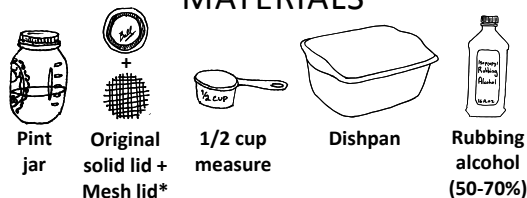


## SAMPLE REGULARLY (EVERY MONTH!)

### Alcohol wash

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

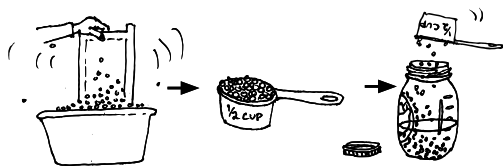
#### MATERIALS



\*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 1/2 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](mailto: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 Skyrms. Other images from USDA Office of Communication in Research Science <https://www.usda.gov/media/blog/2014/05/13/helping-honey-bees-health>



United States Department of Agriculture    National Institute of Food and Agriculture



## 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

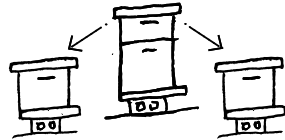
### Re-Queen

Select mite resistant stock when available



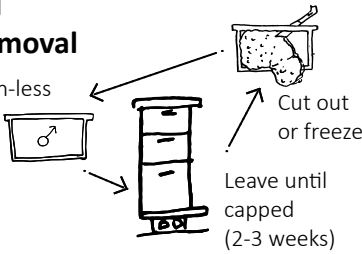
### Brood Interruption

Split hive or allow to swarm (capture swarm!)



### Drone Brood Trapping/Removal

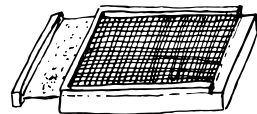
Insert foundation-less or drone frame



## 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: <a href="http://honeybeehealthcoalition.org/varroa">honeybeehealthcoalition.org/varroa</a>	Personal Protective Equipment
Synthetic	<b>Apivar®</b> amitraz [contact]	Pop. Increase → Pop. Decrease [Not Temp Dependent]	<b>NO</b> 	6-8 weeks  wait <b>2 weeks</b> to add honey supers	PLASTIC STRIP 	 <i>Miticides can harm people too!! Protect yourself with proper PPE</i>
	<b>ApiGuard®</b> thymol [fumigant]	Pop. Increase → Pop. Decrease [60-105° F]	<b>NO</b> 	4-6 weeks  Can add honey supers <b>immediately after</b>	GEL OR GEL TRAY 	
Organic: essential oil	<b>Api Life Var®</b> thymol, menthol, eucalyptus oil [fumigant]	Pop. Increase → Pop. Decrease [64-95° F]	<b>NO</b> 	26-32 days  wait <b>1 month</b> to add honey supers	FOAM WAFER 	
	<b>MAQS®, Formic Pro®</b> formic acid [fumigant]	***Kills mites in brood Pop. Increase → Pop. Peak → Pop. Decrease [50-85° F]	<b>YES</b> 	MAQS: 1-3 weeks Formic Pro: 2-3 weeks 	GEL STRIP 	 Recommended (but not required)
Organic: organic acid	<b>Oxalic Acid, Api-Bioxal®</b> oxalic acid dihydrate [contact, fumigant]	Pop. Increase → Pop. Decrease [Not Temp Dependent] Dormant	<b>NO</b> 	Immediate (but may need to repeat) wait <b>2 weeks</b> to add honey supers	POWDER, 3 options:  Spray (liquid) Dribble (liquid) Fumigation (vapor)	
	<b>HopGuard II/III®</b> potassium salt of hops beta acids [contact]	Pop. Increase → Pop. Peak → Pop. Decrease [50-85° F]	<b>YES</b> 	1 month 	CARDBOARD STRIP 	