SAMPLE REGULARLY (EVERY MONTH!)

Alcohol wash

The most accurate way to determine *Varroa* levels in your hives

MATERIALS

Pint jar | **Original solid lid + Mesh lid*** | **1/2 cup measure** | **Dishpan** | **Rubbing alcohol (50-70%)**

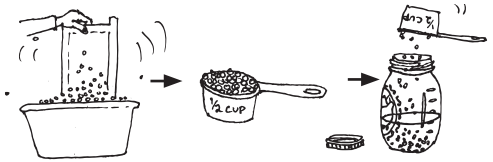
**1/8 inch hardware cloth, cut to match solid lid*

10 STEPS

1) Pour alcohol into jar. Set materials in easy reach

2) Find a frame of **open brood**
Check that the queen is not on frame!

3) **Shake adult bees from frame into dishpan**
Scoop ½ cup (~300) bees and pour into jar



4) Shake remaining bees from bin into colony

5) Seal solid lid on jar and **shake for 1-2 min**

6) Let jar sit for 1-2 minutes

7) Replace solid lid with mesh lid

8) **Shake jar contents into empty dishpan**

9) **Count the total # mites.**
If there are >3, it is time to apply a chemical treatment
(see inside of brochure)

10) Discard bees and mites
Wash all materials; can reuse alcohol

→ email bees@mass.gov for a free kit!

KNOW YOUR PEST

Meet the ***Varroa* mite**...

The Varroa Mite, *Varroa destructor*, is an external parasite that feeds on honey bee adults and brood. **They weaken bees and transmit viruses.**

Unmonitored and unmanaged infestations of Varroa mites will result in colony death.

COMMON SIGNS OF MITE DAMAGE:

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

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Drawings by Hannah Whitehead. Brood photo by Kim Skyrm. Other images from USDA Office of Communication in Research Science https://www.usda.gov/media/blog/2014/05/13/helping-honey-bees-health

Northeastern IPM Center | USDA United States Department of Agriculture | National Institute of Food and Agriculture

maine Department of Agriculture Conservation & Forestry | MDAR Massachusetts Department of Agricultural Resources | UMass Extension

Integrated Pest Management (IPM) for *Varroa* mites

IPM is a decades-old farm strategy for mitigating pests while minimizing chemical use. Experts now recommend IPM for *Varroa*.

Rather than relying on a "silver bullet", good IPM incorporates **multiple practices** throughout the season, based on **pest levels** and **pest biology**.

IPM PRINCIPLES:

→ **KNOW YOUR PEST**

→ **PREVENT** pest build up using non-chemical practices

→ **SAMPLE REGULARLY** to track pest population levels

→ **INTERVENE** with pesticides when populations reach damaging thresholds
(vary products to prevent pest resistance)

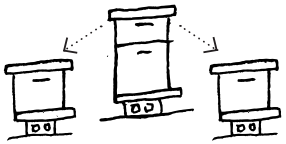
This pamphlet will help you to use IPM principles to manage Varroa *mites.*

PREVENT PEST BUILD UP USING NON-CHEMICAL PRACTICES

SPRING AND SUMMER

Re-Queen
Select mite resistant stock when available

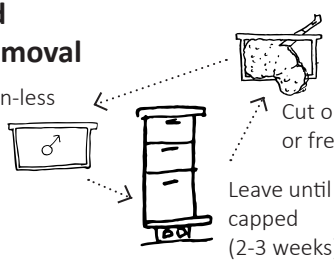
Brood Interruption
Split hive or allow to swarm (capture swarm!)



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

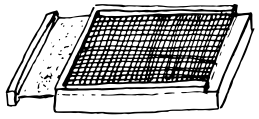
Cut out or freeze

Leave until capped (2-3 weeks)



ALL YEAR

Screened Bottom Board
Check mite drop for effectiveness



CHEMICAL TYPES:

Synthetic
PROS: Targeted toxicity
CONS: Last longer in the environment

Organic
PROS: Degrade quickly
CONS: Broad-spectrum toxicity (more harmful to the beekeeper!)

PERSONAL PROTECTIVE EQUIPMENT (PPE):

Chemical-resistant **gloves**	Safety **goggles**	**Respirator** with an organic particulate filter

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

TABLE OF MITICIDE OPTIONS *for full product labels, visit http://www.kellysolutions.com/MA/pesticideindex.htm*

	Name *Active Ingredient* [mode of action]	**Season** [temp] (= less effective when brood is present)	**Honey super safe?**	**Treatment Duration**	**Application Type** For instructional videos: honeybeehealthcoalition.org/varroa	**Personal Protective Equipment**
Synthetic	**Apivar®** *amitraz* [contact]	Pop. Increase; Pop. Decrease; [Not Temp Dependent]	NO	6-8 weeks; wait **2 weeks** to add honey supers	PLASTIC STRIP	*Miticides can harm people too!! Protect yourself with proper PPE*
Organic: essential oil	**ApiGuard®** *thymol* [fumigant]	Pop. Increase; Pop. Decrease; [60-105° F]	NO	4-6 weeks; Can add honey supers **immediately after**	GEL OR GEL TRAY	
Organic: essential oil	**Api Life Var®** *thymol, menthol, eucalyptus oil* [fumigant]	Pop. Increase; Pop. Decrease; [64-95° F]	NO	26-32 days; wait **1 month** to add honey supers	FOAM WAFER	
Organic: organic acid	**MAQS®, Formic Pro®** *formic acid* [fumigant]	***Kills mites in brood; Pop. Peak; Pop. Increase; Pop. Decrease; [50-85° F]	YES	*MAQS:* 1-3 weeks; *Formic Pro:* 2-3 weeks	GEL STRIP	*Recommended (but not required)*
Organic: organic acid	**Oxalic Acid, Api-Bioxal®** *oxalic acid dihydrate* [contact, fumigant]	Pop. Increase; Pop. Decrease; [Not Temp Dependent]; Dormant	YES	Immediate (but may need to repeat); wait **2 weeks** to add honey supers	POWDER, 3 options: *Spray (liquid)*, *Dribble (liquid)*, *Fumigation (vapor)*	
Organic: organic acid	**HopGuard II/III®** *potassium salt of hops beta acids* [contact]	Pop. Peak; Pop. Increase; Pop. Decrease; [50-85° F]	YES	1 month	CARDBOARD STRIP	