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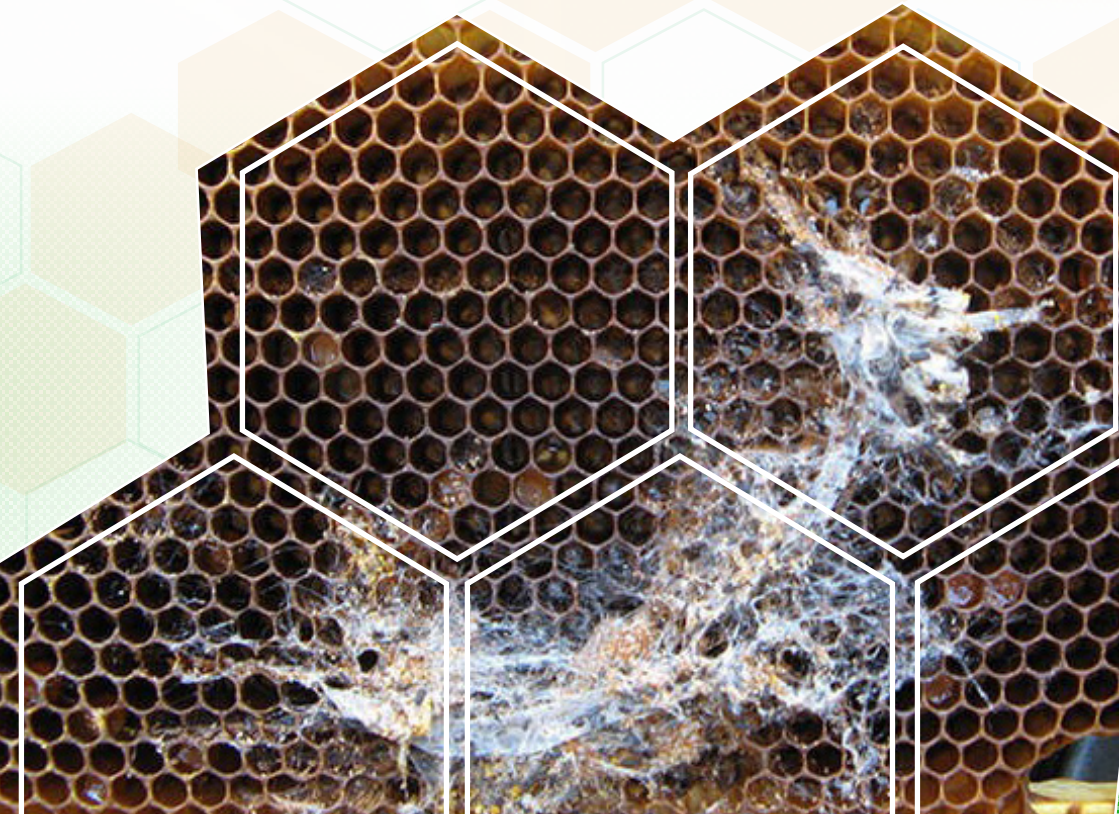
Prevention and control of wax moths



Prevention and control of wax moths

Description

There are two wax moth pests of bees: the greater wax moth (*Galleria mellonella*) and the lesser wax moth (*Achroia grisella*). Both pests are insects belonging to the Order Lepidoptera and Family Pyralidae. Eggs are usually laid near the food source/ the combs, in batches. Greater wax moth eggs are oval, pinkish-cream white or white. For the lesser wax moth, eggs are creamy white and spherical. Eggs will take 5- 8 days to hatch into caterpillars.

The caterpillars of the wax moths are the damaging stage of development. They feed destructively on the wax, destroying brood and honey cells and thus affecting the bee colony development. They complete their life cycle in a hive where they make cocoons inside the hive. The greater wax moth caterpillars develop to reach about 30 mm long while the lesser wax moth may grow up to 20 mm in length.

Once fully grown, the caterpillars identify crevices and areas where they can attach their silks to make cocoons. The cocoons protect them from adversaries during pupation periods. Pupation may take 1-2 months.

The Adult moths of greater wax moths are greyish to purplish brown with body length of 1 cm to 1.8 cm. The adults have dark markings and lead-coloured tips on the forewings; they have pale brownish or yellowish hind wings. Wings are held over the back when at rest. In contrast, the adults of the lesser wax moths are about 1.3 cm long and have a peculiar yellow head while the body is silver-grey or beige.

Greater wax moth adult (L) and caterpillar (R). Photo courtesy of Dr Beatrice Nganso

Lesser wax moth adult (L) and caterpillar (R).). Photo courtesy of Dr Beatrice Nganso

Economic Importance

The wax moth caterpillars are destructive and cause major economic losses to the beekeeping industry. The caterpillars cause losses through their feeding of comb and pollen. Older combs are more frequently attacked or exposed to attack and damage.

The pest has no direct negative effects on human health. Through the destruction of combs and the eating of bee pollen and bee bread, the pests cause a total (100%) loss in hive productivity sometimes leading to bees absconding hives.

The caterpillars of the lesser wax moths are sometimes referred to as beneficial because they often attack abandoned combs of wild colonies/ hives after bee absconding. This destruction helps in reducing the combs from harbouring pathogens and hence helps create a good environment for the next occupants. In contrast, greater wax moth caterpillars are primary pests and their attack results in the absconding of hives, especially for weaker colonies.

Predisposing factors to infestation

Some of the factors that may make a bee colony vulnerable to infestation/ attack by the wax moths include, but are not limited to the following:

1. Weak colonies: this may be due to a colony with few workers, starved colonies, diseased colonies, queen-less colonies, and pesticide poisoning.

