

# Varroa Mite Control in Middle Tennessee

## From the Nashville Area Beekeepers Association

An Advanced Beekeeping Workshop was conducted by the Nashville Area Beekeepers Association in January 2017. **One of the goals of the workshop was to develop an integrated annual Varroa mite control program that would be recommended for our members in middle Tennessee.**

While the scientists who led the workshop and other leading national experts believe this is an appropriate, and currently the best approach for beekeepers in Middle Tennessee, NABA understands there are other approaches, and each beekeeper must determine what is best for his/her bees.

Here are 3 quotes by leaders in the area of mite control (including Jennifer Berry, who presented at the recent NABA workshop):

*“Today, if you don’t do chemical treatment for Varroa mites, expect to replace all your bee colonies about every 2 years”* Dr. Gary Reuter, Researcher, University of Minnesota Bee Lab.

*“If you feel that you cannot chemically treat your bee colonies for mites, then you should not be keeping honey bees”* Jennifer Berry, Researcher, University of Georgia.

*“It is critical that all beekeepers test for mites multiple times a year, especially in the early spring and fall. If mite levels are above the acceptable level, you must treat. If after treatment, mite levels are still too high, treat again.”* Dr. John Skinner, Director of Apiculture, University of Tennessee.

**Below is a program derived from the NABA Advanced Beekeeping Workshop and from presentations at the Tennessee Beekeepers Association Convention. Most experts agree that this approach is one of the most effective ways to control mites. It is believed to be both the simplest effective program and attempts to apply the best currently available science:**

- Today in this country, virtually all bee colonies have Varroa mites.
- Mites are the #1 reason for colony loss in this country today.

- Mites weaken the colony, making the bees susceptible to a wide range of other pests and diseases, which eventually kill the colony.
- Non-chemical, integrated pest management (IPM), “no treatment plans” and organic techniques provide only some minor benefit, but even in combination will not control loss of a colony due to mites.
- The level of mites cannot be detected visually. You must do a mite count test.
- You must regularly test your colonies for mites using one of the accepted methods---sugar roll, alcohol wash, sticky board, etc. Instructions for the sugar roll test are attached at the end of this document.
- If mite levels are above the acceptable threshold for the specific test, then the hive must be treated or colony loss will be inevitable.
- There are many products available and approved for mite control. Be absolutely certain to follow the instructions for use and safety exactly. Many of these products are temperature sensitive, restricted to when brood production is low or require that supers with honey intended for human consumption not be on the hive.
- Some methods will kill the mites attached to the bees only and not mites inside capped cells. A sizable portion of mites in a hive are inside the capped brood cells.
- The general belief among experts is that Oxalic Acid is the best available treatment. It has been used for many years in places like Europe with great success and was recently approved for use in the US.
- However, Oxalic Acid will not penetrate and kill mites inside capped cells. Thus, Oxalic Acid is most effective when used in combination with an “interruption of the brood cycle” or during a time of the year when the Queen is not laying eggs (winter).
- There are two methods for the use of Oxalic Acid---1) mixed with sugar syrup and dribbled over the brood nest and 2) the vaporizer wand.
- The vaporizer wand is recommended for “backyard beekeepers” and “sideliners”. It is somewhat more time consuming than the other method. For commercial beekeepers and people with a very large number of hives, the dribble method will be easier. This is an excellent video showing the use of the vaporizer wand:

<https://www.youtube.com/watch?v=cRVtn9COPoM>

- When using Oxalic Acid in the late summer and fall after honey production, Jennifer Berry recommends “the Queen be caged” for 14 days prior to treatment. This involves putting the Queen in a cage inside the hive so she cannot lay eggs during this period. The cage must be made of “Queen excluder material” so that attendants can get to the Queen during this time. If you are uncomfortable caging your Queen, you should still treat in late fall or winter. Caging the Queen is not necessary in the winter.
- About 2 weeks following treatment, test again for mite levels, using one of the standard tests (sugar roll test described below). If mite levels are still above acceptable limits for the test, retreat the hive.
- If you get an unacceptable level of mites in testing and the conditions are not right for an Oxalic Acid treatment, use an alternative treatment method. Start by considering a Formic Acid treatment, such as Mite-Away-Strips. Again, closely follow label instructions.
- **In general, expect to treat your hives with the Oxalic Acid vaporizer wand in the Winter when brood production is minimal and in the late Summer or Fall (along with pre-caging the Queen) after all honey supers are removed.**
- Jennifer Berry recommends that beginners with new hives treat twice during the first year, regardless of mite count test results.
- Think of your hives as one “super-organism”. If one hive has unacceptable levels of mites, then treat all the hives.
- We urge each NABA member to do his/her own review of this issue, and as you do, we would remind you of Jennifer Berry's caution as you research what is best for your bees: pay attention to the source of any information you find. A great deal of what you find on the internet, from articles, books and from other sources is unproven, of questionable value and not backed up with true science verification.

Net, there is a huge amount of “garbage information” out there on mite control. A great many of these recommendations have been proven not to be beneficial and in some cases actually harmful with regard to controlling mites. “Personal testimonials”, “anecdotal claims of what works” and “personal biases” are not scientific data.

- We have tried to boil this plan for controlling mites down to the absolute most simple and likely most effective process, requiring minimal decision making, low chances for confusion and low complexity. If you want to do research in depth and explore a huge array of available options, one of the best sources is the Honey Bee Health Coalition. See their manual for mite control at [http://honeybeehealthcoalition.org/wp-content/uploads/2017/01/HBHC-Guide\\_Varroa-Mgmt\\_5thEd\\_Jan-10-2017.pdf](http://honeybeehealthcoalition.org/wp-content/uploads/2017/01/HBHC-Guide_Varroa-Mgmt_5thEd_Jan-10-2017.pdf) The material and videos in this link are endorsed by Tammy Horn, Kentucky State Apiarist. A word of caution—there is a huge amount of complexity and sometimes conflicting options in this material.
- One of the easiest tests for sampling mite levels is described below:

## **Testing of Hives for Varroa Mite Levels**

### **Revised Sugar Shake Method**

From a Talk by Dr. John Skinner, Tennessee state Apiculturist

- Sampling should be done in the spring, fall and before & after treatment for mites.
- While not as sensitive as other methods, this is quick and easy. It is far better to sample more often with an easy method than less frequently by more involved methods.
- Collect about 300 bees in the sampling jar (about ½ cup). See level line on the jar in the kit. Older bees are preferred (rather than nurse bees). Put on screen cap.
- Add about 3-4 spoonful's of powder sugar through the screen on the top of the jar.
- Shake the jar with the bees and powdered sugar thoroughly. Let stand for about 5 minutes.
- Shake the sugar out of the jar onto a flat, light colored surface (a tray), evenly distributing the powdered sugar.
- Spray the surface of powdered sugar with a spray bottle with water to reveal the very small, reddish-brown mites.
- Carefully examine and count the mites in the tray.
- **In this test, the critical level is 1-2 mites per 100 bees.**
- **For the sample of 300 bees this is 3-6 mites.**
- **If there are 6 mites or more, the hive should be treated.**

- Return the bees coated in powdered sugar back to the hive.
  - If you want to check the number of bees you sampled, put the jar in the freezer and actually count the bees when they are dead.
  - **Test again for mite levels about 2 weeks after treatment. If there are 6 mites or more, the hive should be treated again.**
- Here is a photo of dead mites in the lime tray under a hive treated with Oxalic Acid vapor. This was an apparently “healthy hive” where the tested mite count was just below the threshold level where treatment was “required”. The photo shows only an area of about 1 ½” by 2 ½”. The entire bottom tray had hundreds of mites (dark spots)! Do you want these things sucking the life out of your bees?

