



MANAGEMENT OF HIVE BEETLES INFESTING BEE COLONIES IN KENYA



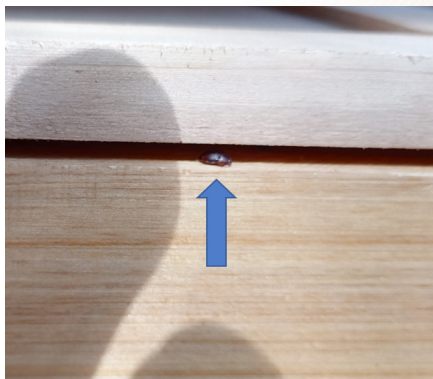


**MANAGEMENT OF HIVE BEETLES
INFESTING BEE COLONIES
IN KENYA**



Introduction

Honey bee colonies are invaded by two types of beetles; the small hive beetle (*Aethina tumida*) and large hive beetles (*Oplostomus fuliginosus*). Small hive beetle is a common pest of honey bee colonies. It is destructive, causing damage to comb, stored honey and pollen. If beetle infestation is sufficiently heavy, they may cause bees to abandon their hive. Beetle maggots may tunnel through combs of honey, feeding and defecating, causing discoloration and fermentation of the honey. In highly infested colonies where larval feeding is extensive, bees generally abscond.



Small hive beetle adult found during hive inspection. Note the smallness of the beetle. Source: Muo Kasina

Description

Adult small hive beetles are 5-7 mm (1/4") in length, oblong or oval in shape, tan to reddish brown, dark brown or black in colour, and covered in fine hairs. The size and appearance can be highly variable within a population. The large hive beetles are about 20–23 mm long with a shining black body.

The adults are usually observed in the hive with their heads tucked down beneath the thorax, so that antennae and legs are often not apparent. Honey bees are not able to efficiently remove adult beetles from the hive, and their hard shells resist stinging. The maggots of this beetle live in pollen and honeycombs. The adult maggots leave the hive to pupate in the earth in front of the apiary. The period of development from egg to adult beetle is at least four to five weeks.



Large hive beetles at the hive entrance (left) and rooming in honey comb (right). Source: Beatrice Nganso

Economic importance

Economic damage from hive beetles occurs when the bee population is insufficient to protect the honeycombs from the scavenging beetle maggots. When adult beetles first invade a colony, they may go unnoticed until their populations increase through reproduction or immigration. Both adult and maggots prey upon honey bee eggs and brood. When large numbers of beetle eggs hatch in weak colonies, the combs of honey can become “wormy” and take on a glistening, slimy appearance. Unlike wax moths, these beetle maggots do not necessarily damage the combs themselves and do not produce extensive webbing.

When large numbers of adult beetles defecate in the honey, they introduce yeasts, causing the honey to ferment and run out of the cells. In this case, the queen bee may cease egg laying, and the entire colony may abscond. Honey contaminated by hive beetles is rejected by bees, is entirely unfit for human consumption, and should never be bottled or mixed with other honey for packaging.

Pre-disposing factors

- Weak colonies are particularly vulnerable to attack, but even strong colonies can be overwhelmed by large populations of beetles.
- Nucleus colonies used for queen production or colony splits can be especially vulnerable to beetle attacks.
- If honey is harvested but not immediately extracted, beetles can invade the honey comb and quickly ruin a large portion of a honey harvest.
- Wet cappings from recently extracted honey are also extremely attractive and vulnerable to beetle infestation.

Detection

- Beetles are easily detected by visual inspection of colonies.
- When a hive is opened, adult beetles may be observed running across the underside of the outer cover, on either side of the inner cover, and the top bars of frames.
- Also, beetles may be seen running across the surfaces of combs.
- To detect beetles in the top hive body, open the hive and place the outer cover on the ground in a sunny spot, and place the top hive body into the cover
- Conduct normal colony inspection activities on the rest of the hive.
- If present in the top super, adult beetles will retreat from the sunlight, and after about 10 minutes you may lift the hive body and look for beetles in the cover.
- Beetles in the lower hive body will similarly retreat to the bottom board as the colony is disturbed.



