME	ACTIVE INGREDIENT [CHEMICAL CLASS]	MODE OF ACTION	APPLICATION MATERIAL	APPLICATION SEASON & TEMPERATURE GUIDELINES	TREATMENT DURATION	KEEP HONEY SUPER ON?	NOTES
Apivar®	amitraz [amidine]	contact	plastic strip	Spring, Fall	42-56 days	no	honey supers put on 14 days after strip removal
Apistan®	tau-fluvalinate [pyrethroid]	contact	plastic strip	Spring, Fall [$>50^{\circ}\text{F}$]	42-56 days	no	mite resistance shown; honey supers put on after strip removal
CheckMite+®	coumaphos [organophosphate]	contact	plastic strip	Spring, Summer, Fall	42-45 days	no	mite resistance shown; do not use for queen-producing colonies
Apiguard®	thymol	fumigant	gel or gel tray	Spring, Fall [60°F to 105°F]	28-42 days	no	Restricted Entry Interval (REI) of 48hrs; honey supers put on after gel removal
Api Life Var®	thymol, menthol, eucalyptus oil	fumigant	tablet	Spring, Summer, Fall [64°F to 95°F]	26-32 days	no	honey supers put on 30 days after tablet removal
Mite-Away Quick Strips® (MAQS)	formic acid	fumigant	gel strip	Spring, Summer, Fall [50°F to 85°F]	7 days or 21 days	yes	penetrates wax cappings; check queen vitality after treatment
Formic Pro®	formic acid	fumigant	gel strip	Spring, Summer, Fall [50°F to 85°F]	14 days or 20 days	yes	penetrates wax cappings; check queen vitality after treatment
Oxalic Acid	oxalic acid dihydrate	contact, fumigant	vapor or liquid	Spring, Fall	varies by application type	no	most effective when brood-less
HopGuard®II	potassium salt of hops beta acids	contact	cardboard strip	Spring, Summer, Fall	30 days	yes	most effective when brood-less
Screen Bottom Board	cultural, non-chemical options for management	varies depending on management type		Spring, Summer, Fall, Winter	all year	yes	check mite drop for effectiveness
Drone Brood Trapping/Removal				Spring, Summer, Fall	14-20 days	yes	remove comb/open drone cells before emergence
Brood Interruption				Spring, Summer	14-20 days	yes	split hive or allow to swarm; but capture swarm
Re-Queen/Cage Queen				Spring, Summer	28 days	yes	select mite resistant stock when available

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.



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<https://www.northeastipm.org/ipm-in-action/publications/varroa-mite-ipm-brochure/>

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Varroa Mite IPM Brochure

Description: The varroa mite, *Varroa destructor*, is an external parasite that attacks adult and immature stages (brood) of honey bees. These mites weaken bees and can transmit viruses during the feeding process.

This brochure introduces the varroa mite, provides steps to doing an alcohol mite wash, and lists IPM options for controlling varroa mites.

Publisher: Massachusetts Department of Agricultural Resources; Maine Department of Agriculture, Conservation and Forestry.

Publication date: September 2018

Download link: Varroa Mite IPM (PDF)

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Varroa Mite IPM

Meet the Varroa Mite

The varroa mite, *Varroa destructor*, is an external parasite that attacks adult and immature stages (brood) of honey bees. These mites weaken bees and can transmit viruses during the feeding process.

Common signs of mite damage include:

- Open or damaged pupal cells
- Holes in pupal cappings
- Emerging adult bees with deformed or missing wings
- Visible mites on bees/brood

Unmonitored and untreated infestations of varroa mites can result in colony death. Colonies should be routinely monitored so informed management decisions can be made about population levels, treatment methods, and efficacy.

To obtain the best results, incorporate a range of the chemical and cultural integrated pest management (IPM) methods listed in this brochure.

Integrated Pest Management (IPM) Options for Varroa Mites



Name	Active Ingredient [Chemical Class]	Mode of Action	Application Material	Application Season & Temperature Guidelines	Treatment Duration	Keep Honey Super On?	Notes
Apivar*	amitraz [amidine]	contact	plastic strip	Spring, Fall	42-56 days	no	honey supers put on 14 days after strip removal
Apistan*	tau-fluvalinate [pyrethroid]	contact	plastic strip	Spring, Fall [$>50^{\circ}\text{F}$]	42-56 days	no	mite resistance shown; honey supers put on after strip removal
CheckMite+*	coumaphos [organophosphate]	contact	plastic strip	Spring, Summer, Fall	42-45 days	no	mite resistance shown; do not use for queen-producing colonies
Apiguard*	thymol	fumigant	gel or gel tray	Spring, Fall [60°F to 105°F]	28-42 days	no	restricted entry interval (REI) of 48 hrs; honey supers put on after gel removal
Api Life Var*	thymol, menthol, eucalyptus oil	fumigant	tablet	Spring, Summer, Fall [64°F to 95°F]	26-32 days	no	honey supers put on 30 days after tablet removal
Mite-Away Quick Strips* (MAQS)	formic acid	fumigant	gel strip	Spring, Summer, Fall [50°F to 85°F]	7 days or 21 days	yes	penetrates wax cappings; check queen vitality after treatment

Chemical Tools – TYPE

Synthetic Chemicals

Apivar



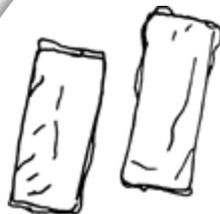
Apistan



CheckMite+

Natural Chemicals

Organic Acids

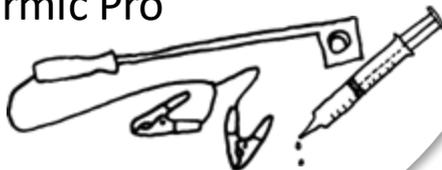


MAQS/Formic Pro

HopGuard III



Oxalic Acid/Api Bioxal



Essential Oils

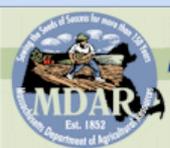
Apiguard



Api Life Var



Resistance
shown



This Massachusetts Pesticide Product Registration Information contained herein is supported by Kelly Registration Systems, Inc. and is intended for information purposes only. Pesticide applicators must determine if the product under consideration is correct for the intended use site.

About this Database... The data that supports these search features is derived from two different sources; the Massachusetts Department of Agricultural Resources and the National Pesticide Information Center. This information may not include State restrictions, such as those for products where there is concern for potential impacts to groundwater.

The Massachusetts Pesticide Product Registration Information database contains information on pesticide products registered in Massachusetts for the current year. Please include the pesticide product EPA Registration Number as well as product name with all inquiries.

Information contained in The Massachusetts Pesticide Product Registration Information is updated approximately once a month. For additional information see the About page.

Please select from the following options

[Search by Company Name](#)

[Search by Company ID](#)

[Search By Product Name](#)

[Search By Product EPA ID](#)

[Search By Pest](#)

[Search By Site](#)

[Search By Pesticide Type](#)

[Search By Formulation Type](#)

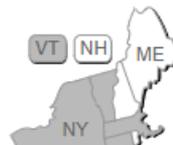
[Search By Active Ingredient](#)

[Search By Multiple Criteria](#)

[Search Restricted Use \(RUP\)](#)

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license information. For participating states, you may



Pesticide Product Registration Information

Home [KellySolutions.com](#) Search By: [Company Name](#) [Company ID](#) [Product Name](#) [Product EPA ID](#) [Active Ingredient](#) [Pest](#) [Site](#) [Formulation](#) [Pest-type](#) [RUP](#) [Multiple Criteria](#)



Products which will control: **Varroa Mite**

The site and pest data was supplied by the U.S. EPA., and may not accurately reflect the sites and pests on the label in your state. Please be sure to check the label for all products.

Product Name

[API LIFE VAR](#)

[Api-Bioxal](#)

[APIGUARD](#)

[APIVAR](#)

[CHECKMITE+ BEE HIVE PEST CONTROL STRIP](#)

[CHECKMITE+ BEE HIVE PEST CONTROL STRIP](#)

[FORMIC PRO](#)

[HOPGUARD II](#)

[HOPGUARD II \(END USE PRODUCT\)](#)

[MITE-AWAY QUICK STRIPS](#)

[Zoecon Apistan Anti-Varroa Mite Strip](#)



ATTENTION: Please check the 'Last Update' date on the federal and state data. Due to the social distancing and remote work going on around the country, we expect delays in getting the most up to date data. We want everyone to stay safe out there whether it is from COVID-19 or using unregistered pesticides. If you have questions about the data displayed, please contact the US EPA or the individual state pesticide registration department. We will be working hard to keep these websites available. If you have website issues, the best way to contact us is by email at: npirs@ceris.purdue.edu.

SEARCH FEDERAL PESTICIDE PRODUCTS

Search for federally active pesticide products using *one* of the following methods.

EPA Registration Number:

 -

Search by the two-part EPA registration number. You can copy/paste the complete EPA Registration Number into any of the boxes above.

Product Name:

Search by the full or partial product name.

Company Name:

Search by the EPA assigned company number or the full or partial company name.

Active Ingredient:

Search by the PC code, Chemical Abstract Services Number (CAS) or the full or partial chemical name.

Search

ATTENTION: Please check the 'Last Update' date on the federal and state data. Due to the social distancing and remote work going on around the country, we expect delays in getting the most up to date data. We want everyone to stay safe out there whether it is from COVID-19 or using unregistered pesticides. If you have questions about the data displayed, please contact the US EPA or the individual state pesticide registration department. We will be working hard to keep these websites available. If you have website issues, the best way to contact us is by email at: npirs@ceris.purdue.edu.

Product Report

Product Name Keyword: **Apivar**

Number of Active Products: **1**



View the label in the US EPA Pesticide Product Label System (PPLS).

APIVAR

EPA Registration Number: 87243-1 

Company Number: 87243

VETO-PHARMA SAS
12-14 RUE DE LA CROIX-MARTRE
91120 PALAISEAU
331/829-5007

Approval Date: 03-11-2013

Product Manager: Gene Benbow 703-347-0235

Percent	Active Ingredient
3.3300	Amitraz (106201)

QUESTIONS





QUESTION 6: HOW DO I APPLY MITICIDES?



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



*SAFELY, using Personal
Protective Equipment (PPE) –
read product labels to get
specific info!*

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND
DOMESTIC ANIMALS**

DANGER  **POISON**

Fatal if swallowed. Corrosive. Causes irreversible eye damage. Causes skin burns. May be fatal if absorbed through the skin. May be fatal if inhaled. Do not get on skin, in eyes, or on clothing. Do not breathe vapor or spray mist. Wear protective clothing, eyewear, and respiratory protection as listed under "Personal Protective Equipment."

