

*There's talk on the street, it's there to remind
you
That it doesn't really matter which side you're
on
You're walking away and they're talking behind
you
They will never forget you 'till somebody new
comes along*

-- *The Eagles, New Kid in Town*

Trivia question: according to Reverend Langstroth's original [patent application](#), what was the primary benefit of his new bee hive design? The application itself says:

The nature of my invention consists: 1st, in affording the bees a more thorough protection against the bee-moth.

...

To be able to remove the combs from the hive without mutilating them or seriously disturbing the bees, will secure the following advantages in the management of an apiary: (1st.) The combs may at any time be readily examined for any purpose and thoroughly cleansed from the larvae of the bee-moth.

...

Langstroth went on to explain that by maintaining the proper bee space, wax moths would have no place to hide and lay eggs and moth larvae would have no refuge from the bees. In addition to movable frames and double-paned glass walls, the patent also included an elaborate design for a "trap for excluding moths and trapping worms" that fit into the hive entrance.

Chapter 12 of Langstroth's Hive and the Honey-Bee (4th edition) says, "The Bee-Moth (*Tinea mellonella*) is mentioned by Aristotle, Virgil, Columella and other ancient authors, as one of the most formidable enemies of the honey-bee. Modern writers, almost without exception, have regarded it as the plague of their Apiaries; while in this country its ravages have been so fatal, that the majority of cultivators have abandoned bee-keeping in despair." He went on to repeat anecdotal reports that suggested wax moths weren't



Classic wax moth damage. Note the grey-tinted larvae and the dirty, cottony webbing. Once the larvae are destroyed, this frame could be returned to a strong hive and the bees would clean it up, good as new.

introduced into the United States until the early 1800's, being first reported in Boston in 1806. They then slowly spread, creating havoc among apiaries, reaching western Pennsylvania in 1828 and covering Ohio by 1831.

How the mighty have fallen

When was the last time you gave wax moths more than a second thought? Yes, they can destroy stored comb and we must defend against that. But times have changed and I don't know anyone in our area who still considers them to be "one of the most formidable enemies of the honey-bee." I don't think this is because they are no longer nasty creatures who would love a chance to ravage our hives – they haven't "got religion" and stopped being a threat. Instead, new kids have come to town who make wax moths look like Little Bo Peep. The most recent is the small hive beetle, which occupies nearly the exact same ecological niche as wax moths, but will come in and overwhelm a weak hive before wax moths do. I'm not aware of any research showing that hive beetles are pushing wax moths out of the Southeastern US beehive ecosystem but it seems that could be a long-term possibility.

Should we feel sorry for the former bane of beekeeping? How would you like to be the impetus for the invention of the movable frame

hive, which forever changed beekeeping and is universally used around the world, when nobody pays any attention to you anymore?

Since wax moths are still around and will still cause harm to the unwary, I think they deserve a bit of discussion, if only for nostalgic value. In fact, as I was writing this article, a long-time beekeeping friend asked me for advice on what to do with two of his hives that wax moths had turned into a webby mess. So they may, like Rodney Dangerfield, get no respect, but they still lurk in the shadows.

Life cycle

Wax moths, like honey bees, have four life stages: egg, larva, pupa and adult. The first three stages are spent exclusively within the hive.

The eggs are tiny and not obvious to the casual observer. A female moth lays them in batches in dark, secluded cracks and crevices throughout the hive. A female can lay up to 300 eggs.

The eggs hatch, releasing their larvae, five to eight days after being laid.

It is the larval stage that is destructive. Wax moths exist as larvae for one to five months, depending on the ambient temperature. They spend this time eating organic matter that is found in wax comb: bits of pollen, old cocoons, etc. They do not subsist on the wax itself – in fact a wax moth larva will starve to death on pure wax. This is why comb from empty honey supers that have never housed brood are much less likely to be infested by wax moths than are brood comb.

Wax moth larvae are white when first hatched but darken to grey as they age. Their grey color is an easy way to tell them apart from brown-tinted small hive beetle larvae.