2. Favourable environment: these pests do quite well in low-altitude areas compared with mountainous high-altitude areas. Insects generally are not good at maintaining their own internal temperatures.

Signs and symptoms of infestations

The following give an indication of the presence of wax moths in a hive:

1. Presence of a white silk trail which follows the burrowing larvae moving below the cappings of honey bee brood.
2. Blackish frass (insect faeces) scattered and sometimes held by the silks/webs spun by the insect.
3. Fast moving caterpillars along a burrow lane.
4. Presence of white cocoons on hive walls and crevices.
5. Webbing in cobs.

Tunelling and webbing in combs by the caterpillars while feeding. Photo courtesy of Dr Beatrice Nganso

Spinning and cocooning by the fully grown caterpillar on various hive areas. Photo courtesy of Dr Beatrice Nganso

Prevention and control

- Maintain healthy and strong colonies, which are capable of defending themselves in the hive against wax moth infestations.
- Removing excess or empty wax combs from the colonies is highly recommended. Beekeepers should add the wax combs progressively as the bee population increases inside the colonies.
- Avoid leaving unused wax combs or unoccupied colonies with wax combs hanging around in the apiary, as they are potential breeding sites for the wax moths. This equipment should be kept always in an air-tied container or storage room.
- Regularly remove the debris that accumulates on the bottom boards of all colonies, as they are a good food source for the wax moth larvae. Beekeepers should inspect periodically weak, diseased or queen-less colonies for signs of wax moth infestation and ensure that bees occupy all wax combs in such colonies.
- In case of low infestations, the affected colonies and combs should be cleaned thoroughly with a hive tool to remove the wax moth larvae. Heavily-infested combs can be burned.
- We encourage frequent inspection to ensure early detection and removal of any infestations that may be found.
- Use of moth trap: this is explained below:

Wax moth control using locally made traps

A simple trap is used to attract and kill the moths, and sometime the hive beetles.

The trapping system is comprised of

1. **Bottle trap** which holds the attractant.
    a. The bottle can be of any form and doesn't need to be new but rather recycled.
    b. The common drinking water/juice drink/cola drinks bottles in the market are sufficient or the common soap containers
    c. A 2-liter bottle is recommended so as to have enough space for keeping the trapped pests
    d. The bottle is cut open (about 1-inch-wide hole) just near the top to allow moth and beetles inside to the attractants
    e. Have a string or wire to hold the trap on to the branch
    f. A clear bottle is preferred for easy monitoring of performance
2. **Attractants**: apparently, the moths and beetles are more attracted to the fermenting materials. As such an effective concoction has been developed to place inside the bottle
    a. A ripe banana peel
    b. Yeast (used in the normal cookery) or vinegar or cider vinegar
    c. Sugar
    d. Water

How it works

- Prepare the trap container based on the amount of liquid you may wish to place.
- Insert water, yeast (or vinegar/vinegar cider) and sugar at the ratio of 1:1:1 (i.e. equal measure)
- Add the banana peel to the mixture. No need to chop it to small pieces
- Place the trap on the apiary. It will start to attract the pests upon starting fermentation

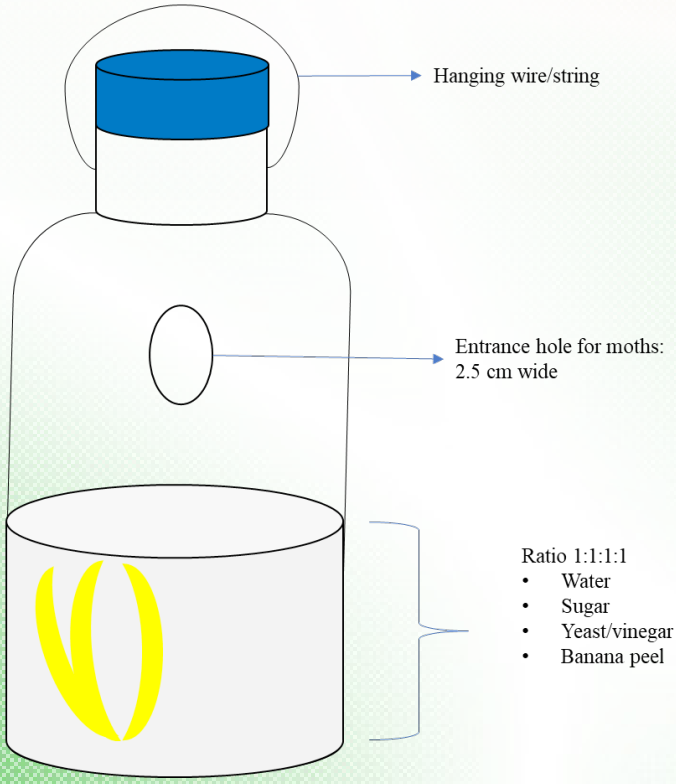
- 1 bottle per tree with several hives
- Place the trap slightly above the hive height.

Replacement and disposal

- The trap content can be replaced if it fills up with the moths and other insects. The idea is to keep checking and when filled up (above the content), then empty it
- The content can be replaced and you reuse the trap as long as it is not defaced. Change the whole trap if it becomes defaced and difficult to observe

Plastics can be harmful to environment due to long delay before degradation. Therefore, it is better to dispose by burning the trap bottle. The rest of the contents are organic

2- Litre container Moth/Hive beetle trap



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