



Varroa mites

a step-by-step guide to monitoring in New York



When should I monitor?

Varroa mites (*Varroa destructor*) are the most devastating threat to honey bees and are ubiquitous throughout New York. Monitoring your hives allows you to assess the severity of varroa infestations and treat your colonies when mite numbers exceed the economic threshold (Table 1). If left untreated, most hives will die within 1-2 years. Monitoring should take place once a month from May to September. It is **essential** to monitor again following treatment application to determine treatment efficacy. Sampling all colonies in a bee yard is ideal. If this isn't realistic because the apiary is large, randomly sample 10% of the colonies in each bee yard. Maintain written records of your monitoring to track mite populations.

Table 1. Economic threshold for varroa mites. Apply treatments when observing these mite counts.

Method	Number of Mites in May - July	Number of Mites in August - September
Powdered Sugar Roll	≥ 2 mites/100 bees	≥ 3 mites/100 bees
Alcohol Wash	≥ 2 mites/100 bees	≥ 3 mites/100 bees
Ether Roll	≥ 1 mite/100 bees	≥ 2 mites/100 bees
Sticky Board	≥ 9 mites/24hr	≥ 12 mites/24 hr

How should I monitor?

There are four monitoring methods that are good indicators of varroa mite levels: the powdered sugar roll, the alcohol wash, the ether roll, and the sticky board. The first three each require assessing 300 bees. In order to collect 300 bees for analysis, shake the bees off of a frame from the brood nest into a shallow plastic container, as this area contains the highest number of mites. **Use a measuring cup to collect ½ cup of lightly packed bees, which is equivalent to about 300 bees. Make sure you don't accidentally sample the queen.**

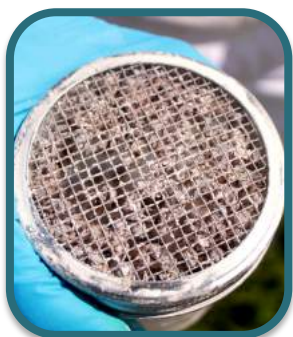


Gathering bees for monitoring. Many monitoring methods require measuring 300 bees. 300 bees roughly measures out to a ½ cup.

Counting varroa mites shaken into a bucket from either the powder sugar roll or the alcohol wash (19 shown here). Adult mites are reddish brown in color, oval in shape, have 8 legs, and are about 2 mm wide.



Choose the method that works for you



Powdered Sugar Roll

1. Collect 300 bees in a clear plastic or glass jar with a $\frac{1}{8}$ inch wire mesh screen lid
2. Add 2 Tbsp. of powdered sugar and gently swirl jar for 1 minute to coat bees
3. Turn jar upside down and shake vigorously for 2 minutes over a light colored pan to catch varroa mites
4. Pour water into the pan to make the mites more visible
5. Count the mites in the pan and record these results
6. Divide this number by 3 to get an average mite count per 100 bees



Alcohol Wash

1. Collect 300 bees in a clear plastic or glass jar
2. Add 70% (or higher) alcohol to the jar to completely submerge the bees and add lid. Ethanol, ethyl alcohol, or isopropyl alcohol work well
3. Shake contents vigorously for two minutes to dislodge mites
4. Remove lid and pour the mixture over a $\frac{1}{8}$ inch wire mesh screen into a light colored pan
5. Count the varroa mites in the pan and record these results
6. Divide this number by 3 to get an average mite count per 100 bees



Ether Roll

1. Collect 300 bees in a glass jar and take it 10 yds. away from the hive, as ether agitates bees
2. Spray three quick sprays of engine starter fluid onto bees and put on lid. Too much starter fluid makes it difficult for mites to remain stuck to the jar wall
3. Shake bees for one minute
4. Count the varroa bees stuck to the side of the jar, rotating the jar slowly to make sure to see them all. Draw a vertical line as a starting point to keep track of where you started
5. Divide this number by 3 to get an average mite count per 100 bees



Sticky Board

1. Draw a grid onto a piece of thick paper 14 x 18 in to ease mite counting
2. Thinly coat the paper with petroleum jelly so mites will stick. For more accurate results, purchase a sticky board through a bee equipment supplier
3. Insert the paper/sticky board under the brood chamber beneath a screen bottom board. If you don't have a bottom board, lay a piece of $\frac{1}{8}$ inch wire mesh over the paper
4. Collect the paper/sticky board after 3 days and divide mite counts by 3 to determine the average drop in 24 hrs.

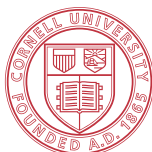
Table 2. Comparisons of the pros and cons of each varroa mite monitoring method.

Method	Pros	Cons
Powdered Sugar Roll	<ul style="list-style-type: none"> Mite levels are determined in a single visit Standard measure of 300 bees allows for colony comparisons 	<ul style="list-style-type: none"> Not as accurate as alcohol wash or ether roll because some mites remain on the bodies of bees Can be time consuming if you have many colonies
Alcohol Wash	<ul style="list-style-type: none"> Mite levels are determined in a single visit Standard measure of 300 bees allows for colony comparisons 	<ul style="list-style-type: none"> 300 bees die
Ether Roll	<ul style="list-style-type: none"> Mite levels are determined in a single visit Standard measure of 300 bees allows for colony comparisons 	<ul style="list-style-type: none"> 300 bees die If done too close to the hive, bees inside the hive can get agitated from the smell of ether Ether is highly flammable
Sticky Board	<ul style="list-style-type: none"> Can monitor mite drop during treatments No bee deaths from monitoring Can detect low levels of mites 	<ul style="list-style-type: none"> Need to return to the colony 3 days later Doesn't measure mite levels that are still on bees, only those that fall off Not easy to compare mite numbers across colonies due to variation in colony size and behavior (e.g., grooming, hygienic behavior) Can be difficult to visually discern mites from other hive waste. Ants and scavengers might remove mite bodies

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