Instructions for extended-release oxalic acid

Extended-release oxalic acid for varroa management This method of application of oxalic acid is not yet approved by the EPA, and I do not in any way advocate any unapproved use in bee hives. However, EPA does not require an Experimental Use Permit for a limited number of hives. Check with your State Lead Agency for your own state's restrictions. Safety Although oxalic acid is not as reactive as stronger mineral acids, it can still cause eye damage, and if left on the skin, tissue damage. Always wear safety glasses and waterproof gloves during preparation, and be careful to avoid splashing. After preparation or application, wash your hands and equipment with soap and warm water to remove any acid residues, or better yet, neutralize any acid on hands, hive tools, or smoker with a solution of 10 heaping tablespoons of baking soda per gallon of water. 2/3 Dosage and delivery matrices For extended-release application of oxalic acid, it can be dissolved into glycerin, and applied to the hive by either laying pads across the top bars (if applied between two brood chambers), or by hanging strips over the top bars, extending down into the interspaces between the frames. The delivery strips or pads must be applied so that bees freely contact the surfaces. Biodegradable cellulose matrices such as cardboard (chipboard), Swedish sponges, or cotton absorbent fabrics may be used. For full efficacy, roughly 55 square inches of delivery matrix must be used if applied across the top bars, or 100 square inches if hung between the frames. The instructions below are for moisturizer-free Swedish sponges, which hold 100 g of 1:1 (weight to weight) solution of oxalic acid dihydrate to glycerin. Other matrices, or different ratios of acid to glycerin, will require different preparation. Preparation For extended-release application, oxalic acid can be dissolved in glycerin, absorbed into any number of absorbent matrices. Field data suggest that for a double-deep hive, there should be roughly 60 square inches of matrix, holding roughly 100 g of 1:1 OA:glycerin (weight to weight), although other ratios may be used (the higher the ratio of glycerin, the more rapidly the OA is dispersed upon the bees, sometimes with adverse effects). For cardboard strips to be hung over the top bars, it will require more total surface area to hold the same amount of solution. To prepare enough Swedish sponge pads to treat 10 full-sized colonies in double deep boxes: First prepare the sponges by cutting them in half (into 3½" x 8" pads), each of which will absorb 50 grams of the solution (50 g oxalic acid dose per hive). Wear safety glasses and waterproof gloves when preparing the solution. Have a neutralizing solution of 10 heaping tablespoons of baking soda dissolved in 1 gallon of water on hand, to neutralize any spills. Place 500g OA dihydrate into a stainless steel pan, then add 500g (400 mL) vegetable glycerin (add the glycerin second in order to avoid splashing of the solution). Place the pan over a low/medium heat (preferably using a double boiler), and heat the ingredients while closely monitoring the temperature, not to exceed 160°F (the acid crystals will dissolve at as low as 110°F, and start to bubble if the temperature exceeds 170°F). Occasionally stir gently until the acid crystals are completely dissolved and the solution is completely clear. At that point, remove the pan from heat. 3/3 While the solution is still hot, either (A) add twenty (20) (3½" x 8") absorbent cellulose pads (or fifty (50) 1.25" x 15" cardboard strips) on edge into the pan and allow them to absorb the solution, or (B) place the pads into a separate plastic container and slowly and carefully pour the still-hot solution over them. With either method, you may need to use tongs to carefully turn the pads over to obtain full absorption (which must take place before the solution cools). Be careful to avoid splashing of the solution. If all the solution does not absorb, the excess should be drained off before allowing the pads to completely cool. For easier handling, allow the pads to cool for at least a day before application. The oxalic acid will recrystallize during this time, and make the pads easier to handle and apply, with no dripping of solution

(under conditions of high humidity, the pads will absorb moisture and may not “dry out”). The pads can be stored in a labeled sealed container for up to 2 months, by which time the cellulose will slowly start to degrade. Application Optimal timing of this treatment in treatment rotation is to apply the pads into the brood chamber at time of placement of the honey supers. This treatment should only be used once while colonies are rearing brood, rotating with miticides with other modes of action, such as formic acid, thymol, amitraz, or fluvalinate. An oxalic dribble or vaporization can then be used during the winter brood break. Wear waterproof gloves. Using gloved hands or tongs, apply two pads between the brood chambers, placed so as to be within the cluster (avoid placing under a top feeder where syrup may spill, or directly against pollen substitute). Placement of the pads must allow for movement of the bees over both surfaces. The pads or cardboard strips can also be hung over the top bars, inserting them spread between the two brood chambers. For cardboard strips, 3-4 will be needed per brood chamber. For optimal efficacy, the pads must remain in the hive for 60-75 days, or until most of the acid has been distributed. After treatment, remove the pads, handling them carefully, since they will still contain acid. After removal, place the spent pads into a plastic bag or container for transport, and rinse your hands, hive tool, and smoker with neutralizing solution. Dispose of the spent pads in a landfill, or compost them. Category: Treatments For Varroa 