

Alcohol washing is a quick and effective method for detecting the presence and monitoring the level of external Varroa mites within a honey bee colony. Alcohol washing can remove over 90% (with multiple washes) of external Varroa mites present on adult honey bees and can also detect Tropilaelaps mites.



Materials you will need

KEY:

- 1: Solid lid and jar for shaking jar option 1
- 2: Mesh lid for shaking jar option 1
- 3: Shaking jar option 2
- 4: A second container (slightly larger than your shaking jar) for collection of the solution
- 5: Thin durable white filter material for straining the solution and capturing any mites (such as nylon mesh cloth, baby wipes, paint strainer or coffee filter paper) and a means of affixing the filter material to the container (rubber bands, pegs or clips)
- 6: ½ measuring cup to collect 300 nurse bees
- 7: Solution of choice
- 8: Medium-large plastic tub to collect bees shaken off frames (you can also use your hive lid)

Shaking jar options (choose one of these):

- Option 1. Large jar (minimum 90 mm wide) with one mesh lid (2-3.5 mm size mesh) and one solid lid
- Option 2. Large jar (size as above) containing an internal basket and a solid lid

Note: shaking jar must be wide enough such that a mass of 300 bees is not too deep, otherwise mites (if present) will not be able to move through the mass of bees onto the filter material.

Solution options (choose one of these):

- Ethanol or methylated spirits diluted to 75%
 - To make 1 L: add 6 x ½ cups (750 mL) of either ethanol (100%) or methylated spirits, to 2 x ½ cups (250 mL) of water
- Detergent solution (using low suds powdered laundry detergent)
 - 1 Tbsp detergent to 1 L water

Note: Enough solution is required to cover the bees which may vary depending on shaking jar size. Solution can be reused over 2-3 hives, until solution heavily discolours.

Alcohol washing

Directions

- Before opening the hive prepare the shaking jar by adding $\frac{1}{2}$ cup (125 mL) of the chosen solution.
- Open the hive carefully and remove the super and the queen excluder to expose the brood box.



- Remove 1 to 2 brood frames from the centre of the brood cluster to focus on the nurse bees keeping the brood warm as they are most likely to be carrying Varroa mite.

Make sure these frames have a good coverage of brood (capped or uncapped) and lots of bees on both sides of the frames.

- Examine the brood frames for the queen. If present either carefully place the queen back into the hive on an adjacent brood frame, or replace the frame with the queen and select another suitable frame.
- Place the selected frames to the front or side of the hive.



- Shake bees from the selected brood frames into a plastic tub (or hive lid). Some bees will fly off immediately, predominantly leaving behind the nurse bees.
- Quickly double check to ensure the queen is not present inside the tub.



- Hold the plastic tub with the dislodged bees and tap and manoeuvre the tub so all the bees collect into one corner.
- Using a $\frac{1}{2}$ measuring cup, scoop up a sample of nurse bees (approximately 300 nurse bees).



Alcohol washing

Directions

- Sharply tap the scoop of bees into the shaking jar containing the solution.
- If needed, add more solution so the bees are covered.
- Screw the solid lid on the jar.
- Return the remaining bees back into the hive and put the hive back together.



- Set up the second larger container with a piece of material (such as filter paper) depressed to form a cone into the container or a piece of fabric (such as nylon cloth, baby wipes) draped across the opening. Ensure any material used is secured to the container rims, but has some slack to prevent the solution from spilling when poured.
- Once the bees are fully submerged in the solution begin the washing process. The washing process will depend on the type of jar used e.g. shaking jar with mesh and solid lid follow actions under section A or shaking jar with internal basket follow actions under section B.



Section A: Using a large shaking jar with one mesh lid and one solid lid

- A-1: Ensure the solid lid is tightly secure on the jar, and **vigorously shake and swirl the solution in the jar for 15 seconds**. This is the first wash and aims to kill any mites attached to the bees.
- A-2: Remove the solid lid and replace with the mesh lid. Pour the solution into the second container fitted with the white filtering material. Vigorously shake to get all remaining solution out and into the second jar. Bees will remain in the shaking jar captured by the mesh lid, and the solution will pass through the fabric material to the second container. Any mites will be captured on the white material.



- A-3: Once the solution has passed through the material, remove the white filtering material and place to the side, pour the solution from the second container back into the shaking jar with the bees, and replace the mesh lid with the solid lid.
- A-4: **Repeat steps (A1-3) two more times**, completing a total of 3 washes on the sample of bees. The aim of these steps is to wash out any mites that may be trapped by the bees. Any mites captured will be seen on the white material or in the solution.



Alcohol washing

Directions

Section B: Using a large shaking jar with an internal basket

- B-1: Ensure the solid lid is tightly secure on the jar, **shake and swirl the solution in the jar for 15 seconds**. This is the first wash and aims to kill any mites attached to the bees.



- B-2: Remove the solid lid and the internal basket containing the bees and set side. Inspect the liquid from the top to see if any mites are visible. If the liquid is clear and all solid contents easily identified, proceed to B-5.



- B-3: If the liquid is opaque or prohibits easy viewing of mites, pour the solution into the second container which has the piece of white filtering material covering the opening. The solution will pass through the material to the second container, any mites will be captured on the material.



- B-4: Once the solution has passed through the material, remove the material from the container and place to the side. Place the internal basket with the bees back into the jar, and pour the solution from the second container back into the shaking jar, and secure with solid lid.
- B-5 **Repeat steps (B1-3) two more times**, completing a total of 3 washes on the sample of bees. The aim of these steps is to wash out any mites that may be trapped by the bees. Any mites captured will be seen on the white filtering material or in the solution.



Alcohol washing

Reporting

- Always perform a thorough inspection of the liquid and white filtering material for the presence of any suspect mites as you work.
- Record details including date, apiary location, hive number, and results. How to submit your results and samples is explained on your State or Territory government department of agriculture website.
- a. If no mites are found, dispose of dead bees and any other hive debris. Making sure all equipment and material used is thoroughly cleaned.
- b. If any mites are suspected, keep the sample, and report the finding immediately to the relevant State or Territory government department of agriculture agency through the **Exotic Plant Pest Hotline 1800 084 881**.



General safety and biosecurity considerations:

- Reduce cross contamination and spread of pest and diseases between bees, hives and apiaries, always work with tools and equipment clean and free of hive debris.
- Always follow relevant jurisdictional requirements and legislation including biosecurity orders, disposal process for bee material, and any fire conditions/bans.
- This activity involves the use of flammable liquids, ensuring fire controls are easily accessible.



It's time to bee aware

If you see anything unusual, call the Exotic Plant Pest Hotline

**EXOTIC PLANT PEST HOTLINE
1800 084 881**