



# Apiculture Factsheet

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## Factsheet #222

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### VARROA MITE DETECTION METHODS

Effective mite control depends on frequent and reliable mite detection. Varroa mites spread rapidly between hives and apiaries due to drifting, robbing and hive movement. Mite levels often rise rapidly in late summer and early fall. In heavily infested areas, mite levels can grow from being undetectable to catastrophic levels within a couple of months.

#### **Which Colonies to Test**

In small apiaries each colony should be tested regularly for mites. In larger apiaries, a few randomly selected colonies should be earmarked as “test colonies” for the season and tested regularly. When test results signal the need for treatment, all the colonies of the apiary should be treated. Commercial beekeepers should test at least 10% of colonies in each yard regularly. In all cases, unusually large or small colonies should be tested.

#### **When To Test**

Varroa mites have become endemic in all areas of BC. No matter how isolated the apiary, the beekeeper must assume that mites are in the area. Varroa’s high virulence demands frequent monitoring from early spring to fall. Test every 4-6 weeks from the start of the beekeeping season to the fall.

#### **TEST METHODS**

Each detection method has advantages and disadvantages. Whatever method used, it is recommended to;

- **Use the same testing method through the entire season,**
- **Keep a record of each test result. While the actual number of counted mites is important, it is equally important to be aware of mite population trends.**

Common detection methods and required equipment:

1. **Icing Sugar Shake Method** – jar with screened lid, icing sugar, fine sieve, water, bucket
2. **Alcohol Wash Method** – jar, wiper fluid, wire-screen, fine sieve, bucket
3. **Icing Sugar / Sticky Board Method** – Icing sugar, sticky board
4. **Drone Brood sampling** – decapping fork
5. **24-hour Strip / Sticky Board Method**
6. **Sticky Board (only).**

Each method is described below with an indication of its accuracy.

### 1. Icing Sugar Shake Method

- Widely used method as bees are not killed. Easy, quick, and reasonably accurate. Allows for calculated estimate of mite infestation.
- *To adopt this as a standard testing method, first select a jar with sealable lid. Collect 300 dry, well-preserved dead bees and mark the level on the jar with a felt pen. Cut the lid and glue in wire-mesh.*
- Collect live bees from the brood area up to the marked level of the jar. (*Make sure the queen is not included!*). Close the jar with the screened lid. Add about 100 ml of icing sugar.
- Gently shake the jar with bees for about 2 minutes.
- Turn the jar upside and gently shake icing sugar with mites onto the fine sieve.
- Repeat by pouring about 100 ml icing sugar to the bees in the jar again and repeat gentle shaking. After a couple of minutes, pour icing sugar onto the sieve.
- Pour water over the icing sugar to dissolve.
- Count the mites and record.
- Open the jar and pour the icing-sugar coated bees into the hive. The bees will clean themselves and remove the icing sugar.

#### **Mite Level Determination:**

***A mite count of 9 – 10 mites represents 3%. This level represents the “Economic Threshold Level” and treatment should be applied. Any higher mite counts call for prompt treatment. Note; Any higher mite counts may not guarantee of colony survival after treatment.***

### 2. Alcohol Wash Method

- This method is essentially the same as the Icing Sugar Shake method except alcohol is used.
- Scoop live bees from the brood area up to the marked level of the jar.
- Add about 100 ml (~ 3 oz) of windshield wiper fluid and gently shake for several minutes. Avoid spillage.
- Turn the jar upside down and pour contents over the fine sieve. The wire-mesh screen will catch the adult bees, while the sieve will catch mites. Repeat procedure.
- Count number of mites and record.

***Mite Level Determination: Same as Icing Sugar Shake method.***

### 3. Icing Sugar / Sticky Board Method

- Most suitable during summer season as a quick test to determine low or high mite levels.
- Install sticky board on the bottom board. (*Commercial sticky boards are available. Home-made sticky board can be made using a 18” x 12” sheet of corrugated white plastic. Spray thin layer of baking oil (~PAM). After test, use squeegee to remove oil and mites.*)

- Remove honey supers first. Sprinkle a cupful of icing sugar at the top of spaces between brood frames. When colony has two brood chambers, only apply to the second chamber. Reinstall honey supers.
- Remove sticky board after 24 hours, count mites and record.

***Mite Level Determination: Low***

#### **4. Drone Brood Sampling Method**

- Easy, quick but only offers an estimate of low or high mite levels. Method should not be used as primary detection method.
- Sample about 100 capped drone cells in the purple-eye pupal stage. Slide the prongs of a de-capping fork along the comb face and into the protruding drone cappings. Pry upward and remove the pupae. Carefully examine the drone bodies and the interior of brood cells for mites.



#### **5. “24-Hour Strip & Sticky Board” Method**

- Test method includes the installation of a miticide strip which treats the entire colony for 24 hours. The test only indicates low or high mite levels but doesn't allow for a calculated estimate.
- Install one strip per nucleus or two strips for a standard two-supered hive, between central brood frames. Daytime temperatures must be 10 degrees C or higher. Strips and sticky board must be removed after 24 hours.
- *Mite strips may include; Apivar (amitraz), Apistan (fluvalinate), CheckMite+ (coumaphos), Bayvarol (flumethrin).*

***Mite Level Determination: There is no fixed value for when to treat because the size of the colony is not known. In general, when there are 300 mites on a sticky board, treatment is recommended.***

**Note:** *Strips that are only used for detection purposes (and not for 6-week treatments) may be re-used a few times for 24-hour tests before disposal. Make sure that the strips are not exposed to sunlight. Store in a marked container in a cool, dry and dark place.*

## **6. Sticky Boards**

- The installation of a sticky board on the bottom of the hive by itself is NOT an effective method to determine mite infestation levels (unless very high).
- *Sticky boards are only recommended for use in combination with miticide strips or formic acid.*

For information about **Varroa Mite Controls**, refer to **Bulletin #221** at:

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