VARROA MITE

DETECTION AND SAMPLING

Alcohol/ Soap Shake	Powdered Sugar Shake	Brood Sampling	Mite Fall
Submerge a sample of bees in alcohol or soapy water to dislodge varroa.	*Dust bees with powdered sugar to encourage grooming and mite fall.*	*Look inside capped cells to check for presence of the varroa mite.*	*Monitor the passive drop of mites using a screen bottom board.*
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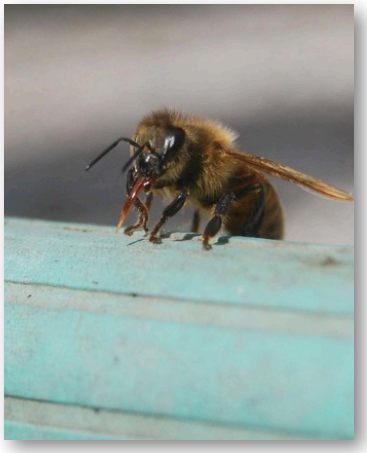
The varroa mite (*Varroa destructor*) is a serious pest of honeybees. As an external parasite, the varroa mite feeds on the hemolymph of adult workers, drones, and developing honeybees. Reproduction of varroa occurs within the capped cells of developing honeybees, with drones having a higher infestation rate than worker bees. Colonies infested with varroa will show symptoms of varroasis: spotty brood, disfigured and deformed wing bees. Within 2 years, a colony with varroa can collapse and die. Varroa was first detected in the United States in Florida in 1987 and quickly spread to other states throughout the country. Due to geographical isolation, Hawaii was free of this parasite for many years. However, in 2007, the mites were detected in Hawaii on the island of Oahu, and soon after, on the island of Hawaii in 2008.



It is important for beekeepers to detect the arrival of varroa to their apiaries and to subsequently monitor their yards regularly for changes in varroa mite levels. Sampling for mites is an important part of any IPM strategy to combat varroa, as infestation levels will help determine if and when colonies are treated. Keeping varroa mite levels low will promote colony health and productivity.

Varroa and Viral Diseases in Honeybees

Varroa mites are vectors of viral diseases that affect the development of honeybees. At high infestation levels, symptoms (spotty brood pattern, shrunken abdomens, and deformed wings of worker and drone brood) from viruses can be seen throughout the colony.

METHODS

Alcohol / Soap Shake

The alcohol or soap shake targets phoretic mites that are attached to adult honeybees. Mites are dislodged and killed, then separated from the honeybee sample. This method sacrifices approximately two hundred bees from the colony.

This sampling method is quick and accurate, especially when brood levels are low and the majority of the mites can be found feeding on the adult bees.

- Brush or shake approximately two hundred bees into a glass or plastic jar containing two hundred milliliters of alcohol (isopropyl or ethyl) or dishwashing detergent soap.
- For a precise measurement, shake bees into a bucket, then scoop up the bees with a measuring cup (1/2 cup = 200 bees).
- Shake jar vigorously for one minute.
- Filter contents through a sifter or a wire mesh screen (#8, 3 mm) and examine for mites.
- Additional rinsing with water may be required as mites may still be attached to the wings and/ or other body parts of the honeybee.

Powdered Sugar Shake

Powdered sugar can be used to dislodge mites from adult bees. Unlike using alcohol or soap, powdered sugar is a non-lethal method and will not kill the bees in the sample. Coating the bees in powdered sugar will stimulate grooming behavior in bees, thus removing mites. In addition, powdered sugar clogs the tarsal pads causing the mites to lose their grip and dislodge from the adult bees. Not all of the mites in the sample will necessarily be removed from the bees. Approximately 10% or more of the mites may remain on the bees.

Modify the cover of a wide mouth Mason jar by installing a #8, 3 mm wire mesh screen. Brush or shake approximately 200 bees into the Mason jar. Pour 1 teaspoon of powdered sugar through the cover of the wire mesh. Roll the jar ensuring each bee is coated in powdered sugar. Invert it and shake vigorously into a container (white is preferable). Count the number of mites that fall. Open the jar, and pour out bees in front of the hive entrance.

METHODS

Brood Sampling

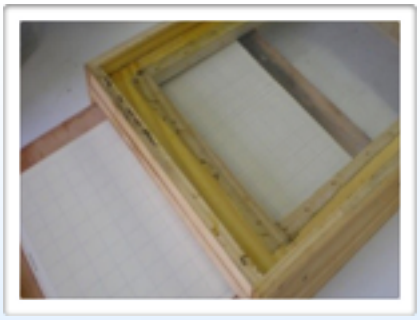
During brood production, approximately 80% of varroa reside in the cells of brood larvae. Taking a random sample of brood larvae can be used to detect the presence of mites in a colony. Since varroa mites prefer drone cells over worker cells, sampling drone brood can give an accurate estimate of the infestation level. However, at low level infestations, detection of the mite can be difficult. Drone sampling is obviously limited by the reproductive cycle of the colony.

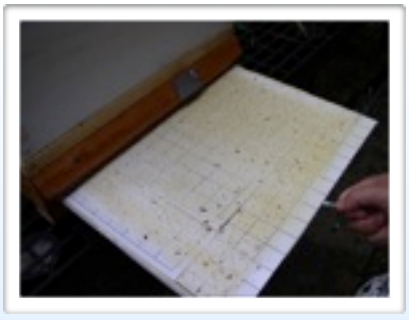
- Use a capping scratcher to remove 50 – 100 drone pupae. If no drone cells are available, worker pupae can be sampled.
- Search for mites on each individual pupae or cell. Feces (white spots) can also be present in cells containing mites.
- Since mites prefer to utilize drone cells, a drone frame (an empty frame can also be used) can facilitate the detection of varroa mites.
- Once the frame is used and the drone larvae are capped, remove the frame and sample larvae with a capping scratcher.

Mite Fall

Varroa mites will fall off of honeybees due to death, or by honeybee grooming. This passive mite fall can be used as a detection method as well as a means of monitoring the varroa levels in a colony. A sticky board is placed below a screen mesh allowing for daily or weekly counting of varroa mite. To increase mite fall for detection of a new or low infestation, powdered sugar, or an acaricide can be used in conjunction with the screen bottom.

Install a screen bottom board (#8, 3 mm wire mesh) with a sticky board below the screen. A poster or plastic board can be covered with any sticky substance (Tanglefoot, Crisco, or Vaseline) and be used to trap mites after they fall through the screen. After one to seven days have passed, remove the board and examine it for mites. Leaving the board under the screen for over a week can result in lots of hive debris accumulating on it and can make detection difficult.





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