



# Traps used for Monitoring the Small Hive Beetle in New Brunswick Honey Bee Colonies

## *Introduction*

The small hive beetle (SHB), *Aethina tumida* Murray, is an invasive honey bee pest capable of damaging and stressing colonies, in addition to causing honey spoilage. The SHB is considered to be a minor to moderate pest that can be managed through monitoring and best management practices.

Each year since 2017, the SHB has been reported at low levels in New Brunswick (NB) honey bee colonies. The low level of SHB infestations reported to date have been localized and the SHB has survived the winter in NB honey bee colonies in some instances. The purpose of this fact sheet is to demonstrate the necessity of monitoring for the SHB with traps to eliminate or help eliminate SHB infestations and to prevent the spread of the SHB in NB. Traps are an additional tool to detect the SHB in an apiary. They are also useful in lowering SHB populations which should also help in decreasing the spread of the SHB.

NB beekeepers should also be aware that suspected SHB adults and larvae must be reported to the Provincial Apiarist. Confirmed identifications of the SHB must be reported to the Canadian Food Inspection Agency by the Provincial Apiarist.

## *Monitoring methods:*

The following traps were used to monitor the SHB. The following options were tested by the Department of Agriculture, Aquaculture, and Fisheries (DAAF) from 2017 to 2020 and proven to be effective: (A) Cloth trap (Beetle Bee-Gone) on top bars, (B) drowning trap (Better Beetle Blaster™ or the Beetle Jail) on top bars and (C) drowning trap with pollen patty attractant.

## Method A: Cloth trap on top bars

- **Trap:** Beetle Bee-Gone cloth trap (12 X 15 cm).
- **Placement:** Place the cloth trap on the top bars of the brood chamber in the corner away from the center, where the SHB tends to hide from honey bees. Place the edges of the cloth over the inner edge of the hive to keep it in place (Figure 1).
- **How the trap works:** The bees chew the cloth to try to remove it. This causes strands to become loose which makes the cloth appear fuzzy (Figure 2). The SHB adults become entangled in the loose strands and die. The cloth gradually becomes less effective as the loose strands get chewed off.
- **Inspection:** Inspect the condition of the cloth and for the presence of SHB adults every five to seven days. Replace the cloth after two weeks, or as needed, if the cloth becomes disintegrated or when the cloth becomes too disintegrated to trap beetles.
- **Sample collection:** Place the cloth with SHB in an airtight plastic bag. Place this in another airtight plastic bag with a label in between the bags. The label should have the following information: the date the cloth was placed on the top bars, the date it was removed, the name of the collector, location and the colony number. Freeze the sample for 24 hours and send for identification to your nearest NB Department of Agriculture, Aquaculture and Fisheries office and label the package "Attention: Provincial Apiarist".
- **Notes:** There is a slight chance (0.15%) (New Brunswick data) of trapping a queen honey bee. The risk can be lessened by placing the cloth trap in the corner, as previously mentioned. It is recommended to purchase cloths sold for trapping the SHB from a beekeeping supplier.



Figure 1. Beetle Bee-Gone cloth trap placed on the top bars of a brood chamber in the corner and over the inner edge of the hive.



Figure 2. Honey bees chewing a Beetle Bee-Gone cloth trap, making strands loose.

### ***Method B: Drowning trap on top bars***

- **Trap:** Better Beetle Blaster trap [22.5 cm long] (Figure 3) or Beetle Jail [17.5 cm long] trap (Figure 4). One or two traps may be used, depending upon the beekeeper's preference.
- **Placement:** Place one or two traps between the tops of the outermost frames. The SHB tends to remain in the corners to escape honey bees. A trap may be placed near the outer edge or in a corner, based upon the beekeeper's preference. If two traps are used, they should preferably be placed far apart from each other to cover a wider area.
- **Trap preparation:** Ensure the hive is leveled before adding liquid to the trap. Use food grade vegetable oil such as corn oil or sunflower oil or oil sold by beekeeping supply stores sold specifically for trapping the SHB. Apple cider vinegar may also be used but the trap will have to be inspected more frequently than a trap with oil due to evaporation. Fill one third of the compartment of the Better Beetle Blaster trap or one third of the outer two compartments of the Beetle Jail trap. A ripe piece of Bartlett pear may be placed in the centre compartment of the Beetle Jail trap to attract SHB adults. The ripe piece of Bartlett pear has a chemical which attracts the SHB. Other fruit may be used because the SHB are scavengers of rotting fruit.
- **How the trap works:** The SHB walks to escape from honey bees and falls into the trap opening and drowns (Figure 5). The trap opening is too small for a honey bee.

