



WAX MOTH

BIOLOGY - PREVENTION - CONTROL



BIOLOGY

Wax moths are a ubiquitous secondary insect pest of beehives. Larvae infest brood or honey frames that have a low bee-to-comb ratio or that are in storage, making this insect a common pest of the beekeeping off-season. They can cause rampant destruction of vacant frames and can even damage the wooden structure of a hive. Dead, weak, stressed, or queenless colonies are most susceptible to wax moth infestation.

The two species of wax moths, greater wax moth (*Galleria mellonella*) and lesser wax moth (*Achroia grisella*), share a similar lifecycle. Gravid (aka pregnant) female moths can lay up to 150 eggs in tiny crevices within the hive (Figure 1). It can take between 3 and 30 days for those eggs to hatch into the destructive larval stage (Figure 2). Larvae then move to the comb structure and spend the next few months consuming honey, pollen, and honeybee brood (Figure 3). Then the immature wax moths enclose themselves in a web-spun cocoon, where they will pupate for 1-9 weeks (Figure 4). Finally, the adult wax moth emerges, mates, and the cycle begins anew. Between 4-6 generational cycles occur each year.

Wax moths are also potential vectors of honey bee diseases, such as American foulbrood (*Paenibacillus larvae*) and various bee viruses.



Figure 1. Adult wax moth.



Figure 2. Eggs and young larva.



Figure 3. Larva in silk tunnel.



Figure 4. Wax moth pupa on frame tops.

BREAKING NEWS:



In 2017, a team of researchers discovered that Greater wax moth larvae are able to eat and break down polyethylene, the same type of plastic used in plastic shopping bags. A flurry of follow-up research has identified enzymes in the larvae's saliva and bacteria in their gut microbiome as causes for this super-ability.

SIGNS OF WAX MOTH DAMAGE



Oblong pitting in the structure of the hive body.



Silk tunnels in the wax foundation.



Visible larvae surrounded by silk.

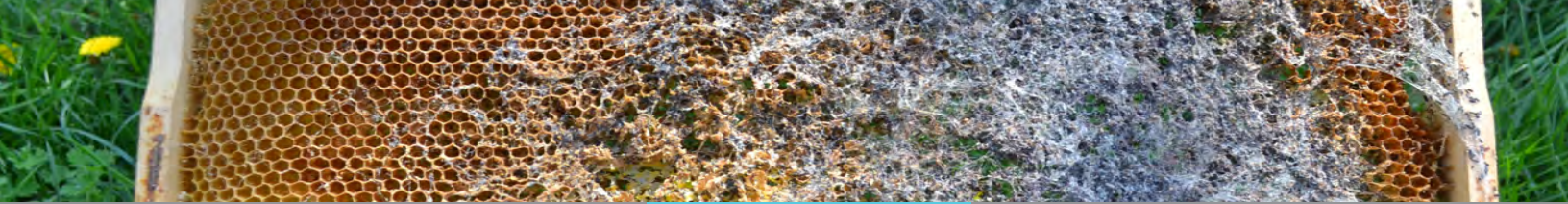


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ag.utah.gov/farmers/plants-industry/apiary-inspection-and-beekeeping
When applying pesticides, always read and follow the label. It is the law!



PREVENTION

&

CONTROL

Healthy honey bee colonies have inherent abilities to control wax moths. Therefore, live colonies can be protected from these pests by maintaining a high bee-to-comb ratio. This is best accomplished by ensuring colonies have healthy queens that produce high-quality brood patterns, keeping Varroa mites under control, treating or culling diseased colonies, and minimizing stress on the colony. It is also important to refrain from putting excessive supers on hives, as this results in too few bees defending too large of an area.



Equipment without bees is particularly susceptible to wax moth attack. Proper storage of hive equipment can discourage wax moths from laying eggs in the first place. Wax moths prefer to lay their eggs in dark, warm, stagnant environments. **Instead of tightly packing stacks of supers together, supers should be kept in an indoor structure (such as a barn, shed, garage, warehouse, etc.) and placed on end with enough space between stacks of supers to allow for light and airflow, as seen in the image to the left.** Some beekeepers opt to store drawn frames suspended from barn rafters or specially-constructed rigs, ensuring that there is ventilation while keeping the frames under cover.

B402 Certan is a biological control agent which uses a subspecies of the microorganism *Bacillus thuringiensis* (Bt) to kill young moth larvae. The product is harmless to humans and honey bees when used according to the label and is 100% effective at preventing wax moth infestations when applied according to label instructions. In addition, B402 Certan does not leave residues in wax or honey, so there is not a contamination risk for beekeeping equipment or products. Be aware that this product is only preventative and cannot control active wax moth infestations.

THERMAL TREATMENTS

This is the easiest way to control wax moths without risk of contaminating honey or hive equipment. All life stages of wax moth, from egg to adult, can be killed by exposing infested frames to any one of these temperature extremes:

Freeze frames

20°F (-7°C) for 4.5 hours
10°F (-12°C) for three hours
5°F (-15°C) for two hours

Heat frames

115°F (46°C) for 80 minutes
120°F (49°C) for 40 minutes

Allow extra time for frames to come to temperature before starting the clock!

Frames should be bagged or stored in an airtight container immediately after thermal treatment to prevent adult wax moths from re-infesting the frames with eggs.

CHEMICAL TREATMENTS

Paradichlorobenzene (PDB) is a registered product for wax moth control under the brand name PARA-MOTH®. PDB is registered for use only in stored comb free of honey. It should not be used in live colonies, nor with stored comb honey. Honey will absorb the fumes released by PDB, making the honey unfit for human consumption. PDB vapors are highly effective at killing wax moth adults, larvae, and pupae, but do not kill wax moth eggs. PDB vapors also act as a wax moth repellent. Hive equipment stored with PDB should be thoroughly aired out before bees are installed, or PDB will kill the bees.

Beekeepers should not use mothballs containing naphthalene to prevent or control wax moths. Naphthalene is not registered for wax moth treatment, making it an illegal substance to use for this purpose.

WORKS CITED & FURTHER READING

UDAF Fact Sheet:
Wax Moth V1.0 (Mar. 2023)

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