



The Bee Informed Partnership
Using beekeepers' real-world experience to solve beekeepers' real-world problems.
Be Included. Be Involved. **Bee Informed.**

Sentinel Apiary Program: Honey Bee Sampling Protocol

(4- or 8-Colony Kit)

Overview

By monitoring disease levels over time, you, the beekeeper, will be able to make better decisions about when to treat colonies and whether treatments are effective. Participating beekeepers will be asked to collect samples from four or eight colonies once a month over the six-month sampling season. These samples will be sent to the University of Maryland Bee Lab and processed to determine *Varroa* loads each month and *Nosema* loads twice during the season.

Each sampling event involves opening the same four or eight colonies monthly from May to October, and choosing one frame that contains young, developing brood. Adult bees from this frame are then collected following the standardized protocol (see attached) and placed into sample bottles containing a saltwater solution. You will collect two ¼ cup scoops of bees (to total ½ cup of adult bees) from each colony. You will pour these two scoops of bees into the provided sample bottle and cap them tightly. As you spend time in each colony, you will take guided inspection notes within our app—which sends them directly to our database after you upload them—or on a paper copy (provided) that you will mail in with the samples.

You will then repeat this procedure for the remaining participating colonies. In summary, you should leave the apiary with four or eight sample bottles full of bees (one from each colony), and inspection notes either uploaded to the app or handwritten on a provided datasheet. As soon as possible after sampling—ideally within one to two days—you will send the samples to the University of Maryland Honey Bee Lab for analysis. Within two weeks of the samples' arrival to the lab (barring unforeseen circumstances) a report will be made available on your dashboard (research.beeinformed.org/) with your lab results and inspection notes.

Learn more about the program:

→ beeinformed.org/sentinel/

View historical Sentinel data online:

→ research.beeinformed.org/sentinel/

Please read this protocol carefully prior to initiating sampling. If you have any questions, please email the Sentinel Program team at sentinel@beeinformed.org or submit a help desk ticket here: beeinformed.org/sentinel-helpdesk/.



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Materials:

This kit contains six months' (six sampling periods) worth of sampling materials, listed in the chart below. Some item quantities vary based on kit size.

Materials Included (Figure 1):	Quantity:	Checklist:
Hive tags	6 or 10	<input type="checkbox"/>
¼ cup measuring scoop	1	<input type="checkbox"/>
Funnel	1	<input type="checkbox"/>
Shipping boxes (will arrive pre-built with bottles inside)	6	<input type="checkbox"/>
Mailing labels pre-addressed to the UMD Bee Lab	6	<input type="checkbox"/>
125 ml bottles pre-filled with saltwater solution	24 or 48	<input type="checkbox"/>
Quart Ziploc bags (will arrive pre-filled with bottles)	6	<input type="checkbox"/>
Envelope containing protocols and inspection guides	1	<input type="checkbox"/>
Datasheets and hive provenance sheets (will arrive in small boxes)	6	<input type="checkbox"/>