- **Inspection:** Inspect the trap weekly for the presence of SHB. Slowly remove the hive cover in case the cover has been stuck to the trap with propolis.
  - If using the Better Beetle Blaster trap: slowly drag a hive tool over the trap to squash any SHB which may be hiding under the edge of the trap before removing it.
- **Sample collection:** Place the trap with SHB in an airtight plastic bag. Place this in another airtight plastic bag with a label between the bags. The label should have the following information: the date the cloth was installed, the date it was removed, the name of the collector, the location and the colony number. Freeze the sample for 24 hours and send it for identification to your nearest NB Department of Agriculture, Aquaculture and Fisheries office and label the package “Attention: Provincial Apiarist”.
- **Notes:**

The Better Beetle Blaster trap is less expensive compared to the Beetle Jail trap, but it has to be destroyed to remove the suspected SHB for identification. The Better Beetle Blaster trap is designed to be disposable.

Both traps may infrequently trap miscellaneous species of beetles which are incidental and are not honey bee pests. This stresses the importance of submitting suspected SHB specimens to be identified.

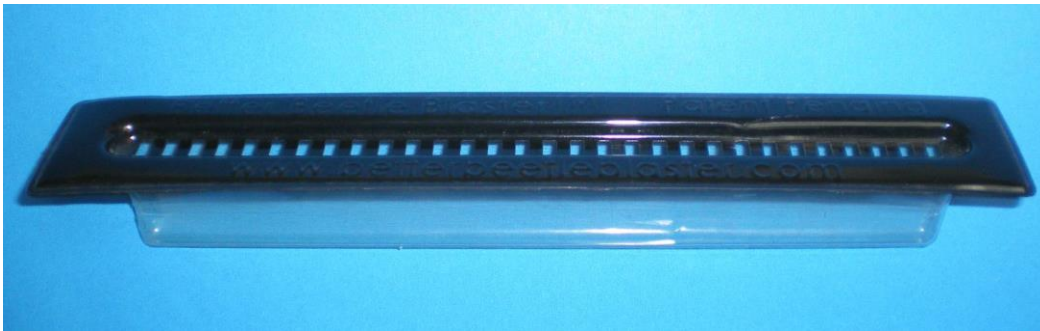


Figure 3. Drowning trap: Better Beetle Blaster trap.



Figure 4. Drowning trap: Beetle Jail trap.

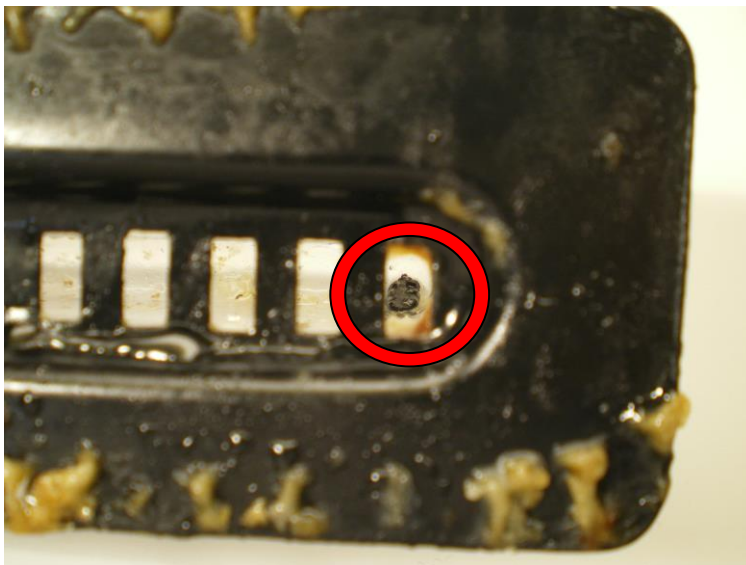


Figure 5. **Top view.** An adult small hive beetle [5 to 7 mm long] (inside the red circle) in a Better Beetle Blaster trap after the liquid has been removed from the trap. Although the photo is enlarged, the SHB is in the background and, therefore, appears approximately life size (5 to 7 mm long).

