

Oxalic Acid Treatment for Varroa Mite Infestation

IMPORTANT: *Developing a Varroa Mite management strategy is essential to keeping your bees alive and healthy. Adopt a mite testing method that works for you, then treat only when necessary. Over-treating and treating when not necessary contributes to disease resistance. Sample your bees, document their disease levels, and treat accordingly.*

Free Varroa testing is available at Washington State University's Apis Lab:
<http://entomology.wsu.edu/apis/diagnostic-lab/>

Background information:

Dihydrate of oxalic acid, a common wood bleach, is dissolved in a 50% sugar solution for the dribble method. Use distilled water or you could get a solution clouded with insoluble calcium oxalate.

Oxalic, although a weak acid, is still an acid and one has to be very careful to thoroughly rinse away all traces of powder or solution. **Rubber gloves, eye protection and respirator are advisable.** Apply a room-temperature solution to the seams between frames, usually about 40 ml to a medium colony with 5 good frames of bees; Never use more than 50 ml even for a strong colony and never more than a single treatment per year.

Treatment information:

- Oxalic acid treatment should be applied only once a year.
- Oxalic acid can be applied at cool temperatures, either through vaporization (crystals heated and converted directly into a gas vapor) or trickling an acid-sugar syrup solution onto the bees.
- Oxalic acid (Oxalic acid dihydrate) should only be applied in late fall when the colony has no brood. Any open brood in the colony is likely to be killed by oxalic acid.
- Oxalic Acid is available inexpensively at hardware and paint stores as a wood bleaching agent.

No. of colonies	1:1 Sugar solution	Oxalic acid crystals
5	0.25 L (1 cup)	9g (2 ¼ teaspoons)
10	0.50 L (2 cups)	18g (1 ½ Tablespoons)
20	1.00 L (4 cups)	35g (3 Tablespoons)

Safety information:

- Even though the product is not as volatile as formic acid, **always wear rubber gloves, safety glasses and a respirator when handling the product. Avoid inhalation of vapors. Keep the wind at your back if possible.**
- Screened Bottom Boards should be covered with a plastic slider on TOP of the screen to

avoid damage from the acid. Carefully remove screen after treatment and neutralize with baking soda solution.

- Read the caution statements on the bottle.

Drizzle Method

Part I (at home)

1. Prepare sugar solution at a 1:1 ratio, by weight, for the number of colonies you are going to treat. Remember that each colony receives no more than 50ml.
2. Prepare 2 cups of water with $\frac{1}{4}$ cup baking soda dissolved in it as a neutralizing solution. Set aside to neutralize utensils or to deal with spills.
3. Measure out appropriate amount of oxalic acid for the number of colonies you are going to treat. Be sure to wear rubber gloves and eye protection.
4. Grind the oxalic acid with mortar and pestle if desired. This helps it dissolve better.
5. Add oxalic acid crystals to the **lukewarm** sugar solution and stir gently with a plastic or rubber utensil until fully dissolved. This may take up to 10 minutes. Stir until the solution is crystal clear. The sugar syrup solution will now have an acid concentration of 3.5%.
6. Let solution cool to room temperature.
7. Neutralize any equipment that came in contact with oxalic acid.
8. Clean everything thoroughly with soap and water avoiding contact with your skin.

Part II (in the apiary)

1. Fill a syringe or applicator with 50ml of solution. Locate the cluster by looking directly down between the frames. Trickle 5 ml of solution directly onto the bees in each of the **occupied** bee spaces between frames in each brood box. Do not remove frames, just trickle down between them.

The maximum dose is 50 ml of acid solution per colony whether it is a nuc, single or multiple brood chambered hive. **Use only as much as you need!** That will usually be LESS than 50ml.

2. Close up treated hive. Open the next hive. Top up your syringe or applicator to 50ml and repeat the process.

Vaporizer Method:

Oxalic Vaporizers are available online. They require considerably more care and judgement than the "drizzle" method. They are NOT cheap! The instructions below

are cursory because none of us preparing these instructions have ever used this method.
Note: Talk to Pete Sallee as he has experience.

In the apiary

1. Seal all upper hive entrances and cracks, and reduce the main entrance.
2. Smoke bees up from the bottom board.
3. Place 2 g (1/2 teaspoon) of oxalic acid dihydrate into the vaporizer. Insert vaporizer through the bottom entrance. Follow manufacturer's instructions for vaporizer use.