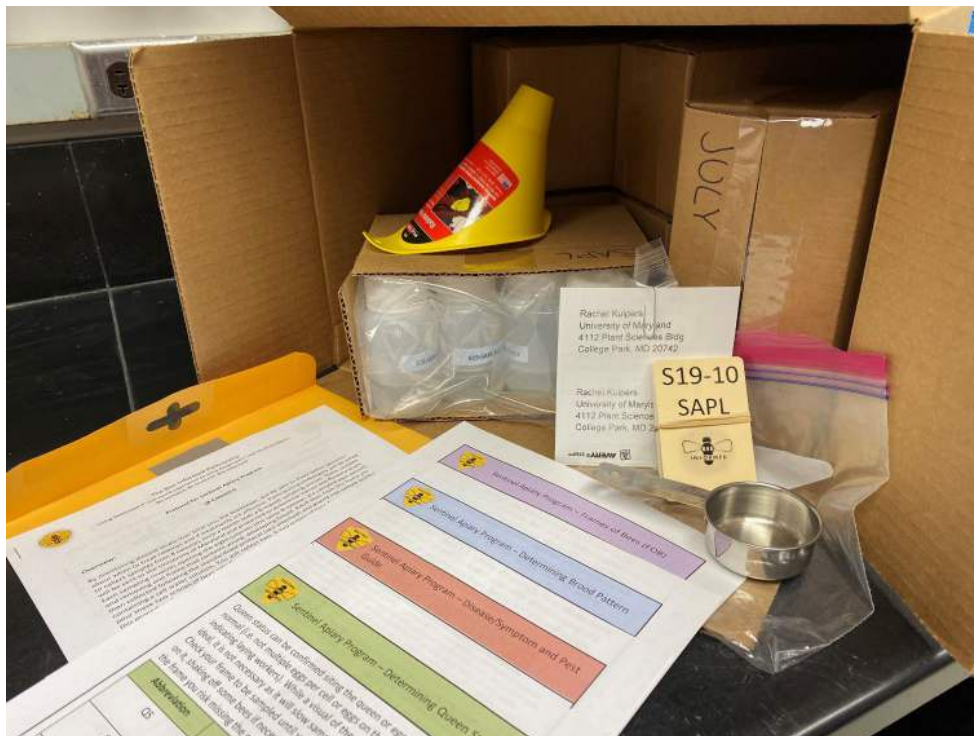


Figure 1: The contents included in a Sentinel kit. Some item counts vary based on kit size (8 colony kit shown).

You will also need (not provided):

- A staple gun (to affix the hive tag) or nails
- Postage to return the sample kits (estimated cost: \$10-12/month)
- Washtub (strongly recommended)



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Protocol

STEP 1: Select your participating colonies.

1. Select four or eight random colonies located in the same apiary. If possible, select colonies of differing strengths so we can obtain an accurate representation of disease levels in your apiary.
2. Affix a colony tag to each hive (Figure 2). It is vital to sample the same colonies throughout the season. Note that you have received six or 10 tags; save the spare two. These will be used if a colony dies and you need to tag another.

NOTE: If a colony dies during the sampling period, remove the hive tag and use one of the provided spare tags for a new colony in the same apiary. If you use the last sample tag, request more. Please do not reuse tags.



Figure 2: Colony ID tag (hive tag) attached to a box. Tag appearance may differ by year.

3. Fill out the required hive provenance information in the app or on the provided paper form. You only need to do this for Period 1 (May), unless a participating colony dies and a new one is chosen.



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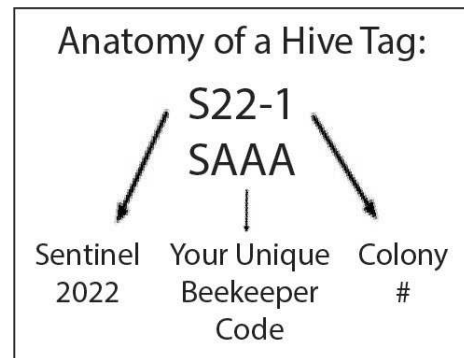
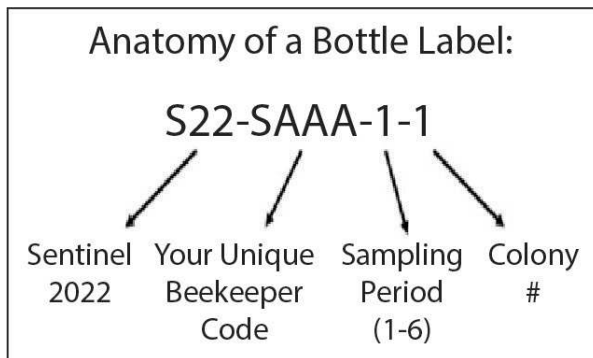
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STEP 2: Inspect and sample your participating colonies.

You will need to repeat the following steps every month, ideally around the 15th of the month \pm 1 week. Try to sample around the same time each month.

