



# It's Time for the OA Drench!

## Here's how

by ELEANOR SCHUMACHER

Oxalic Acid has become one of the most popular miticides American beekeepers use. This organic acid is especially valuable because it doesn't build up in the wax, making it a safer choice for bees in the long run. But a lot of beekeepers are worried about the safety of oxalic acid for human health. It's well known that the vaporization technique of treating for varroa mites has to be done very carefully. Oxalic acid is a very strong acid — on the pH scale of 0-14, OA registers at 1.4. Beekeepers need to wear protective gear, like gloves and goggles, and above all, use the correct respirator — either a full-face or a half-face mask with organic acid/acid vapor cartridges. Beyond that, some of the vaporizer wands designed for insertion into hive entrances have caught frames on fire when the comb and wooden frames get too hot from the wand. For these reasons, some beekeepers are afraid of oxalic acid, and miss out on this great treatment — a treatment for which mites haven't yet developed a resistance.

At this point, I'll admit it. I am one of the beekeepers afraid to use oxalic acid. I've heard horror stories about beekeepers getting rushed to the hospital after an accidental whiff of OA, or hives going up in flames. But I won't be ashamed! There are bunches of us in Illinois, afraid to use the OA vapor technique. So many of us, in fact, that we might start a club next year at the ISBA Fall Meeting. Mid-November is the perfect time to get together to plan our alternate oxalic acid treatment strategy. We may call ourselves the "OA Drenchers Club." Our fellow beekeepers may call us "Polar Bears," doing the unthinkable

— drizzling sugar syrup directly onto our bees — in the cold!

The drench, also known as the dribble method, is a very particular treatment. It's only appropriate to perform the drench when the colony is broodless, because the acid is known to kill brood. This treatment may also kill a small percent of your worker population, so it should only be performed once annually, and shouldn't be done on very weak colonies or small, struggling clusters.

Outdoor temperatures should be cold. The drench works best when bees are tightly clustered. Dr. Marion Ellis, researcher from the University of Nebraska, recommends performing this treatment when temperatures are between 32 and 41 degrees Fahrenheit. While it sounds counterintuitive, and against every rule of beekeeping, to crack into a cozy, propolized hive to shower your bees with syrup in the winter, there are beekeepers worldwide who have routinely drenched their bees in these temperatures, as well as temperatures dipping into the 20s, and their YouTube videos and anecdotal testimonies can be found all over the internet. That said, common sense will ensure that most of us will look for that warm 40-degree day between Thanksgiving and Christmas to drench our bees.

Now we move to the important questions: Where do we purchase oxalic acid? How do we administer the treatment? What does the label say? First, it's common knowledge that oxalic acid has been around for a long time, widely available at the hardware store in plastic jars labeled "Wood Bleach." But if Grandpa used generic wood bleach to brighten his

deck, and then turned around and drenched his bees with the same product, he was breaking the rules, and might have hurt his bees.

Oxalic acid for the treatment of varroa mites has to be between 95% and 100% pure to be safe for bees and effective against mites. Popular blogger Rusty Burlew of "Honey Bee Suite" discusses this in her helpful guide to the oxalic acid drench. She mentions that her go-to oxalic acid of choice is Savogran 10501 Wood Bleach, which is 99.6% pure. She also mentions that other brands should have their purity information on their MSDS (Material Safety Data Sheet) label. Per the Illinois General Assembly's Illinois Pesticide Act (415 ILCS 60/1 et seq.), "All products offered for sale within the state of Illinois that make a 'pesticidal' claim must be registered with the Illinois Department of Agriculture." So, oxalic acid products without specific labeling for varroa mite control are not permitted for use in beehives per the Illinois Pesticide Board. That said, Illinois-legal oxalic acid is widely available and easy to come by. For example, inexpensive Brushy Mountain Oxalic Acid packages are still available at Dadant Beekeeping Supplies, but newer on the market is Api-Bioxal, neatly packaged with very clear instructions for use.

### ON TO THE INSTRUCTIONS:

Based on what was mentioned above, you will follow oxalic acid product label instructions when you administer varroa treatment for your hive. However, for review (and for Grandpa's sake), here we will share instructions for the oxalic acid drench method, beginning with the USDA

Agricultural Research Service's Bee Research Laboratory label for the common chemical Oxalic Acid Dihydrate, approved by U.S. EPA in 2015. Then we will discuss tips distilled from other popular authorities, including Marion Ellis, Randy Oliver, and Rusty Burlew.

