

The Traveling Beekeeper



PREPARING FOR AN APIARY VISIT; VARROA MITE SAMPLING WITH POWDERED SUGAR

by Dr. LARRY CONNOR

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Recently I had just two minutes to gather my thoughts after being asked to give a talk about 'preparing for an apiary visit' at a training program. There are many days when I work bees, but I rarely think much about 'preparing' for the visit since I keep bees near the barn where just about everything I hope I will ever need is stored and can be located with a minimum of searching. This sense of security sometimes shatters when I am teaching or visiting in another location, and need to rely upon what I have in my vehicle, or what is on hand at the host beekeeper's site. Sometimes what I need is nowhere to be found. To prevent this we all need to have a few containers of items we need in the apiary, the contents will vary by the job at hand.

Minimum needs

Most of us MUST have a *minimum list*

supplies when we are in an out-apiary. My list is this:

1. Smoker, fuel and matches or lighter.

I have found more and more beekeepers who never use smokers. Yes, I agree that smokeless colony inspections encourage careful hive manipulation technique, but too often I have seen dangerous situations—to bee and beekeeper—when beekeepers don't use smoke. The most stings I have ever received have been those times when no smoker was lit! Most of the time I don't win the argument that I can get into and out of colony before the bees notice. Somehow they know someone was messing in their hive and that I was the person doing it. They reward me with venom therapy.

I argue that the proper use of smoke saves bees, as you can use smoke to move bees from the ends of frames as you work a hive,

and reduce the piles of bees in strong hives that develop when hive bodies and supers are taken off the hive and later reassembled when the inspection is complete. Rather than crushing hundreds of bees, a little smoke removes the pile of bees and minimizes their slaughter.

Smoke interferes with bee-to-bee communication and stimulates bees to engorge with honey and become less defensive, and thus less likely or able to sting. When I teach I insist on having a smoker lit that is large enough to produce smoke for 45-60 minutes minimum. My three favorite fuels are white or Southern pines needles, untreated bailing twine, and untreated burlap. A roll of wax paper provides a paper product that will light under most conditions (even when raining), followed by one of the three other materials. I avoid cardboard and other products that produce acrid smoke. I know that I have to



(l) Preparation for the apiary. Two buckets hold much of what we need for a bee yard visit. The metal bucket carries the smoker, hive tool, and several sized sticks and corks to stop the smoker. The plastic bucket holds a wide range of items: spare tools, marking pens for queens and hive tops, duct tape, bee brush, queen cages and more. (r) Cooking spray to check for varroa mites (natural drop or powdered sugar test), matches, hive tool (spare), bee brush and other items from inside the bucket.



(l) Sampling with powdered sugar for varroa mites. Find a frame of brood with good worker bee coverage. Shake the bees on the frame into one or two buckets. Take at least two samples from the hives you are testing. (r) Tap the bees into a corner and measure out 1/2 cup of bees, about 300 workers. Put these bees into a mason jar with 8 mesh hardware cloth. Add two tablespoons of powdered sugar and shake for 30 seconds. Let the bees sit for one minute.

breathe this smoke, so some dried herbs provide a nice finish to the smoke. There are folks using gas torches and small electronic devices to light their smokers. It's great to see these new ideas that simplify smoker lighting and guarantee smoke when you really need it.

2. Veil. I use a headpiece veil all of the time. I didn't always, but lately the bees seem to see my large, balding head and aim for the eyes. When I get stung around the eyes I do a pretty sad imitation of a puffer fish. So now it is easy on and easy off with the veil. A jacket and veil combo is great when the weather is cool. It also provides extra pockets for queen cages, if needed. (That reminds me that I need to soak my veil in a soap and non-Clorox bleach solution

over night to get rid of some staining and spotting. I do like white veils!) Why not keep a spare in case you have someone visit who offers to help lift supers!

3. Hive tool and maybe a spare for your helper.

Yard toolbox or kit

Make up a bucket or tool box to hold a more extensive list of items you may need in the apiary, and will have on hand 'just in case.' There are some 'bucket belts' sold at home improvement you may want to consider. There are some great tool belts that you could wear around your waist if it doesn't make your pants ride around you knees.