PERSONAL PROTECTIVE EQUIPMENT:

Handlers and Applicators who apply product by the Solution Method must wear:

- Long-sleeved shirt and long pants
- Socks and shoes
- Chemical resistant gloves (barrier laminate, butyl rubber ≥ 14 mils., nitrile rubber ≥ 14 mils., neoprene rubber ≥ 14 mils., natural rubber ≥ 14 mils., polyethylene, polyvinyl chloride ≥ 14 mils, or viton ≥ 14 mils.)
- Protective eyewear such as goggles
- Half-face respirator with cartridge and/or particulate filter

Handlers and Applicators who apply product by the Vaporizer Method must wear:

- Long-sleeved shirt and long pants
- Socks and shoes
- Chemical resistant gloves (barrier laminate, butyl rubber ≥ 14 mils., nitrile rubber ≥ 14 mils., neoprene rubber ≥ 14 mils., natural rubber ≥ 14 mils., polyethylene, polyvinyl chloride ≥ 14 mils, or viton ≥ 14 mils.)
- Protective eyewear (goggles or face shield)
- Half-face respirator with cartridge and/or particulate filter

User Safety Requirements:

Follow manufacturer's instructions for cleaning/ maintaining PPE. If no such instructions are provided for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

Oxalic Acid Dihydrate

For Varroa mite control on bees

Active Ingredient:
Oxalic Acid Dihydrate:..... 97.0%
Inert Ingredients: 3.0%
TOTAL:..... 100.0%

KEEP OUT OF REACH OF CHILDREN

DANGER-PELIGRO **POISON**



ACCEPTED

Oct 13, 2015

Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 91266-1

FIRST AID

If swallowed	-Call a poison control center or doctor immediately for treatment advice. -Have person sip a glass of water if able to swallow. -DO NOT INDUCE VOMITING unless told to by the poison control center or doctor. -Do not give anything to an unconscious person.
If in eyes	-Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. -Call a poison control center or doctor for advice.
If on skin or clothing	-Take off contaminated clothing. -Rinse skin immediately with plenty of water for 15-20 minutes. - Call a poison control center or doctor for advice.
If inhaled	-Move person to fresh air. -If person is not breathing, call 911 or an ambulance, then give artificial respiration, if possible. DO NOT use mouth-to-mouth method if victim ingested or inhaled the substance, use respiratory medical device. -Call a poison control center or doctor for advice.

Look for Restricted Entry Interval – REI

For non-emergency information concerning this product, call the National Pesticides Information Center (NPIC) at 1-800-858-7378 seven days a week, 6:30 am to 4:30 pm Pacific Time (NPIC Website: www.npic.orst.edu).

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Provide general supportive measures and treat symptomatically. Treatment should be rapidly instituted by giving a dilute solution of calcium lactate, limewater, finely pulverized chalk, plaster, and/or milk to supply large amounts of calcium to inactivate oxalate by forming an insoluble calcium salt in the stomach. Gastric lavage is controversial, since this may compound an already severe corrosive lesion in the esophagus or stomach. However, if used, gastric lavage should be done with limewater (calcium hydroxide). Intravenous gluconate or calcium chloride solutions should be given to prevent hypocalcemic tetany; in severe cases parathyroid extract also has been given. Additionally, acute renal failure should be anticipated, and careful fluid management is necessary. Metabolically its toxicity is believed to be due to the capacity of oxalic acid to immobilize calcium and thus upset the calcium-potassium ratio in critical tissues. Effective therapy against burns from oxalic acid involves replacement of calcium.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ THIS LABEL: Read the entire label. This product must be used strictly in accordance with this label's precautionary statements and use directions, as well as with all applicable State and Federal laws and regulations.

USE RESTRICTIONS:

Oxalic Acid Dihydrate applications are for outdoor use only.

DO NOT use in enclosed overwintering areas.

Use only in late fall or early spring when little or no brood is present. Oxalic Acid Dihydrate might damage bee brood. Oxalic Acid Dihydrate will not control Varroa mites in capped brood.

Do not use when honey supers are in place to prevent contamination of marketable honey.

Apply only when monitoring indicates treatment is required. Consult state guidelines and local extension experts for monitoring protocols and thresholds for treatment.

(See next page for additional DIRECTIONS FOR USE)

**UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE, Bee Research Laboratory
10300 Baltimore Avenue, Bldg. 306, Rm. 315
BARC-EAST
Beltsville, MD 20705**

EPA Reg. No. 91266-1
EPA Est. No. 73291-NC-001
Net Contents: _____
Batch Code No.: _____

EPA Reg. No. 91266-1
page 1 of 2
Rev. 8/25/15



Personal Protective Equipment (PPE)



- ❖ READ and FOLLOW Label – *Label is Law!*
- ❖ Clothing – long-sleeved shirt, pants, socks and shoes
- ❖ Gloves – chemical resistant, specific type listed
- ❖ Protective eyewear – goggles, face shield, safety glasses
- ❖ Respirator – half-face, full-face

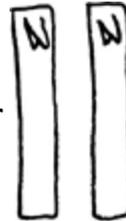


Chemical Tools – SAFETY

Gloves



Apivar



Apistan



CheckMite+

Gloves + Protective Eyewear

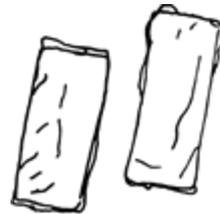


HopGuard III



Apiguard

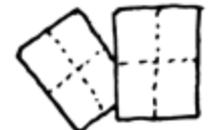
Gloves + Protective Eyewear + Respirator



MAQ/Formic Pro



Oxalic Acid/Api Bioxal



Api Life Var

Goggles



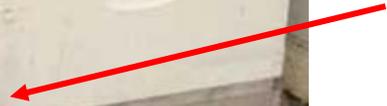
Respirator



~~Gloves~~



Plug
Entrance



Oxalic Acid





QUESTION 7: WHERE CAN I PURCHASE PROPER PPE?



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



*Check with bee supply, home
improvement, tool, and
chemical suppliers, may need
to get fit tested*



Integrating research
and outreach education
from UMass Amherst

For Faculty and Staff | Contact Info

- Home
- About
- Extension Outreach
- Research
- Resources
- Services
- Farms & Facilities
- News & Events

Search the Center for Agriculture, Food and the Environment

Search this site

Search

Resources

Pollinators



Pollinators

Overview

Swarm Removal

Honey Bees

Information for Beekeepers

What to Know Before Getting a Hive

Yearly Management

Pests and Diseases

Education

Respirator Training for Beekeepers (Multiple Dates and Locations)

[Printer-friendly version](#)

Event date/time:

Tuesday, March 19, 2019 - 8:00am

Respirator Train-the-Trainer Course for Farmers, Beekeepers, and other employees who need to use respirators.

For more info, and to register, click [here](#).

UMass Extension is offering a series of Respirator Train-the-Trainer workshops in 2019. Farmers, beekeepers and other who need to wear respirators, required by pesticide labels, can benefit from the workshop. Participants will learn how to fit test a respirator and select, use, clean, maintain and replace respirators. All handlers must be trained under the EPA Worker Protection Standard (WPS) Respirator Requirement if they apply any pesticide that requires a respirator. Several organic approved (OMRI) pesticides and some miticides used by beekeepers require respirators.

The respirator train-the-trainer workshops are 2 hours long and will be held in multiple locations throughout Massachusetts. Participants will receive a Certificate of Attendance, a check list for respirator training, and a fit test protocol. This is a hands on workshop. Bring your respirator or use one of ours.

For questions about this workshop please contact Natalia Clifton, UMass Extension, 413-545-1044 or email nclifton@umass.edu

<https://ag.umass.edu/pollinators/events/respirator-training-for-beekeepers-multiple-dates-locations>



QUESTION 8: WHAT CHEMICAL TOOLS ARE AVAILABLE?



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



Integrated Pest Management (IPM) Options for Varroa Mites

NAME	ACTIVE INGREDIENT [CHEMICAL CLASS]	MODE OF ACTION	APPLICATION MATERIAL	APPLICATION SEASON & TEMPERATURE GUIDELINES	TREATMENT DURATION	KEEP HONEY SUPER ON?	NOTES
Apivar®	amitraz [amidine]	contact	plastic strip	Spring, Fall	42-56 days	no	honey supers put on 14 days after strip removal
Api-Mite	tau-fluvalinate [pyrethroid]	contact	plastic strip	Spring, Fall [$>50^{\circ}\text{F}$]	42-56 days	no	mite resistance shown; honey supers put on after strip removal
Checkmate+	coumaphos [organophosphate]	contact	plastic strip	Spring, Summer, Fall	42-45 days	no	mite resistance shown; do not use for queen-producing colonies
Apiguard®	thymol	fumigant	gel or gel tray	Spring, Fall [60°F to 105°F]	28-42 days	no	Restricted Entry Interval (REI) of 48hrs; honey supers put on after gel removal
Api Life Var®	thymol, menthol, eucalyptus oil	fumigant	tablet	Spring, Summer, Fall [64°F to 95°F]	26-32 days	no	honey supers put on 30 days after tablet removal
Mite-Away Quick Strips® (MAQS)	formic acid	fumigant	gel strip	Spring, Summer, Fall [50°F to 85°F]	7 days or 21 days	yes	penetrates wax cappings; check queen vitality after treatment
Formic Pro®	formic acid	fumigant	gel strip	Spring, Summer, Fall [50°F to 85°F]	14 days or 20 days	yes	penetrates wax cappings; check queen vitality after treatment
Oxalic Acid	oxalic acid dihydrate	contact, fumigant	vapor or liquid	Spring, Fall	varies by application type	no	most effective when brood-less
HopGuard®II	potassium salt of hops beta acids	contact	cardboard strip	Spring, Summer, Fall	30 days	yes	most effective when brood-less
Screen Bottom Board	cultural, non-chemical options for management	varies depending on management type		Spring, Summer, Fall, Winter	all year	yes	check mite drop for effectiveness
Drone Brood Trapping/Removal				Spring, Summer, Fall	14-20 days	yes	remove comb/open drone cells before emergence
Brood Interruption				Spring, Summer	14-20 days	yes	split hive or allow to swarm; but capture swarm
Re-Queen/Cage Queen				Spring, Summer	28 days	yes	select mite resistant stock when available

This publication was funded by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.