The larvae have caterpillar prolegs along their body, allowing them to move in characteristic inch-worm fashion. This is different than small hive beetle larvae, which only have legs on their front-most segment and so drag their hind-parts around like slugs do.

The larvae burrow through comb like an escapee from “Hungry Hungry Hippo”, leaving



Wax moth cocoons.

web-lined tunnels in their wake. In severely infested comb, all that remains is masses of cottony webbing.

When it is ready to pupate, a larva commonly chews a scalloped depression into a frame or inside surface of the bee box. It then spins a very tough cocoon that is snugly cemented into the divot it has made. Wax moths don't always create cocoons in this sort of chewed-out cavity – they may pupate in the comb or hive debris instead – but this scalloping leaves a permanent sign that your hive has been violated.

Basic management to prevent issues

It is fairly easy to relegate wax moths to a non-issue in your hives by applying the same management techniques you should already be using to control small hive beetles (see [Love a Beetle?](#)). Notably, pay attention to the three S's:

1. **Space:** Do not provide more space in the hive than the bees can patrol. This means, for example, don't stack umpteen empty supers on a weak hive.
2. **Strength:** Don't mollycoddle weak hives; get rid of them by combining them with a strong hive. Treat your colonies with an effective miticide to keep varroa mites and the viruses associated with them from weakening your hives. (See [How Might We Smite Mites?](#)).

3. **Sun:** Keep hives in full sun. Beekeepers like shade but your bees will do much better against pests and diseases in full sun. As a bonus, they'll also tend to be less defensive.

In addition, don't create bee-free pockets within the hive, areas that are safe for moth eggs and larvae but can't be accessed by the housekeeping bees. Remember that Rev. Langstroth said the absence of bug-safe zones was one of the key advantages of his innovative hive design.

If wax moths have damaged a comb but haven't completely destroyed it, don't throw it out. Remove any larvae, pupae cocoons and webbing and then return it to a strong hive. The bees will finish the clean-up and repair the comb.

Perhaps more important than keeping wax moths out of active hives is the challenge we face keeping them out of stored combs. As with small hive beetles, wax moth eggs and larvae can be killed by freezing. So freezing frames and storing them in a bug-proof container is very effective. Wax moths do not like air and sunlight either, so pure-wax comb from honey supers can sometimes be stored in a manner that subjects them to light and air (see page 3 of [Is Tigger Crazy?](#)).

You can also protect comb from wax moths by fumigating it with paradichlorobenzene (PDB). Do not use naphthalene, only use PDB. Stack supers and seal cracks. Place PDB crystals on a piece of cardboard on top of the stack (PDB is heavier than air and the fumes sink). Use three ounces of crystals for every eight medium supers. Replenish the crystals as they dissipate over time. Wax will absorb PDB fumes so you must air out the combs for however long it takes (weeks?) for the smell to disappear before putting them back on the hive.

Summary

Small hive beetles have captured our attention in the past few years, pushing wax moths out of the beekeeper's spotlight. As with small hive beetles, wax moths do not kill honey bee colonies. Like vultures, they come in after



Comb that has been fully decimated by wax moths. There's nothing salvageable here.

the death knell has sounded and they finish off weak colonies. They can be easily controlled with basic management practices, the same ones we are using to control small hive beetles. But let's not forget our old nemesis; wax moths still deserve our respect and attention, if not our fear!

Now for something completely different...

Just in time for fall mite assessment and treatment, the Honey Bee Health Coalition has published a free pdf book, "Tools for Varroa Management", which provides a comprehensive survey of assessment techniques and treatments. Each treatment is described in terms of how to apply, efficacy and advantages/disadvantages. If you have bees, you should have this pdf. It's written by the genuine experts in the field (Dr. Dewey Caron was the principle compiler) and it's free!

Go to honeybeehealthcoalition.org <[here](#)> to request your copy.

Randall Austin is a NC Master Beekeeper who keeps a few honey bee hives in northern Orange County. He can be reached at s.randall.austin@gmail.com.

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