Varroa Mites

The *Varroa* mite, *Varroa destructor*, is the most detrimental pest to honey bees. These parasites feed on honey bee adults and brood, weakening bees and transmitting viruses. If left unmonitored, an infestation of *Varroa* mites can kill the colony.

INTEGRATED PEST MANAGEMENT (IPM)

Integrated Pest Management (IPM) is an agricultural strategy for mitigating pests while minimizing the use of chemicals. Monitoring for pests is key to a successful IPM strategy. By monitoring, beekeepers can correctly time their applications and avoid large *Varroa* mite outbreaks.

There are four main principles all beekeepers should follow when using IPM:

1. Know your pest
2. Prevent pest build-up using non-chemical practices
3. Sample monthly to track pest population levels
4. Intervene with pesticides when populations reach damaging threshholds. Make sure to alternate products to prevent miticide resistance.

SIGNS OF VARROA MITES

When you conduct your hive inspection, look for signs that *Varroa* mites are present:

- Open or damaged pupal cells
- Chewed-down pupae
- Emerging adult bees with deformed or missing wings

When *Varroa* mites feed on honey bees, they open wounds on their bodies. *Varroa* feed primarily on honey bee fat body, an organ essential for energy storage, hormone regulation, immune response, and pesticide detoxification. In addition to weakening bees, *Varroa* mites transmit Deformed Wing Virus. When visual symptoms such as Deformed Wing Virus are present, *Varroa* mites often exceed the treatment threshold, so proactive monitoring for mites is necessary.

Honey bee with Deformed Wing Virus. (*klass de gelder, Flickr, CC BY-NC 2.0*)

A honey bee with *Varroa* mites on its body, walking up a frame in a heavily infested bee hive. (*Delaware Department of Agriculture*)

HOW TO CHECK FOR MITES

It is recommended that you sample your hive monthly to check the level of *Varroa* mites infestation. The "Alcohol Wash" is the most accurate way to check mite levels.

Materials Required

- Homemade or commercially prepared mite check kit
- ½ cup measure
- White dishpan
- Rubbing alcohol (70%) or soapy water (2 Tbsp Dawn dish soap per gallon of water)

8-Step Mite Check Process

1. Pour alcohol or soapy water into the jar. Set materials in easy reach.
2. Find a frame of open brood. Check that the queen is not on that frame!
3. Shake adult bees from the frame into a dishpan. Scoop ½ cup of bees (approximately 300 bees) and pour into the jar.
4. Shake the remaining bees from the bin into the colony.
5. Pour additional alcohol or soapy water in the container to cover an inch above the bees. Seal the container and shake for 1 minute.
6. Let the jar sit for 1-2 minutes.
7. Count the total number of mites. It's time to apply a chemical treatment if there are more than three (1% infestation).
8. Discard bees and mites. Wash all materials.

Visit **https://de.gov/honeybees** to watch how to do a mite check.

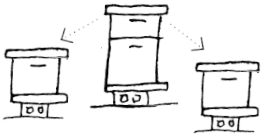
State Apiarist
Plant Industries Section
Ph: 302-698-4585
https://de.gov/honeybees

DELAWARE DEPARTMENT OF AGRICULTURE

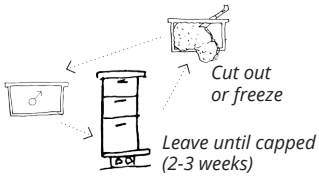
PREVENT PEST BUILD-UP USING NON-CHEMICAL PRACTICES

Spring and Summer

Re-Queen
Select mite resistant stock when available

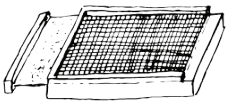


Brood Interruption
Split hive or allow to swarm (capture swarm!)



Drone Brood Trapping/Removal
Insert foundation-less or drone frame

All Year

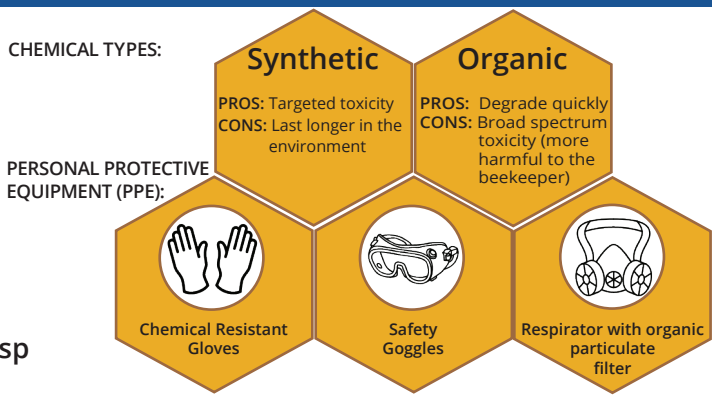


Screened Bottom Board

INTERVENE W/ PESTICIDES WHEN PESTS EXCEED THRESHOLDS (>3 MITES/SAMPLE)

In treating *Varroa* mites, two different chemical types are available: synthetic and organic. Rotating between treatments with different active ingredients is recommended to help to prevent *Varroa* mites from developing miticide resistance. Always read the product label before application to ensure you follow the requirements for your protect, the health of your bees, and the safety of your honey. For full product labels, visit:

http://kellysolutions.com/DE/searchbyproductname.asp



	Name *Active Ingredient* [mode of action]	Season *[Temp]* = less effective when brood present	Honey Super Safe?	Treatment Duration	Application Type For instructional videos: honeybeehealthcoalition.org/varroa	PPE Miticides can harm people too! Protect yourself w/ proper PPE!
Synthetic	**Apivar®** *amitraz* [contact]	Spring to Fall *[Not Temp Dependent]*	**NO X**	6-8 Weeks, Wait **2 weeks** to add honey supers	Plastic Strip	
Organic: essential oil	**ApiGuard®** *thymol* [fumigant]	Spring to Fall *[60 - 105°F]*	**NO X**	4-6 weeks, Can add honey supers **immediately after**	Gel or Gel Tray	
Organic: essential oil	**Api Life Var®** *thymol, menthol, eucalyptus oil* [fumigant]	Spring to Fall *[64 - 95°F]*	**NO X**	26-32 days, Wait **1 month** to add honey supers	Foam Wafer	
Organic: organic acid	**Formic Pro®** *formic acid* [fumigant]	Spring to Fall *[50 - 85°F]* **Kills mites in brood*	**YES**	2-3 weeks	Gel Strip	*Respirator Recommended (but not required)*
Organic: organic acid	**Oxalic Acid, Api-Bioxal®** *oxalic acid dihydrate* [contact, fumigant]	Spring to Fall and Winter Dormancy *[Not Temp Dependent]*	**YES**	Immediate (may need to repeat)	Powder, 3 options: *Spray (liquid)* *Dribble (liquid)* *Fumigation (vapor)*	
Organic: organic acid	**HopGuard II/III®** *potassium salt of hops beta acids* [contact]	Spring to Fall *[50 - 85°F]*	**YES**	1 month	Cardboard strip	

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