United States
Department of
Agriculture

National Institute
of Food and
Agriculture

NOTIFICATION

87243-1

The applicant has certified that no changes, other than those reported to the Agency have been made to the labeling. The Agency acknowledges this notification by letter dated:

02/24/2020

Apivar[®]

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Strips for the in-hive control of mites (varroaosis) on honey bees

ACTIVE INGREDIENT:	
Amitraz: N-(2,4-dimethylphenyl)-N-[[2,4-dimethylphenyl]amino]methyl]-N-methylmethanimidamide	3.33%
OTHER INGREDIENTS:	96.67%
TOTAL:	100.00%

KEEP OUT OF REACH OF CHILDREN WARNING

FIRST AID	
IF ON SKIN OR CLOTHING:	<ul style="list-style-type: none">Take off contaminated clothing.Rinse skin immediately with plenty of water for 15-20 minutes.Call a poison control center or doctor for treatment advice.
IF SWALLOWED:	<ul style="list-style-type: none">Call a poison control center or doctor immediately for treatment advice.Have person sip a glass of water if able to swallow.Do not induce vomiting unless told to by a poison control center or doctor.Do not give anything by mouth to an unconscious person.
IF IN EYES:	<ul style="list-style-type: none">Hold eye open and rinse slowly and gently with water for 15-20 minutes.Remove contact lenses, if present, after the first 5 minutes, then continue rinsing.Call a poison control center or doctor for treatment advice.
IF INHALED:	<ul style="list-style-type: none">Move person to fresh air.If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.Call a poison control center or doctor for further treatment advice.
Have the product container or label with you when calling a poison control center or doctor or going for treatment. For TRANSPORTATION EMERGENCIES, call 24 hours a day CHEMTREC 1-800-424-9300. For MEDICAL EMERGENCY, call 24 hours a day ProPharma Group 1-866-257-2596. For PRODUCT USE Information, Call US Toll Free Number 1-800-903-2130.	

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FRANCE

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EPA Reg. No. 87243-1
EPA Est. No. 87243-FRA-001

Manufactured ~~by~~ ~~for~~,
Véto-pharma S.A.S.,
12/14 rue de la Croix-Martin,
91120 Palaiseau - FRANCE,
www.apivar.net

NOTIFICATION

87243-1

The applicant has certified that no changes, other than those reported to the Agency have been made to the labeling. The Agency acknowledges this notification by letter dated:

02/24/2020

Apivar®

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Amitraz: N-(2,4-dimethylphenoxy)-N-[[2,4-dimethylphenoxy]imino]methyl-N-methylmethanimidamide	3.33%
OTHER INGREDIENTS:	96.67%
TOTAL:	100.00%

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IF IN EYES:	<ul style="list-style-type: none"> Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.
IF INHALED:	<ul style="list-style-type: none"> Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.

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EPA Reg. No. 87243-1
EPA Est. No. 87243-FRA-001

Manufactured by [redacted] for [redacted]
Véto-pharma S.A.S.
12/14 rue de la Croix-Martin
91120 Palaiseau - FRANCE
www.apivar.net

APIVAR (EPA Reg. No. 87243-1)
MASTER LABEL, version dated February 24, 2020
Page 1 of 5

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Apivar® is a sustained-release plastic strip designed for use in beehives to control the parasitic mite (*Varroa destructor*) on honey bees.

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For varroa treatment - Remove honey supers before application of Apivar®. Use 2 Apivar® strips per brood chamber (i.e., one strip per 5 Frames of Bees - FoB).

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# FoB	≤5	6 - 10	11 - 15	≥16
# strips	1	2	3	4

Separate the double strip and hang each strip between two comb frames inside the brood area or the bee cluster, with a minimum distance of 2 frames between strips. Suspend Apivar® strips in the brood chamber in such a way that the bees can walk on both sides of the strips. Leave strips inside the hive for 42 days, and then remove. In case of movement inside the beehive far from the strips, reposition the strips into the bee cluster, and leave the strips in place for 14 more days. Strips must be removed after a maximum of 56 days. DO NOT re-use the strips.

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Timing:

Hang Apivar® strips in the hives in the spring and/or the fall if varroa mite infestations have reached treatment threshold. Remove all Apivar® strips 2 weeks before the honey flow starts.

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APIVAR (EPA Reg. No. 87243-1)
MASTER LABEL, version dated February 24, 2020
Page 2 of 5

DO NOT USE APIVAR® STRIPS WHEN HONEY SUPERS ARE PRESENT.

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If mite infestation reaches treatment thresholds in fall, remove surplus honey supers before using Apivar®.

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Withholding period for honey collection:

DO NOT USE APIVAR® STRIPS WHEN HONEY SUPERS ARE PRESENT. Wait 14 days after removing strips before placing honey supers on hive.

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Resistance management:

Any mite population may contain individuals naturally resistant to Apivar® and other similar miticides. The resistant individuals may dominate the mite population if this group of miticides is used repeatedly in the same location. Other resistance mechanisms that are not linked to site of action but are specific for individual chemicals, such as enhanced metabolism, may also exist. Appropriate resistance management strategies should be followed.

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To delay miticide resistance:

- Where possible, rotate the use of Apivar® or other similar miticides with different groups that control the same pests.
- Miticide use should be based on an Integrated Pest Management (IPM) program that includes scouting, record keeping, and considers cultural, biological and other chemical control practices.
- Correctly identify the pest and ensure economic and agronomic thresholds are met before treatment.
- Monitor treated pest populations for resistance development.
- Contact your local extension specialist or certified crop advisors for any additional pesticide resistance management and/or IPM recommendations for the specific site and pest problems in your area.
- For further information or to report suspected resistance contact your local extension specialist.
- Do not leave strips in colonies for greater than the designated 56 day maximum.

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RESTRICTIONS:

- For in-hive use only.
- Do not use Apivar® strips when honey supers are present.
- Maximum rate = 2 strips per brood chamber per application (i.e., one strip per 5 Frames of Bees - FoB).
- Remove honey supers before application of Apivar®.
- Remove Apivar® strips 14 days before placing honey supers.
- Strips must be removed after a maximum of 56 days.
- Do not re-use strips.
- Do not use Apivar® more than 2 times a year, i.e., no more than once in spring and once in fall.

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APIVAR (EPA Reg. No. 87243-1)
MASTER LABEL, version dated February 24, 2020
Page 3 of 5

Apivar



Pop. Increase



Pop. Decrease

Synthetic Chemical

Active Ingredient: 3.33% **Amitraz**

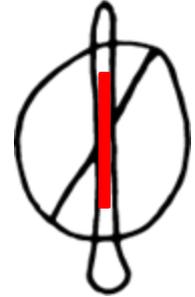
Mode of Action: **Contact**



Wear
Gloves

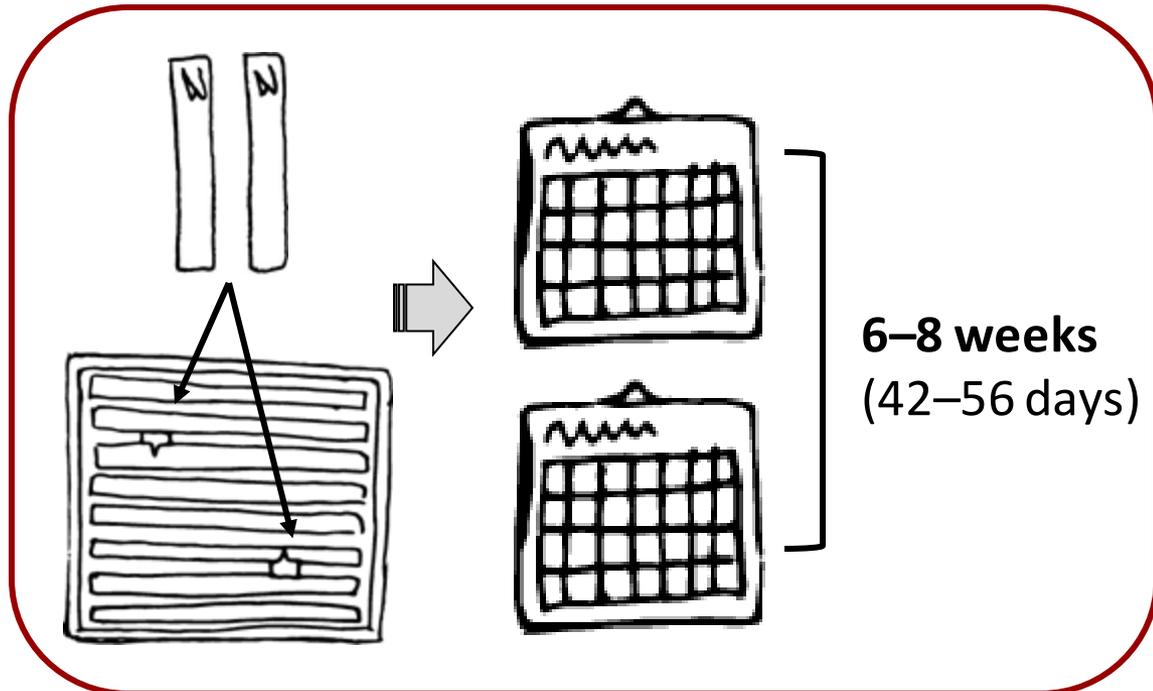


Cannot apply
with supers



Not Temp
Dependent

- ❖ Place **2 strips per brood** chamber, at least 2 frames apart
- ❖ Max 2x per year
- ❖ Wait 2 weeks after treatment to add honey supers



AFIGUARD

For treatment of varroosis due to *Varroa destructor* in honeybees.

ACCEPTED

11/13/2018

Under the Federal Insecticide, Fungicide
and Rodenticide Act as amended, for the
pesticide registered under
EPA Reg. No. 79671-1

Active Ingredient:

Thymol (CAS # 89-83-8)25%
Other Ingredients75%
Total: 100%

KEEP OUT OF REACH OF CHILDREN DANGER

FIRST AID	
If In Eyes	<ul style="list-style-type: none"> Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.
If Swallowed	<ul style="list-style-type: none"> Call poison control center or doctor for treatment advice. Do not induce vomiting unless told to do so by the poison control center or doctor. Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person.
If On Skin Or Clothing	<ul style="list-style-type: none"> Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
If Inhaled	<ul style="list-style-type: none"> Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.
HOT LINE NUMBER Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact CHEMTREC at 800-424-9300 for emergency medical information (24 hours).	

(See [leaflet inside the box/enclosed/side panels] for [entire label.] precautionary statements and directions before use.)

