

## Wax Moth Control<sup>1</sup>

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The greater and lesser wax moths are serious pests of stored honey supers in Florida. The generally mild climate ensures active wax moth populations almost year around. A strong colony of bees will generally keep wax moths at bay. Both wax moth eggs and larvae can almost always be found in colonies, but are routinely eliminated by worker bees and never build to injurious population levels. It is important to remember that large wax moth populations in bee colonies are generally the result of a bee colony being weakened in population for some other reason (starvation, pesticide poisoning, failing queen) which allows the moths to get established. Although generally present in weakened bee colonies, wax moths are not the direct cause of a colony's demise.

Traditionally, wax moth control in stored supers is accomplished by chemical fumigation. The availability and suitability of these chemicals, however, is constantly in flux. They are expensive, may require special training to use, and there is the ever-present chance the chemicals might find their way into the honey.

Several chemical fumigants effectively used in the past are aluminum phosphide, methyl bromide,

ethylene dibromide (EDB) and paradichlorobenzene (PDB). Unfortunately, only two (aluminum phosphide and PDB) remain legal, but their future is in doubt. The chances are good, therefore, that beekeepers will be left without any means to chemically control wax moth.

In every case, it is advisable to buy any fumigants for beekeeping use from bee supply houses; this way full information on use of the substance in beekeeping is available. All pesticides must be labelled for use on stored comb; the LABEL IS THE LAW, and under no circumstances should a pesticide be used if the particular use is not SPECIFIED on the label. Beeswax is similar in structure to many insecticides and often has an affinity for them. As a consequence EXTREME CAUTION should be exercised when using pesticides anywhere near a beekeeping operation.

Alternatives to chemical fumigation have not been found to be practical in large-scale application, but may be useful in smaller outfits. These include the use of hot and cold temperatures, and fumigation with carbon dioxide.

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The following is a chart of temperatures required to kill all stages of wax moth using cold or heat treatment: **C ( F ) ( C ) Time in hours O 20- 7.0 4.5 L 10-12.2 3.0 D 5-15.0 2.0 H ( F ) ( C ) Time in minutes E 115 46 80 A 120 49 40 T** Care should be taken when treating with cold because beeswax becomes brittle and breaks easily. Even more caution, however, is advised when heat-treating. The combs should only have very little honey, must be placed vertically in supers and the heat **MUST** be circulated to avoid hot spots which would melt the wax.

Fumigation with carbon dioxide (CO<sub>2</sub>) is extremely dangerous, not because the chemical is inherently toxic, but because the user is at risk from suffocation. It is not recommended for the amateur! Fumigation for four hours at 98 percent concentration CO<sub>2</sub> 100 degrees F., and 50 percent relative humidity is required.

Some of the worst cases of wax moth damage occur in stacks of supers. This appears to be the ideal environment for the moth larvae, which build up to large populations quickly. Experience with stored comb in many areas of the tropics reveals a smaller wax moth buildup than might be expected. The reason for this has to do with storage technology. The combs in these areas would also be destroyed quickly if stored in supers. However, when separated and suspended on racks under sheds and, thus, exposed to ventilation and light, the combs often suffer little damage. The environment caused by this storage technique apparently is not so conducive to wax moth buildup as when combs are stored in stacked supers.

One beekeeper who routinely stacks supers at right angles to each other so the corners are ventilated and lighted has reported reduced wax moth problems. Although not applicable to every beekeeper's style, this storage technology, providing maximum ventilation and lighting, is one alternative to chemical fumigation that might be explored in the constant search for adequate wax moth control in stored comb.

Older comb is more susceptible than foundation or newer combs. This is another reason for embarking on a regular comb renovation program.