

Preserving Woodenware in Beekeeping Operations¹

M. T. Sanford²

Traditionally, most beekeepers have used a variety of methods to preserve the woodenware of their colonies. This has included paint and hot wax and in Florida where the climate and insects (termites) are especially hard on hives, wood preservatives. The primary rules to follow to maximize woodenware life are:

1. Place hives on stands above ground to avoid moisture and subsequent decay.
2. Place hives on stands above ground to avoid termite damage.

Painting Bee Hives

Generally two coats of a good quality latex paint are used on the OUTSIDE ONLY of woodenware used in beehive construction. The inside is not painted to allow the wood to absorb excess moisture produced by the bees. Special attention in painting hives must be paid to the joints and exposed end grain. Many persons soak the ends in water-repellent preservative before assembling and painting.

Using Wood Preservatives

As more and more information becomes available concerning wood preservatives, it is clear that choices are becoming limited. Most recent information reveals that the Environmental Protection Agency (EPA) is taking a closer look at what beekeepers are treating their hives with. At least one bee supply outlet has been restricted to one material by EPA. There is significant evidence that residues from materials have been found in bees, brood and wax. Finally, some materials have been found to be highly toxic to the bees themselves.

A paper by M.A. Kalnins and Benjamin Detroy, "Effect of Wood Preservative Treatment of Beehives on Honey Bees and Hive Products," *Journal of Agricultural and Food Chemistry*, Vol. 32, pp. 1176-1180, 1984 makes some provocative conclusions:

Experiments show that hives treated with creosote, pentachlorophenol (PCP), tributyl tin oxide (TBTO) and chromated copper arsenate (CCA) were associated with adverse effect on bees and left residues of preservative chemicals in bees, honey and wax. All were also associated with poor winter survival of

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 2. M. T. Sanford, professor/extension entomologist, Entomology and Nematology Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

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colonies. In particular, PCP translocated from treated hive to honey, bees and wax (in an increasing order). Greatest concentration of PCP was in beeswax (30 to 55 times the controls, which had detectable levels themselves). This is important as beeswax has a number of uses like cosmetics for which purity is essential.

CCA treatment resulted in elevated arsenic and chromium levels in bees, arsenic in some cases in the lethal range. Chromium levels although elevated were below 1 part per million (ppm) in both bees and honey. TBTO treatment resulted in tin levels of several ppm in bees and wax. The authors suggest, therefore, that beekeepers not use PCP, TBTO or CCA for beehive treatment. CCA could be used only on hive parts not in contact with bees. Any materials with an arsenic component are potentially very damaging to bees.

The authors found few adverse findings resulted from treatments of beehives with a preservative-free water-repellent solution, however, the treatment did not appear to provide long-term protection against decay, something often desperately required under Florida conditions. Thus, the use of preservatives is considered essential by many beekeepers in the state.

A follow-up article by Kalnins and Erickson, "Extending the Life of Beehives With and Without Preservatives," *American Bee Journal*, Vol. 126, No. 7, July 1986, pp. 488-491, indicates that copper naphthenate, copper 8-quinolinolate and acid copper chromate (ACC) are the best preservative options at present.

Copper Naphthenate

Usually sold as a concentrate or solution ready to use. The concentrate is 8 percent copper, a viscous green liquid. For dip, soak or brush application it usually is diluted with mineral spirits or paint thinner to a 1 percent copper solution (temperate zones) or 2 percent copper solution (subtropical zones). It may bleed through some paints and should be allowed to thoroughly dry before being painted.

Copper-8-quinolinolate

Less effective than copper naphthenate, yet less hazardous and can be used to preserve wood contacting foodstuffs (refrigerator cars, food-processing plants). Can be obtained as a water- or solvent-soluble concentrate or ready to use. A solvent-type solution of about 0.045 percent copper is commonly used for brush and dip treatments.

Acid Copper Chromate

Used in some commercial treatment plants, already treated wood can be found in certain areas. It can be applied by brushing, soaking or dipping, but wood is more durable if pressure treated. The authors recommend purchasing commercially treated wood, using dust masks when sawing, and disposing of scrap in land fills rather than burning.

Caution

Most wood preservatives are classified as pesticides and may be injurious to humans or animals, plants, fish or other wildlife. All must be used according to the label which is the law.

Wolmanizing®

Pressure treated or "Wolmanized®" wood is available from many lumber supply houses. Wolmanizing® is a process, and says nothing about what specific chemicals were used in the treatment. There have been reports of significant losses of bees where hives were constructed using Wolmanized® treated lumber. It is, therefore, not generally recommended for beehive use. Those considering such use should carefully investigate the actual chemicals used in the treatment process and their potential effects on bees and resultant hive products.