EPA Reg No. 79671-1

Batch or Lot Number: _____

EPA Establishment No. 083118-GBR-001

Net Contents:

(TUBS) 6.6 lbs. (3 kg)

(READY TO USE ALUMINUM TRAYS) 1.1 lbs. (500 g) [10 Trays with 1.76 oz. (50 g) per tray]

(SACHETS) 11.02 lbs. (5kg) [200 Sachets x with 0.88 oz. (25g) per Sachet]

[0.88 oz. (25 g) Sachet [for individual sale]]

Manufactured For:

VITA (EUROPE) LIMITED
 c/o Landis International, Inc.
 P.O. Box 5126
 Valdosta, GA 31603-5126
 800-526-3471



AFIGUARD

For treatment of varroosis due to *Varroa destructor* in honey

Active Ingredient:

Thymol (CAS # 89-83-8)

Other Ingredients

Total:

**KEEP OUT OF REACH OF CHILDREN
DANGER**

FIRST AID	
If In Eyes	<ul style="list-style-type: none"> Hold eye open and rinse slowly and gently with water Remove contact lenses, if present, after the first 5 minutes Call a poison control center or doctor for further treatment and advice
If Swallowed	<ul style="list-style-type: none"> Call poison control center or doctor for treatment advice Do not induce vomiting unless told to do so by the poison control center or doctor Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person
If On Skin Or Clothing	<ul style="list-style-type: none"> Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes Call a poison control center or doctor for further treatment and advice
If Inhaled	<ul style="list-style-type: none"> Move person to fresh air. If person is not breathing, call 911 or an ambulance, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice

HOT LINE NUMBER
Have the product container or label with you when calling a poison control center. You may also contact CHEMTREC at 800-424-9300 for emergency medical information.

(See [leaflet inside the box/enclosed/side panels] for [entire label,] precise directions before use.)

EPA Reg No. 79671-1
Batch or Lot Number: _____

EPA Est

Net Contents:
(TUBS) 6.6 lbs. (3 kg)
(READY TO USE ALUMINUM TRAYS) 1.1 lbs. (500 g) [10 Trays with
(SACHETS) 11.02 lbs. (5kg) [200 Sachets x with 0.88 oz. (25g)
[0.88 oz. (25 g) Sachet [for individual sale]

Manufactured For:

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c/o Landis International, Inc.
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Valdosta, GA 31603-5126
800-526-3471



GENERAL INFORMATION

Failure to follow directions and precautions on this label may result in poor mite control, and/or illegal residues.

AFIGUARD is a product specifically designed for use in beehives. The unique slow release gel matrix formulation and easy-to-use [tray] [dosing syringe] ensures correct dosage of the active ingredient thymol. AFIGUARD gel regulates the liberation of thymol within the honeybee colony. AFIGUARD has no harmful effect on the honeybee colony, neither on brood nor on adults, when used according to directions.

For best results:

- Do not use the product when the maximum daily temperature is lower than 60°F or when the colony activity is very low.
- Do not use the product when the maximum daily temperature is above 105°F.
- Combine weak colonies before treatment.
- Make sure the worker bees can access the tray.

Restrictions:

- Do not treat during honey flow.
- Leave the product in the colony until the trays are empty. In any case remove the product when installing the supers on the colony.
- Remove surplus honey supers before applying treatment.
- Do not enter or allow personnel entry into treated areas during the restricted-entry interval (REI) of 48 hours.

APPLICATION PROCEDURES

The efficacy of AFIGUARD is maximized if the product is used in late summer after the honey harvest (when the amount of brood present is diminishing). However, in the case of severe infestations, AFIGUARD can also be used during springtime, when temperatures are above 60°F. Efficacy will vary between colonies due to the nature of the application. Therefore, AFIGUARD should be used as one treatment among others within an Integrated Pest Management program, and mite fall regularly monitored. If further significant mite fall is observed during the following winter or spring, use an additional secondary winter or spring treatment for varroa.

For 200 x 0.88 oz (25g) sachets: At temperatures above 77°F, a treatment using 2 x 0.88 oz (25g) or 3 x 0.88 oz (25g) Apiguard can be used effectively. A fourth dose of 0.88 oz (25g) gel can be applied at these temperatures, where mite infestations persist.

METHOD OF ADMINISTRATION:

FOR 6.6 lbs (3 kg) TUBS:

Open the hive. Place a piece of wax sheet, cardboard or plastic sheet (approximately 4" x 4"), or the provided dosing tray, centrally on top of the brood frames. **Stir [product] well before each use.** Remove the dosing syringe from its sealed packaging. Insert the syringe nozzle fully into the gel, ensuring no air is drawn into the syringe. Slowly pull the plunger back on the syringe to draw up 51ml (equivalent to 1.76 oz/50g) of Apiguard gel. Remove the syringe from the gel. Gently push the plunger downwards to release the gel within the syringe onto the dosing tray. Flatten out the gel with a hive tool, if necessary. Ensure that there is a free space of at least 1/4 inch between the top of the tray and the hive cover board, for example, by placing an empty super on top of the brood box. Close the hive. After two weeks apply the second dose of 51ml (equivalent to 1.76 oz/50g) Apiguard gel following the same procedure. Leave the product in the colony for a further 2 to 4 weeks until it totally disappears from the tray or until supers are installed, whichever is sooner. Total treatment period should be a minimum of 4 weeks and a maximum of 6 weeks.

At temperatures above 77°F, a lower dosage of 25-26 ml (approximately 0.88 oz/25g) Apiguard gel can be used effectively. At these higher temperatures, only one application of 25-26ml (approximately 0.88 oz/25g) should be applied at any one time. Repeat dose applications may be applied at intervals of 1-2 weeks, as needed for up to 4 applications of

APIGUARD

For treatment of varroosis due to *Varroa destructor* in honeybees

Active Ingredient:
 Thymol (CAS # 89-83-8)
 Other Ingredients
 Total:

**KEEP OUT OF REACH OF CHILDREN
 DANGER**

FIRST AID

If In Eyes	<ul style="list-style-type: none"> Hold eye open and rinse slowly and gently with water for 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for further treatment advice.
If Swallowed	<ul style="list-style-type: none"> Call poison control center or doctor for treatment advice. Do not induce vomiting unless told to do so by the poison control center or doctor. Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person.
If On Skin Or Clothing	<ul style="list-style-type: none"> Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
If Inhaled	<ul style="list-style-type: none"> Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor. You may also contact CHEMTREC at 800-424-9300 for emergency medical information.

(See [leaflet inside the box/enclosed/side panels] for [entire label,] precaution directions before use.)

EPA Reg No. 79671-1 EPA Establishm
 Batch or Lot Number: _____

Net Contents:
 (TUBS) 6.6 lbs. (3 kg)

(READY TO USE ALUMINUM TRAYS) 1.1 lbs. (500 g) [10 Trays with 1.76 oz (50g) Apiguard gel per application]
 (SACHETS) 11.02 lbs. (5kg) [200 Sachets x with 0.88 oz. (25g) per Sachet]
 [0.88 oz. (25 g) Sachet [for individual sale]

Manufactured For:
VITA (EUROPE) LIMITED
 c/o Landis International, Inc.
 P.O. Box 5126
 Valdosta, GA 31603-5126
 800-526-3471



25-26ml (approximately 0.88 oz/25g) where mite infestations persist. Remove any remaining Apiguard gel from the hive before successive applications. Use the dosing syringe as described above to administer the required dose of Apiguard gel.

Small and wintering bee colonies and nuclei require only one dose of 12-13 ml (approximately 0.44 oz/12.5g) to 25-26 ml (approximately 0.88 oz/25g) Apiguard gel (depending on the colony or nucleus size), left in place until the product disappears from the tray. Use the dosing syringe as described above to administer the required dose of Apiguard gel.

FOR 1.76 oz (50g) READY TO USE ALUMINUM TRAYS:

Open the hive. Peel back the foil lid of the APIGUARD tray leaving one corner of the lid attached to the tray. Place the open tray centrally on top of the brood frames, gel side up. Ensure that there is a free space of at least ¼ inch between the top of the tray and the hive cover board, for example, by placing an empty super on top of the brood box. Close the hive. After two weeks replace the first tray with a new one, according to the same instruction. Leave the product in the colony until the tray is empty. Remove the product when installing the supers on the colony.

At temperatures above 77°F, a lower dosage consisting of ½ of the contents of the tray (half tray = approximately 0.88 oz/25g) can be used effectively. At these higher temperatures, only one application of approximately 0.88 oz/25g (a half tray) should be applied at any one time. To use a half dosage of the tray, peel back the foil lid of the tray then using strong scissors cut the tray in half. Place half of the tray centrally on top of the brood frames, gel side up. Ensure that there is a free space of at least ¼ inch between the top of the tray and the hive cover board, for example, by placing an empty super on top of the brood box. Close the hive. Use the other half of the tray for treating another hive. Repeat dose applications may be applied at intervals of 1-2 weeks, as needed for up to 4 applications of approximately 0.88 oz/25g where mite infestations persist. Remove any remaining Apiguard gel from the hive before successive applications.

FOR 200x 0.88 oz (25g) SACHETS:

Open the hive. Place the dosing tray provided (approximately 4" x 4") centrally on top of the brood frames. Tear open the Apiguard sachet at the tear notch and squeeze out the sachet contents onto the dosing tray or surface. Ensure that there is a free space of at least ¼ inch between the top of the tray and the hive cover board, for example, by placing an empty super on top of the brood box. Close the hive. After one week replace with a second dose of 0.88 oz (25g) Apiguard gel. One week after the second dose apply a third dose of 0.88 oz (25g) Apiguard, following the same procedure. Where mite infestations are high, a fourth dose of 0.88 oz (25g) Apiguard can be introduced one to two weeks after the third dose. Leave the product in the colony for a further 2 to 4 weeks until it totally disappears from the tray or until supers are installed, whichever is sooner. Total treatment period should be a minimum of 4 weeks and a maximum of 6 weeks. Small and wintering bee colonies and nuclei require one dose of 0.88 oz (25g) gel only, left in place until the product disappears from the tray. At temperatures above 77°F, small or weak colonies can be treated with 0.44 oz (12.5g) Apiguard (half a sachet) only.

Overdose:

The use of a dose higher than [1.76 oz (50g) (for trays and sachets)/51ml (equivalent to 1.76 oz/50g) (for tubs)] of Apiguard gel per application, corresponding to 0.44 oz (12.5g) thymol, could cause disturbances in the behavior of the colony (agitation, absconding or increased mortality).

For 200 x 0.88 oz (25g) sachets: At temperatures above 77°F, the dose can be reduced to 1 x 0.88 oz (25g) (one sachet) per application.

In case of overdose, remove the excess product from the colony.

Withdrawal Period:

- Surplus honey supers can be installed immediately after the end of treatment and removal of the Apiguard product.
- Honey may be harvested immediately upon accumulation of sufficient surplus in the supers.
- Do not use during honey flow.