Here is a list of items that make sense:

1. Water-tight container of fuel and matches
2. Veil, maybe a spare.
3. Hive tools (2) and a small hammer for those well glued hive bodies
4. Empty queen cages, with candy or marshmallow, to confine an extra queen (swarm queen, or any 'extra' queen you find).
5. Marking pen for new queens (yellow in 2012).
6. Apiary notebook or clipboard.
7. Permanent marker to record data on hive lid or pencil for writing in your notebook (pen ink often fades when it gets wet, which it will).
8. Plastic bags for samples for examination at home, or to ship samples of suspected disease to the USDA Beltsville Bee Lab for analysis.
9. Bee brush or soft paintbrush to remove bees from comb or queen cells.
- 10 A hive body and super (if different sized) and frames and extra lids and drip board if I decide to take out a frame of honey.
11. A nucleus box for bees, brood and honey if making a nucleus I want to move to another location.
12. Smoker and metal bucket or box for transport. I use a metal pail to transport the smoker in the SUV, and use a wine cork to plug the smoke hole so I don't suffocate.
13. Duct tape. I use it for lots of things
14. Entrance reducer pieces (to adjust the entrance to the size you want or the bees need.
15. Hive staples (to move a nucleus or hive).
16. Stapler and staples to tag a hive for identification.

Sampling/Treatment bucket

If you are serious about keeping bees, you will have a special container for the materials you use to take samples of bees for varroa, nosema and other diseases. For example, if you use the Powdered Sugar



Shake the powdered sugar and mites onto a white card or paper plate. Keep shaking until no further mites fall out. Then take a water mister and liquify the powdered sugar so you can count the mites. Repeat this process for each colony so you obtain and average mite count. This sample has 14 mites on 300 bees, while another sample taken from the same frame of bees had just 4 mites. The average of six samples was 8.5 mites per sample, just below the recommended treatment level of ten mites per average sample for a hive.

Shake to count varroa mites, you will need the following items:

1. For each sample, a mason jar with #8 hardware cloth mesh cap.
2. Powdered sugar (kept in a plastic bag so it does not pick up moisture and become lumpy)
3. Dish tub or bucket to shake bees from a full frame of brood
4. One-half measuring cup to scoop out about 300 bees to put into the Mason jar
5. White paper plate or card to shake the sugar and mites into.
6. Spray bottle with water to dissolve the sugar.
7. Plastic bags if you want to wash the mite sample into a container for study under the microscope.

If you use the alcohol or windshield washer fluid wash sampling method, you will need to have the fluid to provide 2 ounces per sample, plus mason jars. If you use the ether roll sampling method, you will need a sprayer containing the starting fluid (ether).

If you are using a mite or nosema treatment, keep the material cool and dry until needed. Few miticides and antibiotics keep well in a hot vehicle.

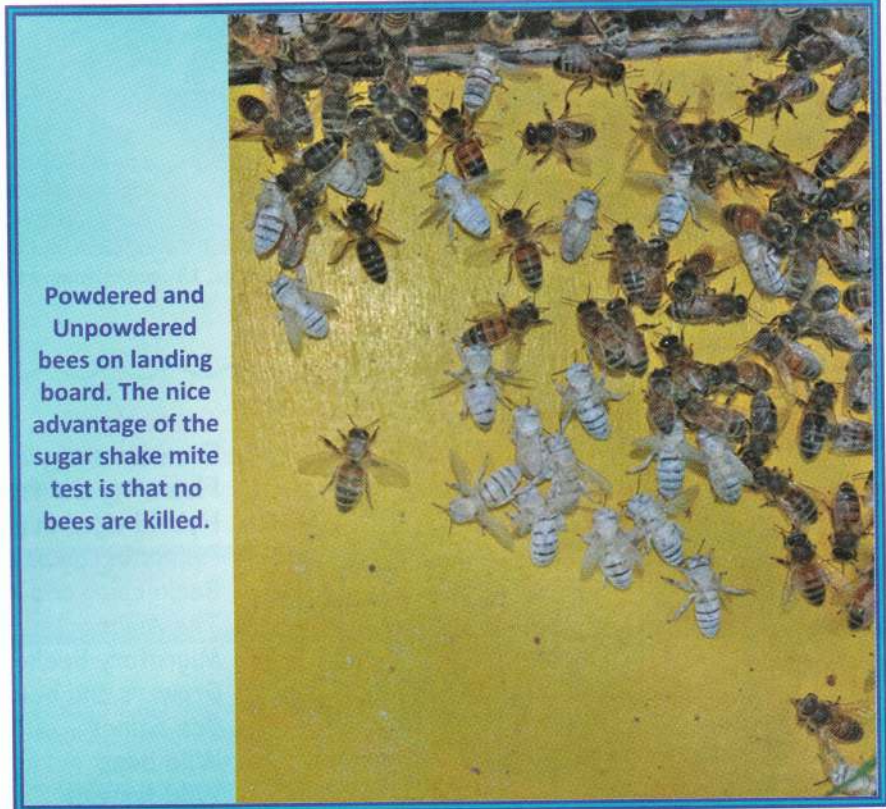
Varroa Mite Sampling with Powdered Sugar

