

# Sugar shaking bees to detect external parasites

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## Introduction

Sugar shaking bees is a method used to detect external parasites, such as varroa mites, tropilaelaps mites and braula fly on European honey bees (*Apis mellifera*). It is a quick and easy field method that does not kill the bees.

The varroa mite legs have sticky pads that help them hold onto the bees. It is believed that the fine sugar particles used in the sugar shake technique break down that bond. The sugar covering the bees stimulates grooming behaviour, further helping the mites to dislodge.

This technique will not detect mites within sealed brood cells. It may also fail to detect very low infestations of varroa mites in hives, so regular monitoring should be conducted.

## Selecting a hive for testing

Choose a weaker hive as it more likely to have been weakened by a potential parasite infestation.

## Equipment required

- Lidded jar, approx. 500 g size, with a lid containing lots of 3–5 mm holes (drilled or gauze) to allow icing sugar and parasites to be tipped out leaving the bees behind.
- Tablespoon
- Cup (approx. 250 mL)
- Icing sugar



**Figure 1 European honey bee with a Varroa mite on its thorax**

- Large sheet of paper or plastic (eg newspaper sheet) or a container to hold water (a small bucket or ice cream container)
- Protective clothing, smoker and hive tool
- Magnifying lens

Equipment required will vary depending on the technique used (refer to the procedure below).

## Procedure

1. Place a large sheet of plastic or paper on the ground beside the hive to be tested.
2. Open the hive and remove a frame from near the centre of the brood area.
3. Check for the queen. If present, place her back in the hive.
4. Shake the bees off the frame onto the sheet, then scoop or pour about 300 bees into the jar, putting the lid on quickly (300 bees = approx. ½ cup of bees).
5. Add one tablespoon of icing sugar through the gauze in the lid. This is

adequate to mix with about 300 bees. If more bees are tested then add more icing sugar in similar proportions.

6. Gently roll the jar containing the bees and sugar for approximately two minutes, ensuring all bees are coated in sugar. Be careful not to lose any sugar while rolling.
7. Leave for a few minutes and gently roll again.
8. Shake out all the sugar (and mites) into a bucket of water or onto a white sheet, leaving the bees behind in the jar.
9. Place the bees back in the hive in case the queen is present. Inspect the empty jar thoroughly for mites.

If the sugar was shaken into water the sugar will dissolve and the parasites will float on the surface. Inspect the water surface thoroughly for parasites. A white container will aid in seeing any parasites.

Alternatively, the water can be gently stirred until all the sugar has dissolved, then poured through filter paper (eg coffee filter). The filter paper can then be carefully inspected for parasites.

Inspection for parasites can also be done on a large sheet of paper (preferably white). The sugar needs to be very finely spread across the paper to ensure any parasites present are seen.

Alternatively, the sugar can then be put through a very fine sieve that will capture the mites while allowing the sugar to fall through. The contents of the sieve can then be examined or tipped onto a white sheet for examination.

Varroa are about 1.1mm long and 1.5mm wide and are reddish brown in colour. It may help to use a visual aid such as magnifying lens when inspecting.

## Reporting

**If you suspect varroa, tropilaelaps mites or braula fly you must notify NSW DPI immediately on the Exotic Plant Pest Hotline 1800 084 881.**

NSW DPI will advise you where to send samples and any further action required.



**Figure 2 Clockwise from top left: Pouring sugar into jar of bees, gently rolling sugar and bees, shaking sugar into bucket of water, placing bees back in hive.**

## Stop the spread!

If you think you may have found an external parasite such as varroa, take immediate precautions to reduce the risk of it spreading.

- Do not send any live parasites through the mail (unless advised by NSW DPI)
- Do not remove suspected infected bees or hives from the apiary
- Check that there are no passenger bees in your vehicle or on your clothing.
- Wash your hands, smoker and hive tool before leaving the apiary
- Place your overalls, veil, gloves and hat in a plastic bag and leave it at the apiary

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Figure 1 courtesy of Scott Bauer, USDA Agricultural Research Service

Figure 2 courtesy of Danielle Lloyd-Prichard, NSW DPI

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