Apiguard



Natural Chemical (Essential Oil)

Active Ingredient: 25% Thymol

Mode of Action: **Fumigant**

- ❖ Place **gel packet** on top of frames (use a rim spacer)

- ❖ **Replace gel packet after 2 weeks**

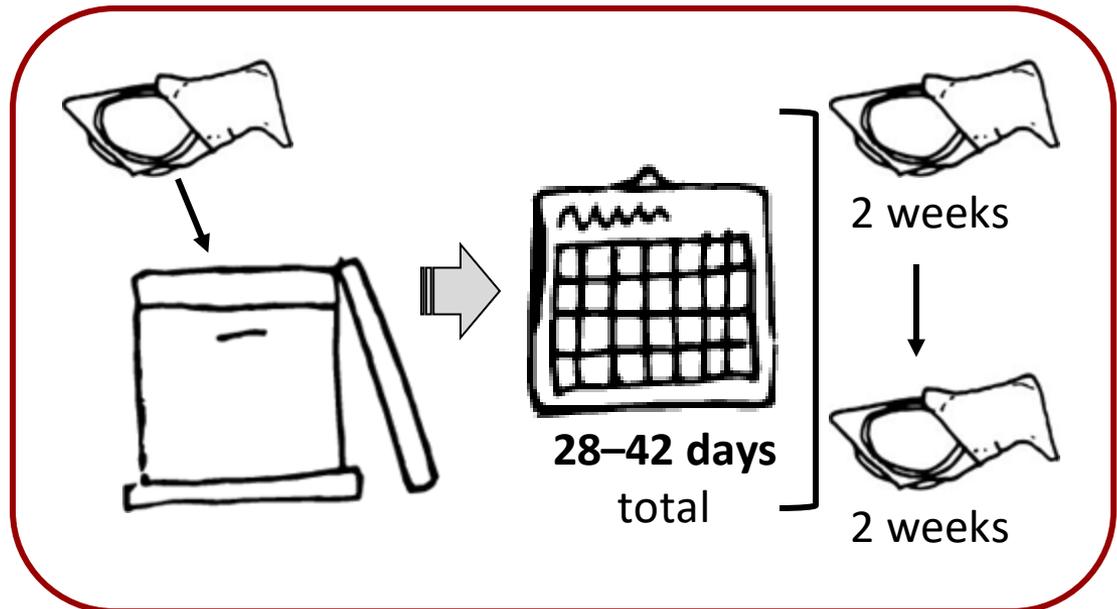
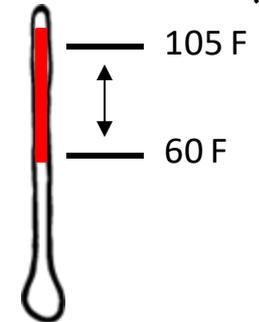
- ❖ If there's still gel after 2 weeks, can leave up to 2 weeks more



Wear
Gloves and
Goggles



Cannot apply
with supers



API LIFE VAR

NOTIFICATION

73291-1
 The applicant has certified that no changes, other than those reported to the Agency have been made to the labeling. The Agency acknowledges this notification by letter dated:

05/21/2019

For Use in Honeybee Colonies for the Suppression of Varroa Mites

Active Ingredients:	By Weight
Thymol	74.09%
Eucalyptus oil	16.00%
L-Menthol	3.73%
Other Ingredients	<u>6.18%</u>
Total	100.00%

Net Weight: _____

**KEEP OUT OF REACH OF CHILDREN
 WARNING**

EPA Reg. No. 73291-1
 EPA Est. No. _____

First Aid	
If inhaled:	<ul style="list-style-type: none"> • Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call poison control center or doctor for treatment advice.
If swallowed:	<ul style="list-style-type: none"> • Call poison control center or doctor immediately for treatment advice. • Have person sip a glass of water, if able to swallow. • Do not induce vomiting unless told to do so by a poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If on skin or clothing:	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call poison control center or doctor for treatment advice.
If in eyes:	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call poison control center or doctor for treatment advice.
Hot Line Number: Have the product container label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-233-7929 for information.	

(Note: The First Aid Statements' grid format will be used if market label space permits; otherwise a paragraph format will be used.)

Before using this product read the entire **Precautionary Statements, Conditions of Sale and Warranty, Directions for Use and Storage and Disposal** instructions. If the **Conditions of Sale and Warranty** are not acceptable, return the product unopened, within 30 days of purchase, to the place of purchase.

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
 (If you do not understand the label, find someone to explain it to you in detail.)

Notific

API LIFE VAR

NOTIFICATION

73291-1

The applicant has certified that no changes, other than those reported to the Agency have been made to the labeling. The Agency acknowledges this notification by letter dated:

05/21/2019

For Use in Honeybee Colonies for the Suppression

Active Ingredients:

Thymol

Eucalyptus oil

L-Menthol

Other Ingredients

Total

Net Weight: _____

KEEP OUT OF REACH OF CHILD WARNING

EPA Reg. No. 73291-1

EPA Est. No. _____

First Aid

If inhaled:	<ul style="list-style-type: none"> Move person to fresh air. If person is not breathing, give artificial respiration, preferably mouth-to-mouth Call poison control center or doctor for treatment ad
If swallowed:	<ul style="list-style-type: none"> Call poison control center or doctor immediately for Have person sip a glass of water, if able to swallow. Do not induce vomiting unless told to do so by a pois Do not give anything by mouth to an unconscious pe
If on skin or clothing:	<ul style="list-style-type: none"> Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 Call poison control center or doctor for treatment ad
If in eyes:	<ul style="list-style-type: none"> Hold eye open and rinse slowly and gently with water Remove contact lenses, if present, after the first 5 mi Call poison control center or doctor for treatment ad

Hot Line Number: Have the product container label with you when calling a going for treatment. You may also contact 1-800-233-7929 for information.

(Note: The First Aid Statements' grid format will be used if market label space permits; otherwise)

Before using this product read the entire **Precautionary Statements** **Directions for Use** and **Storage and Disposal** instructions. If the **Cond** acceptable, return the product unopened, within 30 days of purchas

Si usted no entiende la etiqueta, busque a alguien para que se l
(If you do not understand the label, find someone to exp

Colony Treatment (8 to 20 full– size Langstroth frames or equivalent)

Two treatments per year may be made. A treatment (3 tablets) consists of the following:

Take one pack and cut the pack in half lengthwise. Each half pack will contain two pieces that should equal one whole tablet. Each half will treat one colony. Break the two half tablets into two pieces and place the 4 pieces around the edge of the brood nest on top of the top bars. Avoid placing the tablets directly above the brood nest. After 7 to 10 days replace with a second fresh tablet broken into 4 pieces as above. Repeat procedure again with third tablet, 7-10 days later and leave last tablet for 12 days. After 12 days remove residuals from colony.

Restrictions:

Remove Api Life Var tablets from hive at least 1 month (30 days) prior to harvesting honey.

Do not use during honey flows.

Do not use when surplus honey supers are installed on the hives.

Do not harvest honey from brood chambers or colony feed supers.

Do not use Api Life Var at temperatures above 95°F degrees.

Notes:

- Use of Api Life Var is most effective when less sealed brood is present.
- At higher concentrations, Thymol residues may impart off-flavors to honey. To minimize residues, carefully follow all label directions and restrictions. The potential for off-flavors can be further reduced by increasing the PHI and/or by delaying the replacement of surplus honey supers after the treatment is completed.
- The use of Api Life Var at average daily temperatures below 54°F degrees may result in less control of Varroa mites.
- The use of Api Life Var at higher than recommended temperatures over (95°F) may increase the potential for brood or bee mortality. Closely adhering to the label directions will minimize adverse effects. The benefits of Varroa mite control will usually greatly exceed the effects of limited mortality. However, since not every possible combination of colony and environmental conditions have been replicated in experimental trials, beekeepers should follow all directions and monitor colonies for unusual conditions or signs of colony stress.
- For best results, the colony should be as compact as possible during treatment. Combine weak colonies before treatment.
- Apply Api Life Var during the coolest time of the day either in the early morning or evening.
- Close up screened bottom boards and make colonies as tight as possible by reducing entrances and any other openings that exist.

Storage and Disposal

Do Not Contaminate Water, Food or Feed by Storage or Disposal.

Pesticide Storage: Store in original containers in cool, dry, isolated, well-ventilated area away from heat, sparks, and open flame. Do not eat, drink, or smoke in areas of use or storage. Do not store in houses or other areas where vapors could accumulate. Api Life Var is not affected by freezing, so it may be stored in unheated areas.

Pesticide Disposal: Pesticide wastes are toxic. Improper disposal of excess pesticide is a violation of Federal Law. If pesticide cannot be used according to label instructions and must be disposed of, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the

Api Life Var



Pop. Increase



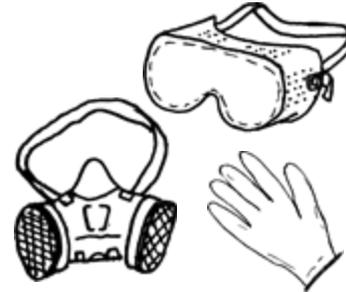
Pop. Decrease

Natural Chemical (Essential Oil)

Active Ingredients: 74% **Thymol**,
16% **Eucalyptus Oil** and 3.73%

Menthol

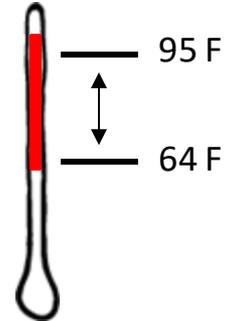
Mode of Action: **Fumigant**



Wear gloves, goggles
and respirator



Cannot apply
with supers

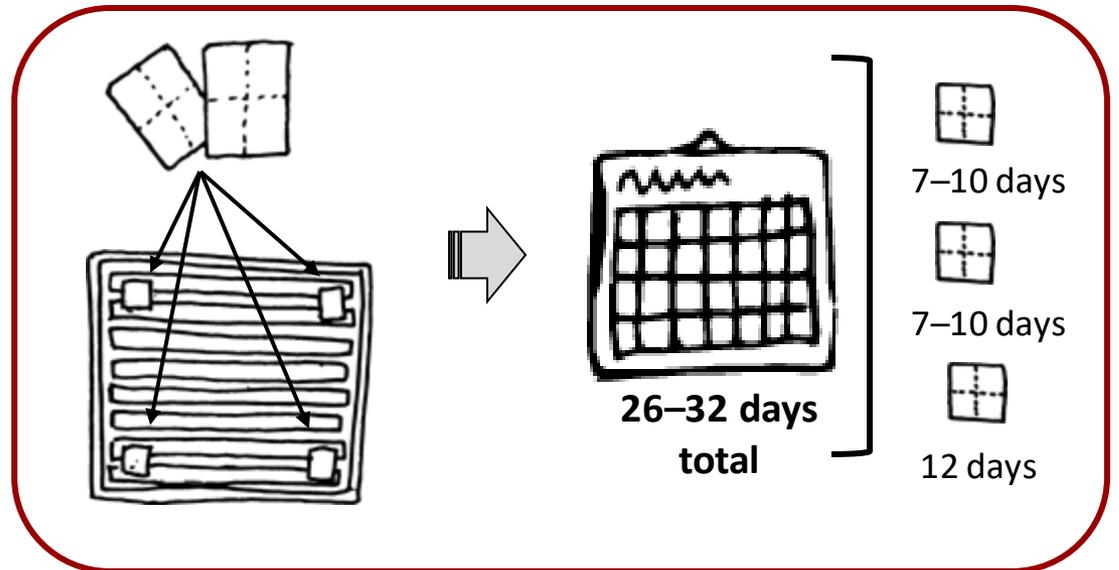


- ❖ Break pack in half lengthwise

- ❖ Divide half pack tablet into 4 pieces

- ❖ Place pieces on top of hive (in corners) for 7–10 days

- ❖ Repeat 3x





ACTIVE INGREDIENT	
Formic Acid (including formates)	46.7 %
Other Ingredients	53.3 %
Total	100.0%

