Varroa Mites in Piedmont North Carolina

by Buddy Marterre

A mated, female Varroa mite feeds on adult nurse bees in the brood nest for about a week – the phoretic phase. She then enters a cell one day before larval capping to begin the 13 – 16 day reproductive phase. For every female that enters a cell, 1 or 2 mated female mites emerge on worker brood, and 4 or 5 emerge on drone brood. Mites thrive in high humidity and prefer drone brood 12 to 1! Queen bees typically lay few or no eggs from November to January. Honey bee brood nest expansion takes place in February and March, and again in August/September. The Sourwood honey harvest is typically in late July and mite treatments cannot be rendered during honey flows. A large, strong healthy cluster in October is necessary for over-wintering success. Mite populations are typically low and stable throughout the spring and summer and double every 3 – 4 weeks from June to September. High mite populations in February/March often decrease without treatment. Thus, the ideal time to treat honey bees for Varroa mites is before the last brood cycles in the fall, to allow for a lot of emerging, healthy bees to over-winter the colony with as few mites as possible. Hives with high mite burdens during the fall brood nest expansion may not survive until the following March. Therefore August is the best time to treat for Varroa populations that exceed treatment thresholds. Treating all hives indiscriminately, under-treating, and over-treating only promotes the resistance of Varroa mites to the treatments we have.

- **Use resistant queens!** (VSH, Russian, 'survivor' colonies, and Minnesota Hygienic)
- **Use screened bottom boards year-round,** place your hives in the sun, off the ground, and **always ensure good hive ventilation** with ventilation blocks or screened inner covers.
- Consider drone brood trapping from April to August by using 1 frame of drone comb per brood chamber in position 3. Rotate the frames of capped drone brood from the hive to the freezer and back every 26 – 30 days (keep them frozen and only thaw them out for a few hours – **DON'T** feed decayed brood back to the bees!)
- **Do sticky board tests** and consider sugar shake tests **in July/August, and after treatments.**
- **Alternate** between Mite-Away II and ApiLife VAR **treatments** every other year **in August, <u>ONLY</u> if the treatment threshold is reached!**
- Strongly consider letting severely infested colonies die, rather than treating them.

Mite-Away II (formic acid). 75% mite mortality. Wear goggles, nitrile gloves and respirator and stand upwind! Remove outer pouch, place onto ½" spacer bars within a 1 ½" rim with the inner pouch holes down for 21 days. Daily outside HIGH temperature for treatment is 59 – 79 degrees F. Must be removed temporarily if high temperature > 82 degrees F and may not be in place when honey supers are present.

ApiLife VAR (76 % thymol, 16 % eucalyptol, menthol, camphor). 85% mite mortality.
Apply ¼ wafer on the 4 top edges of the broodnest 3 times: 7 – 9 days, 7 – 9 days, 12 days, then remove. Ideal AVERAGE daily outside temperature for treatment is 59 – 69 degrees F. Remember, thymol fumes go down. All remaining tablets must be removed 30 days prior to the addition of honey supers.

Bottom or Sticky Board Test
Estimate the number of adult bees in the hive by counting FULL frames of bees (both sides):
1,250 bees per full medium frame 2,000 bees per full deep frame
Then do the math (a completely full 10 frame deep-medium hive with no supers has over 30,000 bees)!
Cover the sticky board with cooking spray or Vaseline and place it under the screened bottom board. Remove it and count the mites 24 hours later. Treatment thresholds:

Mid-August	> 60 mites or	> 2 mites / 1,000 bees
September	> 100 mites or	> 4 mites / 1,000 bees

Sugar Shake Test
Construct the top of the Mason jar with 1/8" mesh screen. 4 oz of (shaken down) bees in a Quart jar is about 150 bees. 1 ½" of bees is about 8 oz or 300 bees. To perform the test: Gently gather 4 – 8 oz (150 – 300) nurse bees from an old larva area of broodnest in the Mason jar. Make sure you don't catch the queen! Add 1 – 2 tsp powdered sugar through the mesh lid. Roll the jar around for 4 minutes. Shake the sugar out through the 1/8" mesh lid onto a plate with water in it. The sugar will dissolve and the mites will swim / float on top of the water so you can count them. Release the bees at the hive entrance.
Treatment thresholds:

Mid-August	> 5 mites / 100 bees or	> 11 mites in an average (6 oz) sample
September	> 10 mites / 100 bees or	> 22 mites in an average (6 oz) sample