

National Bee Survey Transcript

The video you are about to watch is a demonstration of how to collect and submit samples for a national honeybee survey sponsored by the USD Department of Agriculture. Information from this survey will provide us a background of honeybee pests and disease in the United States. We'd like to thank you for helping us collect this important information. If you still have questions after viewing this video, we will provide written information as well as a contact person.

You have been asked to participate in the USDA National Bee Survey. You will collect a composite sample of adult bees from 8 colonies in each apiary that you sample.

You will need to open 8 colonies and remove a frame that contains young developing brood and shake the adult bees into the collection wash tub.

You will collect two ¼ cup scoops of bees – these bees will go into an alcohol bottle and in the live bee box for that apiary.

You will also “knock” a single brood frame from each colony to dislodge exotic parasitic mites like *Tropilaelaps*.

You will leave the apiary with a composite sample of live bees in the ventilated cardboard box and a composite sample of bees in alcohol in the large alcohol vial.

You will also have filtered wash from the comb “knock” in a smaller alcohol bottle.

Following are the specific steps involved in sample collection.

1. Before leaving for the apiary, ensure you have all of the necessary equipment, including beekeeping protective gear and beekeeping tools. It is also important to remember to fill the one gallon bottle and the wash bottle with water.

2. Identify an apiary with at least 8 colonies of bees. Also identify the nearest post office to this apiary. You will need to mail the live sample as soon as possible. It is important that live bee samples be mailed on the day of collection.
3. Before sampling an apiary, be sure to meet with the co-operating beekeeper, obtain their consent and give them the letter of explanation. This letter explains why we're collecting these samples, what we're doing with these samples and when they should receive results from the sample analysis.
4. Now you are ready to start sampling.

Open one live bee mailing box. It should contain:

A ziplock bag containing one large bottle and one small bottle of alcohol.

Another ziplock bag contains a data sheet, ID stickers, mailing labels, stamp, and a nylon filter.

You will find a petri dish glued to the bottom of the box that contains queen candy and a sponge.

5. Next, place one ID sticker onto the data identification sheet.

Another on the large collection bottle containing alcohol.

One on the small collection bottle containing alcohol.

And place the final ID sticker onto the live bee shipping box.

6. Fill out the data information sheet. This includes beekeeper's contact information, apiary location and date of data sample collection.
7. Now, set up the sampling equipment.

First, remove the Petri dish lid that is covering the queen candy glued to

floor of the box – there may be a piece of wax paper covering the candy which should also be removed.

Next, soak the sponge in water and place it in the second half of the Petri dish. The water and queen candy will provide nourishment as the bees are being shipped from the apiary to the lab.

Now close the shipping box. This can be a little tricky, so be sure to compress the sides of the bottom of the box to enable the top to slide completely down. Be sure the top is flush with the bottom of the box so no bees are able to escape.

Now, place the funnel into the hole on the top of the box.

Finally, open the large alcohol bottle so it can receive bees.

8. Open the colony so that you can examine the brood nest. Inspect the colony and examine for disease and queen status. Record any observed disease or queen conditions on data sheet.
9. Find a frame containing at least some uncapped brood. It is also important that this frame does not contain too much honey to prevent damaging the frame later in this procedure.

Ensure the queen is not present on this frame as you do not want her to be part of the sample.

If no brood is present, and another colony is available, do not sample the broodless colony, but choose another colony with brood.

If no other colony is available, use a frame from the center of the brood nest.

10. Shake bees vigorously from the frames into the wash tub.
11. Bump the wash tub to gather bees into one corner of the tub.

12. Scoop $\frac{1}{4}$ cup of adult bees into the funnel inserted into the lid of the live bee shipping box.

Gently tap the box to force the bees from the funnel into the box.

Scoop a second $\frac{1}{4}$ cup of bees from the tub into the funnel that is now inserted into the large bottle containing alcohol. Tap the bottle and funnel to force the bees into the bottle.

Once the two samples are taken you can return any leftover bees to the colony.

Check the frame and shake it again over the colony if a large number of bees are clinging to the comb.