NET CONTENTS
2 DOSES
(4 strips)



DANGER - POISON
CORROSIVE TO SKIN AND EYES
KEEP OUT OF REACH OF CHILDREN

PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

EPA REG. NO. 75710-2

EPA ESTABLISHMENT NO. 075710-CAN-001

Product Information Contact:

NOD Apiary Products USA Inc.
P.O. Box 117, 2325 Frankford Road, Frankford,
Ontario, Canada K0K2C0

www.nodglobal.com

(866) 483 2929

info@nodglobal.com

ACCEPTED

07/11/2019

Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 75710-2



PRODUCT OF CANADA

READ THE ENCLOSED PACKAGING LEAFLET FOR FULL APPLICATION, FIRST AID AND PRECAUTIONARY STATEMENTS

Mite Away Quick Strips® causes mortality to both male and female varroa under the brood cap as well as to the varroa on the adult bees.

Use Mite Away Quick Strips® as part of an integrated pest management (IPM) program. There are two treatment options when local thresholds are met:

OPTION ONE:
2 strips for 7 days.

OPTION TWO:
21-day treatment: 1st strip for 7 days and a 2nd strip applied 14 days later, for 21 days total.

USER SAFETY RECOMMENDATIONS

Users should remove Personal Protective Equipment/clothing immediately if pesticide gets inside. Wash thoroughly and put on clean clothing. Replace chemical gloves if punctured or stretched. Have water readily available should skin or eye contact occur.

Only use outdoors, stand upwind of product. Use caution when opening the container, especially in warm weather.

EXPIRY:

BATCH CODE:

PRECAUTIONARY STATEMENTS

FIRST AID TREATMENT

 IF INHALED	<ul style="list-style-type: none"> • Move person to fresh air. • If a person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
 IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison center or doctor for treatment advice.
 IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison center or doctor for treatment advice.
 IF SWALLOWED	<ul style="list-style-type: none"> • Call a poison control center or doctor for further treatment advice. • Have a person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything to an unconscious person.
<p>POISON CONTROL CENTER HOTLINE NUMBER 1.800.222.1222 Have the product container with you when calling a poison control center or doctor, or when going for treatment.</p>	
<p>NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.</p>	

HAZARDOUS TO HUMANS AND DOMESTIC ANIMALS DANGER - PELIGRO

Corrosive. Causes skin burns and irreversible eye damage. Harmful if swallowed. Harmful if absorbed through the skin. Do not get in eyes, on skin, or on clothing. Harmful if inhaled. Avoid breathing vapor. Applicators and other handlers must wear coveralls over a long-sleeved shirt, long pants, socks and shoes, acid resistant gloves (PVC, neoprene, or nitrile), and protective eye-wear. Remove and wash contaminated clothing before reuse. Wash skin thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

ENVIRONMENTAL HAZARDS

For terrestrial use: Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of used container, wash water or rinsate.

PHYSICAL OR CHEMICAL HAZARDS

Corrosive - Do not allow product to contact metal surfaces. Do not place, even briefly, on metallic hive covers. Store unused product in original container.

HANDLER PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear coveralls over a long-sleeved shirt, long pants, socks and shoes, acid resistant gloves (PVC, neoprene, or nitrile), and protective eyewear. Clean or replace PPE at end of each day's work period. Rinse off pesticides at rest breaks. Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

PESTICIDE STORAGE

Store indoors, in original container, out of direct sunlight, in a cool (under 77°F), dry and well-ventilated area away from sulphuric acid, oxidizing agents, and sources of ignition and away from the reach of children. Avoid heat, sparks, and open flames. Do not eat, drink or smoke in areas of use or storage. Use caution when opening the container, especially in warm weather (i.e.: open outdoors and stay upwind). Keep separate to prevent cross contamination of other pesticides, fertilizer, food, or feed.

FOR DISPOSAL OF UNUSED, UNWANTED OR DAMAGED PRODUCT

Contact Local Municipal Waste Disposal Authority or the National Pesticide Information Center at: 1.800.858.7378 (www.npic.orst.edu) or contact the Manufacturer.

CONTAINER HANDLING

Non-refillable container. Do not reuse or refill this container. Place in trash or offer for recycling if available. If partly filled: Call your local solid waste agency or (1.800.858.7378 / www.npic.orst.edu) for disposal instructions.

SACHET DISPOSAL

Rinse or air dry empty sachet, wearing PPE, and then dispose in a sanitary landfill or by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to these label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

Mite-Away Quick Strips (MAQS)



Pop. Increase



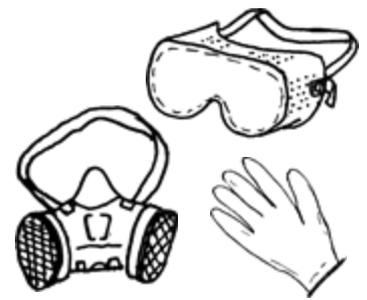
Pop. Peak



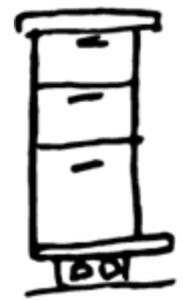
Pop. Decrease

Natural Chemical (Organic Acid)
Active Ingredients: 46.7% **Formic Acid**

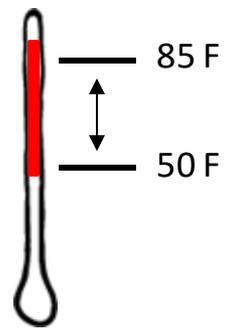
Mode of Action: **Fumigant**



Wear gloves, goggles and respirator



CAN apply with supers!



❖ 7 Days: 2 strips for 7 days
OR

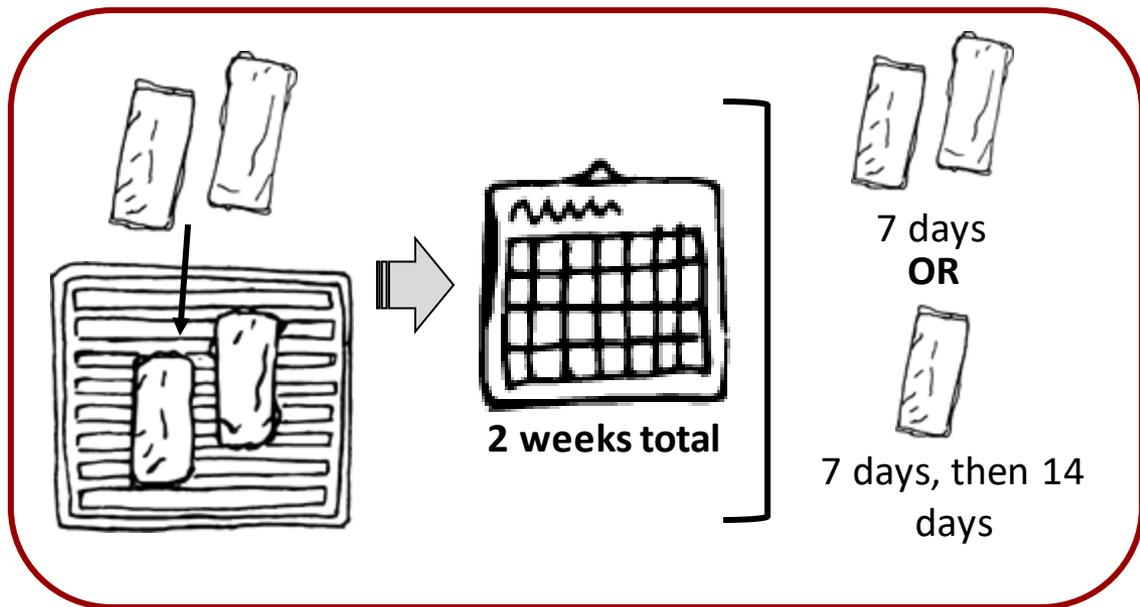
❖ 21 Days: 1 strip for 7 days, wait 14 days, then 1 strip

❖ Add empty super and remove entrance reducer for **ventilation**

❖ **The only miticide that kills under brood cappings!!!**

❖ Be careful of **high heat!**

❖ Can harm queens





FORMIC PRO

FOR TREATMENT OF VARROOSIS
CAUSED BY VARROA DESTRUCTOR IN HONEY BEES (APIS MELLIFERA)

ACTIVE INGREDIENT	
Formic Acid (including formates)	42.25 %
Other Ingredients	57.75 %
Total	100.0%

NET CONTENTS
2 DOSES
(4 strips)



DANGER - POISON
CORROSIVE TO
SKIN AND EYES

KEEP OUT OF REACH OF CHILDREN

PELIGRO

Si usted no entiende la etiqueta,
busque a alguien para que se la
explique a Usted en detalle. (If

you do not understand the label,
find some one to explain it to you
in detail.)

EPA REG. NO. 75710-3

EPA ESTABLISHMENT NO. 075710-CAN-001

Product Information Contact:
NOD Apilary Products USA Inc.
P.O. Box 117, 2325 Frankford Road, Frankford,
Ontario, Canada K0K2C0

www.nodglobal.com
(866) 483 2929
info@nodglobal.com

NOTIFICATION

75710-3

The applicant has certified that no
changes, other than those reported to
the Agency have been made to the
labeling. The Agency acknowledges
this notification by letter dated:



PRODUCT
OF CANADA

02/19/2020

READ THE ENCLOSED PACKAGING LEAFLET FOR FULL APPLICATION, FIRST AID AND PRECAUTIONARY STATEMENTS

FORMIC PRO™ causes mortality to both male
and female varroa under the brood cap as
well as to the varroa on the adult bees.

Use FORMIC PRO™ as part of an integrated
pest management (IPM) program. There are
two treatment options when local thresholds
are met:

OPTION ONE:
2 strips for 14 days.

OPTION TWO:
1st strip for 10 days remove and replace with
2nd strip for an additional 10 days.