*Small hive beetle adults rooming around comb (left) and maggots (right).
Source: J Kilonzo*

Prevention and Control

A combination of cultural and mechanical controls will usually help to maintain beetle infestations within manageable levels.

- Keep bee colonies healthy and strong. Reduce stresses from diseases, mite parasitism, and other factors.
- Maintain colonies with hygienic traits that are better able to detect and remove pests and infected brood. Eliminate, requeen, or strengthen weak colonies.
- Making splits from heavily infested hives can cause a serious outbreak if insufficient numbers of bees remain to protect the hive.
- Avoid over-supering hives, which increases the area that the bees must patrol. Maintain a clean apiary and honey house to reduce attraction to beetles.
- Pollen traps should not be left on heavily infested hives for extended periods. The unprotected pollen can serve as a substantial protein source for beetles, as well as a protected breeding site.
- Use mechanical traps in the hive to reduce the number of adult beetles that can produce eggs.



Small hive beetle maggots infesting brood combs. Source: Beatrice Nganso

There is a trap that can work for both hive beetles (especially the large hive beetles) and wax moths as described below:

Hive beetle control using locally made traps

A simple trap is used to attract and kill the hive beetles and also wax moths.

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. The common drinking water/juice drink/cola drinks bottles in the market are sufficient or the common soap containers
 - b. A 2-litre bottle is recommended to have enough space for keeping the trapped pests
 - c. The bottle is cut open (about 1-inch-wide hole) just near the top to allow moth and beetles inside to the attractants
 - d. Have a string or wire to hold the trap onto the branch
 - e. A clear bottle is preferred for easy monitoring of performance
2. **Attractants:** 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.
- Add water, yeast (or vinegar/vinegar cider) and sugar in 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.

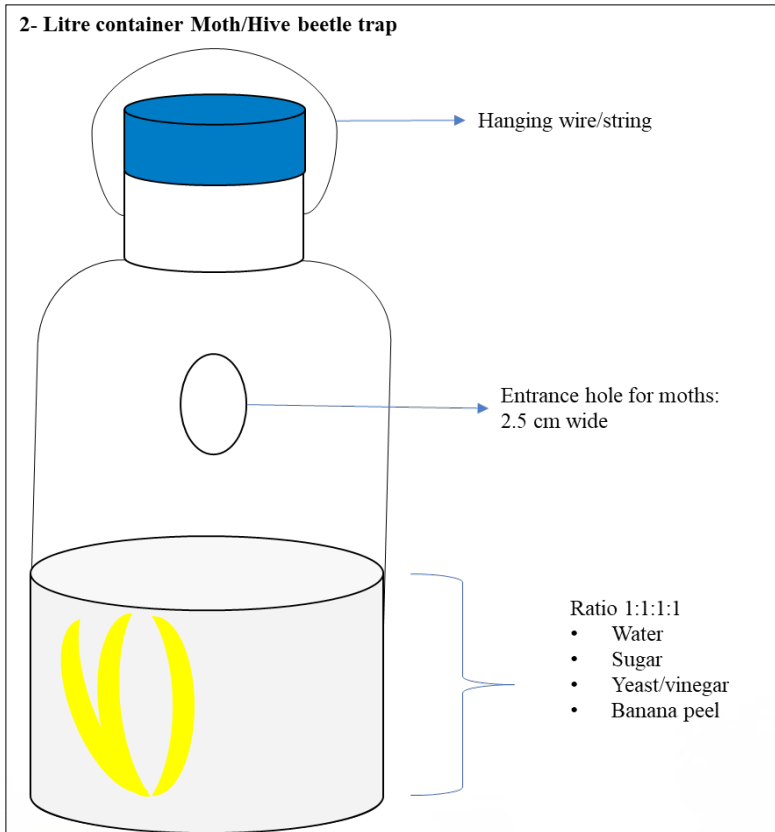
Replacement and disposal

- The trap content can be replaced if it fills-up with the beetles, moths and other insects. The idea is to keep checking and empty it when filled up (above the content),
- 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 degradation period. Therefore, it is better to dispose by burning the trap bottle. The rest of the contents are organic



Large hive beetles on a honey comb (Taita Hills, Kenya). Source: J Kilonzo



2-Litre container Moth/Hive beetle trap. Illustration: Muo Kasina



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