13. Take the frame and hold it over the collection pan, with one surface of the frame facing down.

Firmly knock the outer edge of the frame twice against the pan to dislodge mites, beetles and other hive debris from the frame into the collection pan.

Knock the frame a second time.

Now turn the frame so the frame surface is facing down.

Knock the frame twice.

Turn the frame again and knock the frame twice.

Turn the frame a last time and knock the frame twice.

Each frame should be turned 3 times, so that the frame is knocked a total of 8 times.

How hard you knock the frame is important, please hit the frame hard against the pan to “knock” off any potential mites.

This knock test is meant to dislodge any *Tropilaelaps* from the frame. While *Tropilaelaps* reproduce in capped brood, there are sufficient numbers of them running on the comb to allow for detection.

We do not expect to find *Tropilaelaps* in the United States.

14. Place the brood frame back into the colony.
15. Close the colony.
16. Repeat these steps until all 8 colonies in the apiary have been sampled.

Note, we are sampling at the apiary level, so samples from all colonies are being placed in the same live shipping box and large alcohol collection bottle.

Also, the debris from the 8 frames from the 8 different colonies is being knocked into the same collection pan.

17. Now take the nylon filter and dampen it to prevent it from blowing in the wind. Then fasten it with binder clips to the strainer.
18. Place about 2 cups of water into the collection pan and gently swirl the contents before pouring the water and debris through the nylon filter paper.
19. Pour another 2 cups of water into the collection pan to remove any remaining debris – if necessary use your finger to gently dislodge anything stuck to the bottom of the pan. Pour the contents through the filter.

Finally, use the wash bottle to remove any remaining debris and pass this through the nylon filter.

20. Now, gently remove the nylon filter from the strainer, folding it so that the filtered debris remains secure in the center of the filter. This debris will be examined for mites, specifically *Tropilaelaps*.

21. Gently place the nylon filter into the small bottle containing alcohol and seal the bottle – be sure the filtered debris is submerged in the alcohol.
22. Double check to be sure that the lids of the small and large collection bottles are tight, so they do not leak during shipping.
23. Gently brush away any live bees that may cling to the box. Check all seams of the box to be sure they are flush and that no bees are present. The Postal Service will reject any shipment that has live bees exposed.
24. Remove the funnel from the live bee shipping container and lift the flap so that it is flush with the top.
25. Use clear binding tape, a Postal Service requirement, to secure the lid of the live bee shipping box. Follow the tape guidelines on the box and run the tape around the box twice in both directions.
26. Place the mailing label on the top of the live bee shipping box, and affix the provided postage.

To protect the bees, BE SURE TO KEEP THE LIVE SHIPPING BOX IN THE SHADE AND OUT OF DIRECT SUNLIGHT

27. Take the Live bee shipping box containing the collected samples to the nearest post office during business hours on the same day of collection. The post office must be open to receive this type of package.
28. To ensure the USDA is prepared to receive a live shipment of bees, Email USDA within 24 hours of mailing.

Once the live bee samples arrive at the USDA, they will be placed in a freezer set to minus 80 degrees. At a later date, these bees will be tested for parasites and pathogens using molecular techniques.

The last step in this process is submitting the alcohol samples.

When you have completed sampling all your assigned apiaries, you can send the alcohol samples and data sheets in the provided mailing box.

If possible, photocopy your data sheets so that you have a copy for your records. Place all data sheets in a ziplock bag and place these into the large flat-rate shipping box.

Double check that all the lids of the bottles are secure, and place these in ziplock bags. Place the bottles into the flat-rate shipping box. If the box is not completely full, use newspaper to fill gaps. Then seal the flat-rate shipping box and affix the provided address label and postage.

The filtered debris will be examined microscopically for exotic mites. Finally the alcohol samples will be used to quantify bee parasites and pathogens.

Beekeepers participating in this survey should expect a summary report on the average apiary level of nosema, honey bee tracheal mite, and varroa loads in the sample apiary within six months of sample collection.

A separate report which presents the results from a molecular analysis of the sampled bees should be sent to beekeepers 8 to 12 months after sampling. This later analysis will determine which bee viruses and nosema species are present in the sampled apiary and will screen for exotic honey bee species or sub-species.

That concludes this video and thank you again for your participation.