USER SAFETY RECOMMENDATIONS

Users should remove Personal Protective
Equipment/clothing immediately if pesticide
gets inside. Wash thoroughly and put on
clean clothing. Replace chemical gloves if
punctured or stretched.
Have water readily available should skin or
eye contact occur.

Only use outdoors, stand upwind of product.
Use caution when opening the container,
especially in warm weather.

PRECAUTIONARY STATEMENTS

FIRST AID TREATMENT

 IF INHALED	<ul style="list-style-type: none"> • Move person to fresh air. • If a person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.
 IF ON SKIN OR CLOTHING	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison center or doctor for treatment advice.
 IF IN EYES	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison center or doctor for treatment advice.
 IF SWALLOWED	<ul style="list-style-type: none"> • Call a poison control center or doctor for further treatment advice. • Have a person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything to an unconscious person.

POISON CONTROL CENTER HOTLINE NUMBER 1.800.322.1222
Have the product container with you when calling a poison control center or doctor, or when going for treatment.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage.

HAZARDOUS TO HUMANS AND DOMESTIC ANIMALS DANGER - PELIGRO

Corrosive. Causes skin burns and irreversible eye damage. Harmful if swallowed. Harmful if absorbed through the skin. Do not get in eyes, on skin, or on clothing. Harmful if inhaled. Avoid breathing vapor. Applicators and other handlers must wear coveralls over a long-sleeved shirt, long pants, socks and shoes, acid resistant gloves (PVC, neoprene, or nitrile), and protective eye-wear. Remove and wash contaminated clothing before reuse. Wash skin thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

ENVIRONMENTAL HAZARDS

For terrestrial use: Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of used container, wash water or rinsate.

PHYSICAL OR CHEMICAL HAZARDS

Corrosive - Do not allow product to contact metal surfaces. Do not place, even briefly, on metallic hive covers. Store unused product in original container.

HANDLER PERSONAL PROTECTIVE EQUIPMENT (PPE)

Applicators and other handlers must wear coveralls over a long-sleeved shirt, long pants, socks and shoes, acid resistant gloves (PVC, neoprene, or nitrile), and protective eye-wear. Clean or replace PPE at end of each day's work period. Rinse off pesticides at rest breaks. Follow the manufacturer's instructions for cleaning/ maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

PESTICIDE STORAGE

Store indoors, in original container, out of direct sunlight, in a cool, dry and well-ventilated area away from sulphuric acid, oxidizing agents, and sources of ignition and away from the reach of children. Avoid heat, sparks, and open flames. Do not eat, drink or smoke in areas of use or storage. Use caution when opening the container, especially in warm weather (i.e.: open outdoors and stay upwind). Keep separate to prevent cross contamination of other pesticides, fertilizer, food, or feed.

FOR DISPOSAL OF UNUSED, UNWANTED OR DAMAGED PRODUCT

Contact Local Municipal Waste Disposal Authority or the National Pesticide Information Center at: 1.800.858.7378 (www.npic.orst.edu) or contact the Manufacturer.

CONTAINER HANDLING

Non-refillable container. Do not reuse or refill this container. Place in trash or offer for recycling if available. If partly filled: Call your local solid waste agency or (1.800.858.7378 / www.npic.orst.edu) for disposal instructions.

SACHET DISPOSAL

Rinse or air dry empty sachet, wearing PPE, and then dispose in a sanitary landfill or by incineration or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to these label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

EXPIRY: **BATCH CODE:**

Formic Pro



Pop.
Increase



Pop.
Peak



Pop.
Decrease

Natural Chemical (Organic Acid)

Active Ingredients: 42.25% **Formic Acid**

Mode of Action: **Fumigant**

- ❖ 14 Days: 2 Strips for 14 days
- OR
- ❖ 20 Days: 1 strip for 10 days, remove, 1 strip for 10 days

- ❖ Add empty super and remove entrance reducer for **ventilation**

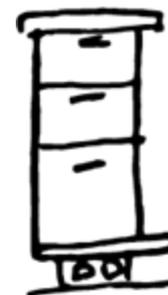
- ❖ **The only miticide that kills under brood cappings!!!**

- ❖ Be careful of **high heat!**

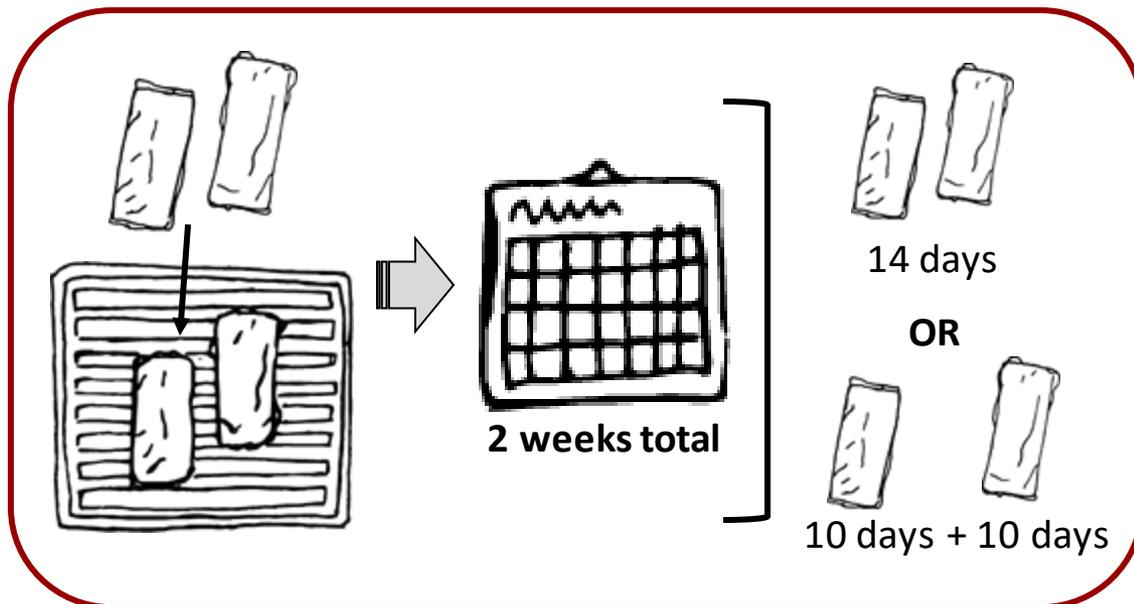
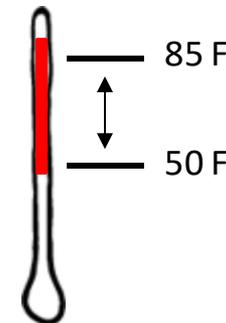
- ❖ Can harm queens



Wear gloves, goggles and respirator



CAN apply with supers!



**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND
DOMESTIC ANIMALS**

DANGER  **POISON**

Fatal if swallowed. Corrosive. Causes irreversible eye damage. Causes skin burns. May be fatal if absorbed through the skin. May be fatal if inhaled. Do not get on skin, in eyes, or on clothing. Do not breathe vapor or spray mist. Wear protective clothing, eyewear, and respiratory protection as listed under "Personal Protective Equipment."

PERSONAL PROTECTIVE EQUIPMENT:

Handlers and Applicators who apply product by the Solution Method must wear:

- Long-sleeved shirt and long pants
- Socks and shoes
- Chemical resistant gloves (barrier laminate, butyl rubber ≥ 14 mils., nitrile rubber ≥ 14 mils., neoprene rubber ≥ 14 mils., natural rubber ≥ 14 mils., polyethylene, polyvinyl chloride ≥ 14 mils, or viton ≥ 14 mils.)
- Protective eyewear such as goggles
- Half-face respirator with cartridge and/or particulate filter

Handlers and Applicators who apply product by the Vaporizer Method must wear:

- Long-sleeved shirt and long pants
- Socks and shoes
- Chemical resistant gloves (barrier laminate, butyl rubber ≥ 14 mils., nitrile rubber ≥ 14 mils., neoprene rubber ≥ 14 mils., natural rubber ≥ 14 mils., polyethylene, polyvinyl chloride ≥ 14 mils, or viton ≥ 14 mils.)
- Protective eyewear (goggles or face shield)
- Half-face respirator with cartridge and/or particulate filter

User Safety Requirements:

Follow manufacturer's instructions for cleaning/ maintaining PPE. If no such instructions are provided for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.

Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Remove PPE immediately after handling this product. As soon as possible, wash thoroughly and change into clean clothing.

Oxalic Acid Dihydrate

For Varroa mite control on bees

Active Ingredient:
Oxalic Acid Dihydrate:..... 97.0%
Inert Ingredients: 3.0%
TOTAL:..... 100.0%

KEEP OUT OF REACH OF CHILDREN

DANGER-PELIGRO **POISON**



ACCEPTED
Oct 13, 2015
<small>Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 91266-1</small>

FIRST AID

If swallowed	-Call a poison control center or doctor immediately for treatment advice. -Have person sip a glass of water if able to swallow. - DO NOT INDUCE VOMITING unless told to by the poison control center or doctor. -Do not give anything to an unconscious person.
If in eyes	-Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. -Call a poison control center or doctor for advice.
If on skin or clothing	-Take off contaminated clothing. -Rinse skin immediately with plenty of water for 15-20 minutes. - Call a poison control center or doctor for advice.
If inhaled	-Move person to fresh air. -If person is not breathing, call 911 or an ambulance, then give artificial respiration, if possible. DO NOT use mouth-to-mouth method if victim ingested or inhaled the substance, use respiratory medical device. -Call a poison control center or doctor for advice.

Have the product container or label with you when calling a poison control center, doctor, or going for treatment.

For non-emergency information concerning this product, call the National Pesticides Information Center (NPIC) at 1-800-858-7378 seven days a week, 6:30 am to 4:30 pm Pacific Time (NPIC Website: www.npic.orst.edu).

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Provide general supportive measures and treat symptomatically. Treatment should be rapidly instituted by giving a dilute solution of calcium lactate, limewater, finely pulverized chalk, plaster, and/or milk to supply large amounts of calcium to inactivate oxalate by forming an insoluble calcium salt in the stomach. Gastric lavage is controversial, since this may compound an already severe corrosive lesion in the esophagus or stomach. However, if used, gastric lavage should be done with limewater (calcium hydroxide). Intravenous gluconate or calcium chloride solutions should be given to prevent hypocalcemic tetany; in severe cases parathyroid extract also has been given. Additionally, acute renal failure should be anticipated, and careful fluid management is necessary. Metabolically its toxicity is believed to be due to the capacity of oxalic acid to immobilize calcium and thus upset the calcium-potassium ratio in critical tissues. Effective therapy against burns from oxalic acid involves replacement of calcium.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ THIS LABEL: Read the entire label. This product must be used strictly in accordance with this label's precautionary statements and use directions, as well as with all applicable State and Federal laws and regulations.

