



The Bee Informed Partnership
Using beekeepers' real-world experience to solve beekeepers' real-world problems.
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Drone Sampling for Mites

2023 Sentinel - Lamas Collaboration

Overview

The BIP Sentinel Program is excited to collaborate with Dr. Zac Lamas and contribute to the data collection effort to validate his targeted monitoring technique.

BIP Sentinel Participants are encouraged to participate by collecting drones in May, June, and/or July following the protocol below. Though technically not part of the Sentinel Program, we hope you will help contribute to this important research effort!

If you agree to participate in this effort, you will sample your colonies as usual to send the *Varroa* samples to the lab. In addition, you can follow the protocol below to perform an alcohol wash on a sample of adult drones, and enter your results in the BIP app (see below).

If you enter drone wash results in the app, we will forward those results along with your other colony metrics (colony size, varroa wash results, etc.) to Dr. Lamas to include in his analyses. Location data shared with Dr. Lamas will be limited to county and state level information, and no beekeeper names, addresses, or contact information will be shared.

This protocol was adapted from the drone sampling protocol of Zac Lamas and James Wilson, located here: <https://zaclamas.com/wp-content/uploads/2023/04/MethodologyCitizenScience.pdf>

“Mites aggregate on adult drones.

Unfortunately, the [standard] alcohol wash was not designed to sample drones. This presents a predicament for beekeepers who want a reliable method to detect mites early in the season. Here we are asking beekeepers to help us validate a new sampling technique that may be better than the [standard] alcohol wash at detecting *Varroa* early in the season. With early detections beekeepers can be empowered to take control of mites before the mites devastate their colonies. Thank you for joining us this year. This document serves as a methods paper for your reference.”

-Dr. Zac Lamas





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Methodology: Performing the Targeted Alcohol Wash

Step 1. Remove the honey supers from the colony you will sample. Complete your Sentinel inspection and sampling as described in the Sentinel Honey Bee Sampling Protocol found in your Sentinel kits.

Step 2. We are now ready for the drone sampling. Retrieve a new brood frame, ideally one adjacent to the one you used for the Sentinel sample collection. Any brood frame from the center of the brood nest works, but avoid the outside brood frames (see Figure 1).



Figure 1: Sample adult drones from brood frames. Avoid the very outermost brood frames (indicated with a red x). Select frames from where the blue arrow is.

Step 2 (continued). Place the frame and bees horizontally on a surface that has a lip (e.g., a 5 gallon bucket lid), so the bees on the frame are not squished. Next, pick up about 20 drones from this frame and toss them into an open container of alcohol (e.g., a mason jar, a deli container, etc.). Repeat this step on a second frame for another 20 drones. Cover the container and set aside.



Figure 2. Picking up drones is easy; they do not sting. Quickly toss them into alcohol. Select drones randomly rather than with bias (i.e. likely seeking out newly emerged drones).



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Step 3. When you have sampled up to 40 drones and completed the inspection notes (queen status, colony strength, etc.) in the Sentinel app, you can put the colony back together. If you do not find 40 drones or end up finding more than 40 drones once they are counted, the information is still valuable — the number of drones will be recorded in the app (see Step 5 and Figure 3).

Step 4. Shake the drone sample for one minute or until no new mites appear.

Step 5. Count the number of drones and mites in each sample. Record the data in the “Notes” field of the “**New Sample**” section of the Sentinel app (see Figure 3 below).

The figure displays two side-by-side screenshots of the Sentinel app interface. The left screenshot, titled 'New Sample Event', shows a form with fields for 'Operation Owner' (Rachel Kuipers), 'Location' (PLSA), 'Collection Date' (May 12th 2023), 'Sentinel Kit Code' (SAAA), 'Sampler' (Rachel), 'Reason for Sampling' (May Sentinel sampling), and 'Event Notes' (Don't enter drone wash data here!). A green arrow points to the 'Add Management Action' button. The right screenshot, titled 'New Sample', shows a form with fields for 'QR (Queen Right)', 'Frames of Bees (in terms of deeps)', 'Brood Pattern', 'Temperament', 'Colony Weight', 'Sampling Method' (Alcohol Wash/Powdered Sugar), 'Mite Count', 'Estimated Bee Count', and 'Notes' (Drone wash: 5 mites on 38 drones). A green arrow points to the 'Notes' field, and a green circle highlights the text 'Drone wash: 5 mites on 38 drones'.

Figure 3. Be sure to use the colony-level “Notes” field (right) in the app rather than the apiary-level “Event Notes” field (left)!

Note from Zac: Thank you for participating in this study. Although this may look simple, the data you will collect will be instrumental in expanding 3 years of work already done on the subject. Feel free to contact us with any questions!