**OXALIC ACID DIHYDRATE FOR VARROA MITE CONTROL ON BEES (EPA REG. NO. 91266-1)**

**Personal protective equipment for the drench method:** Long-sleeved shirt and long pants, socks and shoes, chemical-resistant gloves, goggles, and half-face respirator with cartridge and/or particulate filter.

**Mixing the Solution:** Dissolve 35g of Oxalic Acid Dihydrate in 1 liter of 1:1 sugar and warm water. Smoke the bees down from the top bars. With a syringe or an applicator, trickle 5 ml of this solution directly onto the bees in each occupied bee space in each brood box. The maximum dose is 50 ml per colony whether bees are in nucs, singles, or multiple brood chambers. Under certain unfavorable conditions (e.g., weak colonies, unfavorable overwintering conditions), this application method may cause some bee mortality or overwintering bee loss.

**TIPS FROM THE PROS:**

**Measure in grams:** The vast majority of instructions for the OA drench solution measure OA crystals in grams. While it is true that Randy Oliver's OA treatment table includes three different recipes, resulting in three choices of OA drench strength, and while a simple recipe using American kitchen measurements does exist (one ounce of oxalic acid, or two tablespoons to 1½ cups of sugar and 1½ cups of water will create a mixture for 15 hives), the OA solution should be measured by grams.

**Use distilled water:** Not sure if you have hard water, or if your water is mineralized? You might want to make a small test batch of OA solution to find out. OA reacts with certain minerals — especially calcium, which bonds with the acid, making deposits, and keeping it from dissolving properly. A white substance in your mixture will show that your water is too mineralized for use in your OA solution.

**Stirred, not shaken:** The OA mixture can build up pressure when shaken, and could burst from the mixing container in unpredictable ways

(i.e., in your eye). To be safe, stir the mixture, and stir until the OA crystals are dissolved.

**Use a syringe with clearly visible 5 ml measurements:** According to Randy Oliver, it's easiest to dispense 5 ml of OA solution evenly over each seam of bees using a 60 ml syringe. These syringes are easy to come by — they can be picked up at any feed store. Because some syringes are measured in increments of 10 rather than 5, beekeepers need to take care not to over-apply; 5 ml is the maximum amount per seam of bees — more will hurt them.

**Work with a partner:** This time of year in the Midwest, bees have ideally stored away a deep full of capped honey, or at least a whole bunch of overhead stores. To dribble the OA solution directly on the bees, you will often need to lift the top deep to get to the cluster. A hive with a top deep full of honey will be easier to treat, with all of the bees clustered in the bottom box. However, it's highly probable that the cluster will be split between both the top and bottom box, and the drench will need to be applied to both *top and bottom* of the cluster. This means one person will tip the top box up, while the other divides the 5 ml-per-seam solution between all seams in the cluster of the bottom box, and then the seams in the replaced top box. In other words, the 50 ml will be split between boxes, with more of the solution spent on the box with the larger bee population.

**Look for results:** If you use a screened bottom board with a mite board or tray, take time to admire your work — look at your mite drop. An oxalic acid drench performed in a broodless winter period is documented as being between 90% and 95% effective. You'll be able to observe a significant number of mites dropping for up to one week.

**Don't over-drench!** That 5 ml per seam is the maximum amount of solution tolerable to the bees. More is not better. Also, this treatment is only safe to perform once annually. OA is a very strong acid, and the drench solution has a much stronger effect than vaporization. It can be additionally harmful if performed on a colony without honey stores. Hungry bees will choose to digest more of the solution, which is harder on their gut.

The November/December application of an oxalic acid solution is a critical weapon against varroa mites. When the colony is completely brood-

less, all of the mites are exposed and vulnerable to the acid. While oxalic acid can inflict a little harm on the bees, the mites are far more susceptible to oxalic acid, and the trade-off of a slightly shortened worker lifespan is worth it. If you've wanted to use oxalic acid to knock your mite population down but you've been afraid of this powerful chemical, suit up and give this simple treatment a try. Hopefully you have found enough information here to go out and give your bees something they really want this holiday season — a virtually mite-free winter.

For more information, Randy Oliver's many articles on oxalic acid and the dribble method (<http://scientificbeekeeping.com/>, search "oxalic acid") can supplement and tell you more, and so can his Oxalic Acid Treatment Table, which lists three different strengths of drench application, with easy-to-follow solution ratios.

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