USE RESTRICTIONS:

Oxalic Acid Dihydrate applications are for outdoor use only.

DO NOT use in enclosed overwintering areas.

Use only in late fall or early spring when little or no brood is present. Oxalic Acid Dihydrate might damage bee brood. Oxalic Acid Dihydrate will not control Varroa mites in capped brood.

Do not use when honey supers are in place to prevent contamination of marketable honey.

Apply only when monitoring indicates treatment is required. Consult state guidelines and local extension experts for monitoring protocols and thresholds for treatment.

(See next page for additional DIRECTIONS FOR USE)

**UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE, Bee Research Laboratory
10300 Baltimore Avenue, Bldg. 306, Rm. 315
BARC-EAST
Beltsville, MD 20705**

**EPA Reg. No. 91266-1
EPA Est. No. 73291-NC-001
Net Contents: _____
Batch Code No.: _____**

Oxalic Acid



Pop. Decrease



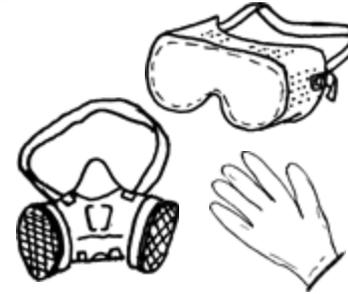
Dormant

Natural Chemical (Organic Acid)

Active Ingredients:

97% **Oxalic Acid Dihydrate**

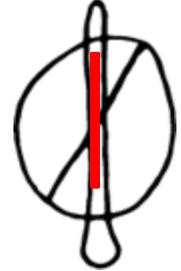
Mode of Action: **Fumigant, Contact**



Wear gloves, goggles and respirator



Cannot apply with supers



Not Temp. Dependent

1 Dribble

Weigh 35g Oxalic Acid



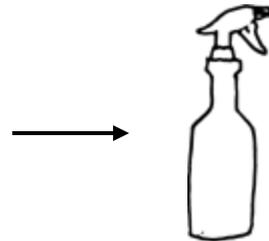
Add to 1:1 sugar syrup (warm, 1 liter)



Dribble over frames; 5ml/seam



2 Spray



For Packages:
Spray 3ml/1kg bees
(31.5ml/3lb package)

3 Vaporize



1g/brood box

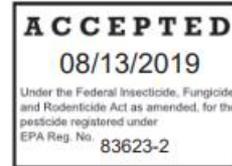


1. Insert into hive
2. Seal entrance with cloth
3. Connect to battery
4. Leave 2.5 mins
5. Disconnect battery and leave 2 mins longer
6. Remove vaporizer and keep hive closed for 10 min

HOPGUARD® III

For use in beehives to control Varroa mites (*Varroa destructor*) on honey bees

ACTIVE INGREDIENTS:	BY WEIGHT
Potassium Salt of Hop Beta Acids.....	16.0%
INERT INGREDIENTS:	84.0%
TOTAL	100.0%



KEEP OUT OF REACH OF CHILDREN

DANGER

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Danger: Corrosive. Causes irreversible eye damage. Do not get in eyes or on clothing. Wear appropriate eyewear such as goggles, face shield, or safety glasses. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

FIRST AID

- IF IN EYES:** Hold eyelids open and flush with a steady, gentle stream of water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for advice
- IF ON SKIN OR CLOTHING:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.
- IF SWALLOWED:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by poison control center or doctor. Do not give anything by mouth to an unconscious person.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-800-858-7378 for emergency medical treatment

For general information on product use, etc., call the National Pesticides Information Center at 800-858-7378. For emergencies, call the poison control center 1-800-222-1222.
Note to Physician: (*Probable mucosal damage may contraindicate the use of gastric lavage*. See label back panel for additional precautionary statements.

HopGuard III



Pop. Increase



Pop. Decrease



Natural Chemical (Organic Acid)

Active Ingredients: 16% **Hop Beta Acids**

Mode of Action: **Contact**

❖ **Hives: 2 strips for 14 days**

OR

❖ **Package bees: 2 strips for 3lb package**

❖ Not as effective when hive has brood

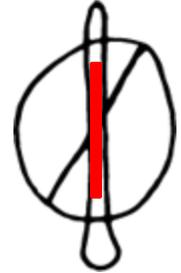
❖ **Can be used with honey supers on**



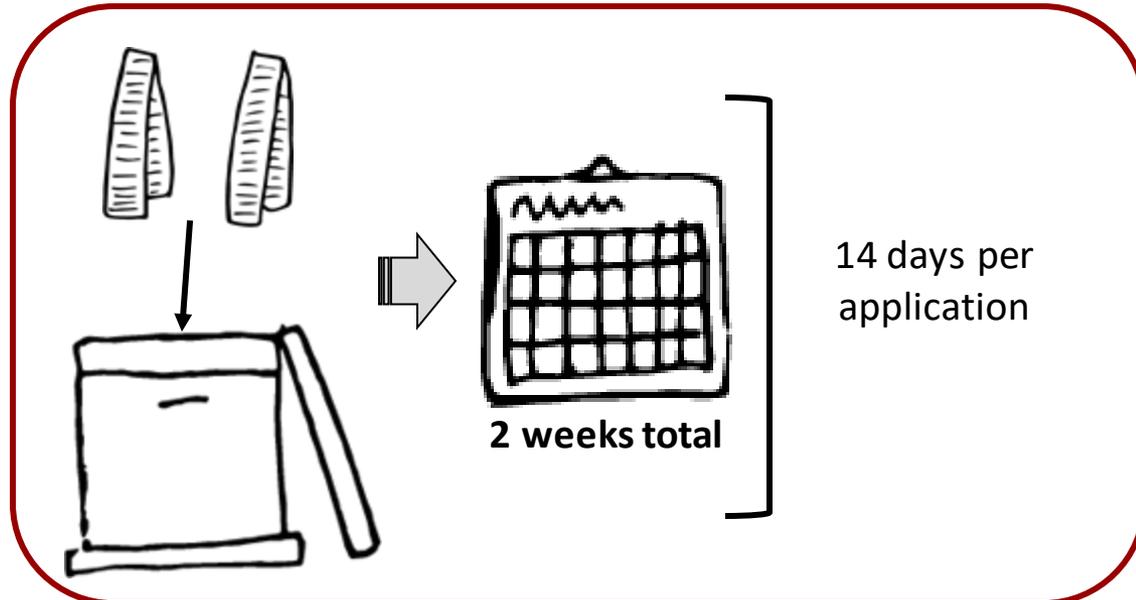
Wear gloves, goggles



CAN apply with supers!



Not Temp. Dependent



Chemical Tools – TEMPERATURE

<50°F



Oxalic Acid/Api Bioxal



HopGuard III



Apivar

≥50°F



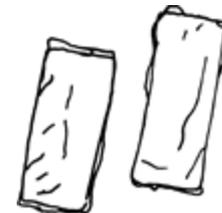
Apiguard



Oxalic Acid/
Api Bioxal



Apivar



MAQ/Formic Pro



Api Life Var



HopGuard III

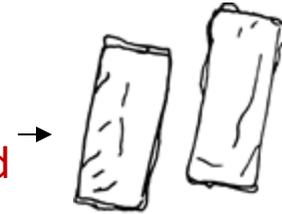
Chemical Tools – HONEY SUPERS

Can apply with supers



HopGuard III

Kills
under
capped
brood



MAQ/Formic Pro

Cannot apply with supers



Apivar



Apiguard



Api Life Var



Oxalic Acid/
Api Bioxal



QUESTION 9: WHAT ABOUT *OTHER* TREATMENTS?



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



**Rhubarb Leaves, Thyme Plants,
Mineral Oil, Powdered Sugar, Wood
Bleach...OH MY!**

*Off-Label Use of Pesticides is Non-
Effective and Against the Law!*



QUESTION 10: WHAT SHOULD I USE IN A NON-LANGSTROTH HIVE?



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



8-Frame Langstroth Hive



Top Bar Hive



Package Bees



Application timing: Treatment should be based on levels of Varroa mites observed in the colony. Spring: treat colonies, nucs and newly installed packages to reduce mite levels and boost colony growth. Fall: treat colonies to eliminate phoretic mites at a time when the colony is most vulnerable. HopGuard® III effectively reduces phoretic mite levels; if the infestation reaches threshold levels apply treatment 2 weeks apart (back to back) to increase efficacy. Efficacy also increases when low brood is present. Users must not take honey and wax from the brood chambers, only from the honey supers. Leave strips in the hive for 14 days and no later than 30 days. Use HopGuard® III up to 4 times per year.

Frames of Bees	1-5	6-10	11-15	16-20
# of Strips	1	2	3	4



HopGuard III



QUESTION 12: CAN I APPLY MULTIPLE TREATMENTS AT THE SAME TIME?



QUESTIONS



United States
Department of
Agriculture

National Institute
of Food and
Agriculture





FUTURE WEBINARS AND WORKSHOPS



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



Join Us for Future Webinars!



- **Monday, April 20th, 1:00–2:30pm:**
Varroa Mite IPM: Creating Your Own IPM Plan

Fight The Mite Workshop for Beekeepers

Saturday May 2nd, 9am–4pm – UMass-Amherst, MA



COST: \$40

<https://ag.umass.edu/pollinators/events/fight-mite>

Registration Includes:

- Bee-themed T-Shirt
- Sampling jar
- IPM brochure

Chance to win Apiary Diagnostic Kit!





EAS MAINE 2020

The Art & Science of Beekeeping
August 3rd–7th Orono,
Maine



Some Questions For You



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



Division of Crop and Pest Services
Apiary Program

Find a Colleague

- To post a profile about yourself and your work:
- <http://neipmc.org/go/APra>
- “Find a Colleague” site
- <http://neipmc.org/go/colleagues>

Recording of Varroa Mite IPM Webinar Series

- Past recordings and today's Webinar will be available to view **on demand** in a few business days.
- <http://www.neipmc.org/go/ipmtoolbox>
- You can watch as often as you like.

Acknowledgements

Northeastern IPM Center

This presentation was funded in part by the Northeastern IPM Center through Grant #2014-70006-22484 from the National Institute of Food and Agriculture, Crop Protection and Pest Management, Regional Coordination Program.



United States
Department of
Agriculture

National Institute
of Food and
Agriculture



Thanks for Joining Us!



Jennifer Lund

MDACF Apiary Program

207-287-7562

jennifer.lund@maine.gov



Kim Skyrn, Ph.D.

MDAR Apiary Program

617-626-1801

bees@mass.gov



Table 1: 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.

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.