VARROA MITE MONITORING

USING A SUGAR ROLL TO IDENTIFY POPULATIONS OF *VARROA DESTRUCTOR* IN HONEY BEE COLONIES

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All photos in this document were taken by Andrew Potter (www.andrewpotterphoto.com)

Step 1. Get all your materials ready.

Pick a hive, and make sure you have the following equipment, or your mite-check kit. To purchase a mite check kit, visit www.pollinators.msu.edu/mite-check. Instructions to make your own sugar roll jar can be found at the Bee Informed website.

- ☐ Powdered sugar
- ☐ ½ cup measuring cup marked at 100ml or 0.42 cups
- ☐ Container with white bottom
- ☐ Sugar roll jar
- ☐ Water
- ☐ A buddy isn't necessary, but a second pair of hands often helps.

Step 2. Find a frame of brood. Open the colony, and move down through the colony until you reach the brood nest. Not quite there in this photo!

Take the lid off of your jar, and make sure that all your test equipment is clean and dry.

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Try to always select the same type of frame. This one has a lot of drone brood, so it may give us a different result. We try to choose a frame of brood with a mix of open larvae and capped brood.

This frame looks great. Check it carefully to make sure that the queen is not on it!

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Step 3. Get a 100ml (just under 1/2 cup) of bees. There are two ways to do this.

Method 1 - In the first method, you can knock the bees off the frame into your tub. Use one quick, hard shake (lots of little shakes will just annoy them – you want to go hard enough to startle them so they fall.

Shake the bees to a corner of the tub, and use your scoop to pick up your sample of bees and put in the jar.

Since you are using nurse bees, many can't fly quickly, and aren't as apt to sting.

You may have to thump / scoop more than once to make sure that you are getting the full sample of bees. You want to get as close to 100ml (0.42cups) as possible so that you can calculate an accurate count.

Method 2 - The second method of getting 300 bees involves slowly running the edge of the measuring cup along the frame, and letting the bees drop into the cup. This method is best used if the brood frame has some nectar on it. In the shaking method, the nectar can drip on the bees, making them sticky. In the method shown here, you want to be very careful that you are gently tripping the bees into the cup, and not rolling over their bodies.

Once you have ½ cup of bees in the jar, put on the screened lid.

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Step 4. Add powdered sugar. Add a heaping hive tool of powdered sugar through the screen (about 2 tbsp). Make sure that the powdered sugar coats all the bees.

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Step 5. Roll. Roll the jar for one minute, making sure that the bees are sufficiently coated with sugar. Make sure that you don't tip the jar upside down, and that all the mites stay in the jar until you can count them.

Step 6. Rest

Set the jar in the shade for 2 minutes. While the bees are in the jar, they heat up, causing the mites to fall off. The powdered sugar prevents them from being able to crawl back onto the bees.

Whiile you wait, you can put the colony back together.

Step 7. Shake. After 2 minutes are up, it is time to shake the mites into the tub. Shake the jar over for 1 minute, shaking hard enough that you dislodge any mites that are stuck to the sides of the jar or in between the bees. A common mistake is to not shake vigorously enough, so make sure you put some effort into it!

Once all the mites are in the tub, you can return the bees from the jar to the hive. They will be a bit worse for wear, but the other workers will quickly clean them up.

Step 8. Count mites. Add some water to the tub, dissolving the sugar so that you can see the mites.

Count and record the number of mites in the tub. A magnifying glass can be useful to see the mites, as they are quite small. Make sure that you are clear on what varroa mites look like. Here, the speck that is pointed out is a varroa mite. The similarly sized speck to the left, however, is not.

Calculate the number of mites per 100 bees. Your sample contains about 300 bees, so you have to divide the number of mites in your tub by 3 to get percent infestation. This colony had only two mites, so the mites / 100 bees = 2/3.

Step 9. Compare your mite count to your threshold.

As of spring 2016, many experts are using a threshold of 3% infestation (3 mites / 100 bees, or 9 mites in your ½ cup sample). This number may change over time, or by region. Make sure that you check with other beekeepers, extension, and tech transfer teams to learn current thresholds.

Continue to test the rest of the colonies in your yard. If you have only a few colonies, you will want to test all of them. If you have a lot of colonies, test at least 8 in each yard. Make sure that you are prepared with a plan if you find even one colony with high levels of mites. A high mite load in one colony can quickly spread to others.

Congratulations! You have just finished monitoring your honey bee colonies for the varroa mite, the first step in ensuring that your honey bee colonies are kept safe from this terrible pest. If your mite populations are below threshold, take good notes, and enjoy your day. If your mite populations are above threshold, make sure that you take action to protect your bees. For useful documents on what tools to use to manage the varroa mite, visit:

Sugar roll step-by-step

1. Gather all your materials
2. Find a frame of brood
3. Collect a ½ cup of worker bees from the brood into your jar
4. Add 2 tbsp powdered sugar to the bees in the jar
5. Roll the jar to coat the bees with sugar
6. Put the jar to rest in the shade for 2 minutes
7. Shake the mites out of the jar into a tub
8. Count the number of mites in your sample
9. Divide by 3 to get the number of mites / 100, and compare to your threshold
10. Feel good that you are helping keep your bees healthy!

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