In a new book by Drs. Diana Sammataro and Jay Yoder (*Honey Bee Colony Health*, CRC Press (2012), Dr. Ingemar Fries (Uppsala, Sweden) makes a valuable comment about assessing varroa mite levels in his article 'Evaluation of Varroa Mite Tolerance in Honey Bees.' He suggests that the 'daily rate of mite population growth during optimal mite breeding conditions be used to determine the breeding value for mite tolerance.' To do this a standard system of mite evaluation should be followed and compared over a period of time to determine the rate of mite development.

All beekeepers, even those with a few colonies, can simply and efficiently measure the rate of mite growth to determine the need for treatment (with the method of choice), and for selection of lines tolerant as shown by lower mite growth rates. The use of alcohol wash and ether roll sampling methods kills the bees during the process (300 bees out of a strong hive has been compared to a tissue sample during a biopsy). The use of powdered sugar to sample mite levels provides an alternative to killing the bees.

To sample a hive, the beekeeper should go to the brood frames where bees are found that have mites on their bodies. After finding the queen and setting her in a safe place, the brood frame is shaken into a box, bucket or other container. Using a 1/2 inch-measuring cup, scoop up a level number of bees (consistency counts when sampling). A half-cup is about 300 worker bees.

Pour these bees into a jar with a lid fitted with a mesh cap (#8 screening). Most of us will need to cut the mesh before we start this process!



Powdered and Unpowdered bees on landing board. The nice advantage of the sugar shake mite test is that no bees are killed.

Add two tablespoons of powdered sugar onto the bees (through the mesh) and shake for 30 seconds. Then, let the bees sit for one minute. There are differing opinions on what happens during this time as the sugar may force the mites to let go of the bees, or the bees get hot and the mites leave as a result. Regardless, the mites are on the bees instead of feeding on them.

Shake the container over a piece of white paper plate or cardboard until no more mites shake out of the jar.

Carefully spray the sugar and mite mixture on the paper plate with water so the sugar dissolves and the mites are easy to spot. Count the mites and trash both the mites and plate (the mites are still alive) or wash the mites into a plastic bag or container for study in the laboratory.

To be statistically solid, resample the same hive with multiple jars of bees. For example, I worked with a group of beekeepers where 6 samples were taken. We found only 4 mites in one sample and 14 in another, with an average of 8 mites overall. The statistical average is much stronger than any one single sample.

Return the alive but ghostly white worker bees to the hive where they will be cleaned up by their hive mates.

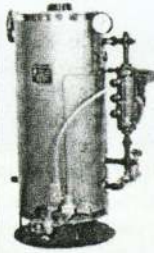
Following Fries suggestion, select only those colonies with low rates of mite growth for your breeding program. Only those colonies with high rates of mite reproduction will require treatment, hopefully using the safest material you are able to obtain.

Bee-sentials: A Field Guide by Dr. Connor may be ordered from your favorite bee supply dealer or directly from Wicwas

Press, 1620 Miller Road, Kalamazoo, MI 49001. The price is \$29.95 postpaid in the United States. If you live outside the US, please email LJConnor@aol.com for a quote payable via PayPal. Or check out the www.wicwas.com website for PayPal purchase. This full color book is ideal for use in bee classes and training programs, so contact Dr. Connor for quantity discounts to bee clubs.

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