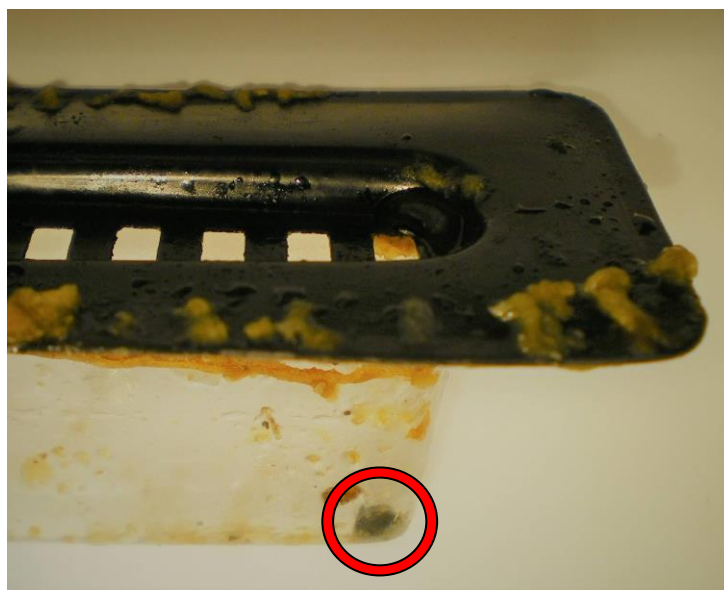


Figure 6. **Side view.** An adult small hive beetle (inside the red circle) in a Better Beetle Blaster trap after the liquid has been removed from the trap.

## ***Method C: Pollen patty attractant with drowning trap on top bars***

- **Attractant:** Pollen patty.
- **Placement:** Place the pollen patty on the top bars, preferably in a corner as this is where the SHB tend to hide. Place the SHB drowning trap next to the pollen patty with the long side of the trap next to the pollen patty to increase the likelihood of the adult SHB going into the trap.
- **How the attractant works:**
  - **SHB egg-laying activity:** The pollen patty will attract adult SHB to lay eggs on it. SHB larvae on the underside of the patty tend to crawl and hide between the pollen patty and the top of the frame (Figure 6). The presence of suspected SHB larvae indicates that an adult female SHB is (or was) most likely present in the colony. The patty will, in relatively very a few instances, attract other species of scavenging beetles which are not honey bee pests and some of these other species have larvae that are undistinguishable from SHB larvae.
  - **Hiding place for adult SHB:** The pollen patty provides a convenient area for the adult SHB to hide from honey bees between the top of the patty and the inner cover. This may make it more likely to find a SHB when inspecting.
- **Inspection:** Inspect the pollen patty (and the trap, if also present) for the presence of SHB weekly or at shorter intervals if the colony is strong, otherwise the pollen patty may be eaten before reinspection.
- **Sample collection:**
  - **Sample collection for SHB adults:** Place the trap with SHB in an airtight plastic bag. Place this in another airtight plastic bag with a label between the bags. The label should have the following information: the date the cloth was installed, the date it was removed, the name of the collector, the location and the colony number. Freeze the sample for 24 hours.
  - **Sample collection for larvae:** It is not always possible to identify suspected SHB larvae to species based on physical appearance. If only larvae are found, the larvae should be kept alive in an airtight container with a pollen patty and sufficient air. This is important because the larvae will need to be reared to the adult stage for identification.

Send samples for identification to your nearest NB Department of Agriculture, Aquaculture and Fisheries office and label the package “Attention: Provincial Apiarist”.

- **Notes:** Pollen patties should only be used if the person doing the monitoring removes suspected SHB larvae on a weekly basis. The pollen patty will serve as a breeding ground for the SHB and the SHB population will increase if monitoring is not conducted on a minimum weekly basis. Placing a pollen patty beside a drowning trap is more effective in trapping an adult SHB, compared to a trap without a pollen patty (NB data).



Figure 7. Small hive beetle larvae on the underside of a pollen patty (from an Ontario hive).

### Summary:

NB beekeepers are recommended to follow one of the methods described to monitor for the SHB until there are not any small hive beetles found after a few weeks. Monitoring is an important step to eliminate or help eliminate the small hive beetle and to help prevent its spread to nearby apiaries. Beekeepers should also be vigilant in inspecting their colonies for the small hive beetle in their regular beekeeping activities, especially if they have a concern that their colonies may have been infested with the small hive beetle.

**Suspected SHB specimens must be reported to the Provincial Apiarist. The SHB, *Aethina tumida*, is categorized as an immediately notifiable disease by the Canadian Food Inspection Agency.**