1. When you arrive in the apiary, place each sample bottle on the colony with its corresponding hive tag number (e.g., the bottle labeled S23-SAAA-1-1 will be placed by the colony tagged S23-1 SAAA; see below for a description of what your bottle labels and hive tags mean).



2. As you normally would, open the selected colony to the brood nest and examine for disease and queen status/condition. Grade queen status, frames of bees, and brood pattern using the provided inspection guides as references. Record these numbers and any other observations (e.g., disease, honey production, management, etc.) in the app or on the paper datasheet. Information submitted from each inspection will be available in your report for your records.
3. Remove the lid from the sample bottle with the matching colony number and place the funnel in the opening.



Figure 3: Sample bottle with funnel.



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4. Find a frame containing some uncapped brood.
5. Carefully examine the frame to ensure the queen is not on this frame. You don't want to collect her!
6. Firmly shake the frame over the washtub to dislodge the bees. Gently knock the corner of the tub on the ground so the bees collect in the corner. Gently scoop two $\frac{1}{4}$ cup scoops of adult bees ($\frac{1}{2}$ cup total = about 300 bees) from the tub and pour each scoop-full into the funnel (Figure 4) one at a time. Gently knock the bottle and funnel to get the bees to fall through the funnel and into the solution. 300 bees should fill about $\frac{2}{3}$ of the bottle (Figure 5). If you do not have a washtub, you can gently scoop bees directly from the frame by lightly dragging an open bottle upward across the frame so the bees fall in. Be careful not to harm wax cappings or sample the queen, and make sure the bottle is about $\frac{2}{3}$ full of bees.



Figure 4. Scooping bees from a tub into the funnel.



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Figure 5. A sample bottle $\frac{1}{3}$ full contains about 300 bees.

7. Close the bottle tightly, shaking it to make sure the bees are fully dampened with solution.
8. Repeat steps two through seven until all participating colonies have been sampled into individual bottles.

STEP 3: Mail the samples to the lab.

1. Double check that all the lids on the bottles are tightly in place and all bottles are labeled.
2. Place the sample bottles containing bees into the provided Ziploc bag to contain any leaks before placing them into the shipping box (Figure 7).

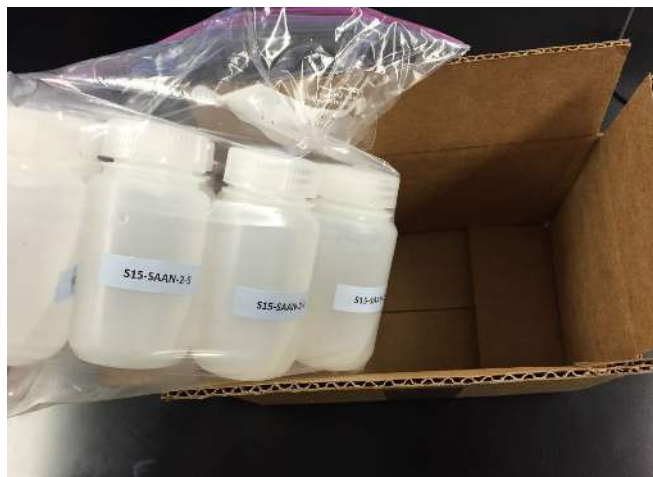


Figure 7: Packaging the sample bottles for return shipment to the UMD Honey Bee Lab.



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3. Ensure that your inspection notes are uploaded into the app or the paper datasheet is inside the box (but not inside the sample bag).
4. Place the mailing label on the box. Write FROM and your return address on the upper left corner of the box. If you lose the mailing labels, use this address:

Bee Informed Partnership
4291 Fieldhouse Drive
4112 Plant Sciences Building #036
College Park, MD 20742

Your report should be available within two weeks of when the UMD Bee Lab receives your samples (barring unforeseen circumstances). We will upload your lab results and inspection notes into the online dashboard as soon as possible, where you will be able to access your report. Thank you!