REPUBLIC OF KENYA

KALRO
Kenya Agricultural & Livestock Research Organization

NAVCDP
NATIONAL AGRICULTURAL VALUE CHAIN DEVELOPMENT PROJECT

MANAGEMENT OF PREDATORS OF BEE COLONIES

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A wide range of animals, both large and small, are predators of honey bee colonies. The most significant tropical predators include the ants, wasps and honey badger. However, amphibians, reptiles, birds and mammals also utilize bees as essential food. The methods of control vary with the type of predators

1. How to manage Honey badgers

These are serious predators of bee colonies in East Africa. They destroy bee hives, honey and brood combs as they search for honey. In the process, they disturb honey bee colonies, which may lead to absconding.

Honey badger (Mellivora capensis) photo courtesy of Jonah Kinyanjui

The following strategies can be used to manage this predator:

i) Swinging wire for honey badger prevention

A honey badger requires solid ground or firm surface to anchor on, as it pulls the hive apart. Hanging hives by flexible swinging wire prevents

honey badgers from accessing the hives. The wire holds the hive at a height of about 4 feet from the ground level. The hive swings when the honey badger tries to hold it, making the badger to lose grip whenever it tries to hold the hive. The wire should be strong enough to hold the weight of the hive.

Hives held in position by flexible wire (Source: J. Kinyanjui)

Hives held in position by flexible wire (Source: M Kasina)

ii) Hive stand against honey badger

This is a metallic pole, anchored to the ground, with a support base that holds the hive off the ground, at a height of about 4 feet. Hive can be fastened to the support base by a flexible wire. The honey badger is incapable of climbing up the stand and thus cannot reach the hive.

Hive stand hold the KTBH (Source: M Kipkirui and J Mutai)

iii) Use of guard sheets

Iron sheets are placed around the base of a tree where the bee hives are hanged (apiary). The iron sheets act as a barrier/guard and prevent honey badgers from climbing the tree hence limited access to the hives. The guard sheets can also be used where wooden poles are used as hive stands. The honey badger will slide off when it trys to climb up the sheets.

Honey badger guard sheet (Source: M Kasina)

2. Management of Wasps

Description

The species of wasps which attack bees include *Vespa orientalis* (yellow wasp), *Vespa auraia* (golden wasp) and Vespa magnifica (black wasp). They are black with defined yellow or white markings on their bodies. They are approximately ½ inch long and have narrow bodies with a pinched waist. They are more angular than honey bees, and they lack the dense body hairs and furry appearance of bees.

Wasps are semi-social, colony-nesting insects. A queen emerges and selects a nest site. Depending on the species, a nest site may be an underground cavity, a hole or opening in a structure, or an aerial nest. The queen (or often multiple queens) will build a small nest in the cavity and begins laying eggs which become the first generation of workers. Initially, the queen builds the nest, feeds larvae, and forages. Once the first generation of workers emerges, the queen will remain in the nest, laying eggs.

Black wasp Vespa magnifica (Source: Dreamstime)

Wasps acquire protein from animal sources through scavenging and predating on other insects. Carbohydrate sources include plant nectar, fruits, or honeydew (the sugary secretion of aphids). When prey insect populations and nectar sources are reduced, wasps can rob resources from honeybee colonies and predate on adult bees.

Heavy predation can lead to a decline in bee population and overall honey bee colony health. Sustained predatory pressure can affect weak colonies more and may ultimately lead to colony death.

Vespa orientalis fanning the colonies (Source: Wikimedia)

Vespas orientalis (Source: Adobe Stock)

The following strategies can be used to manage the wasps

(i) Use of Traps

Commonly available attractants for these traps may include rotting foodstuff like meat, pet food, fish, or rotting fruits. Place traps low to the ground because wasps tends to forage low and at least 20 feet away from bee hives. This prevents the wasps from discovering the bee hives when investigating the traps. Replace attractant in traps regularly throughout the season to maintain efficacy. Traps will need to be periodically emptied of dead wasps, so put them in a readily accessible location.

Avoid using sugary attractants as they could also attract bees. You may use attractant suspended over soapy water to drown wasps.

Items needed to assemble the wasp trap

- 2 litre plastic bottle
- A piece of bait (attractant)1/2 cup sugar
- 1 cup vinegar
- 1 cup water
- A few drops of liquid dish soap

Making wasp trap using a water bottle

- Cut a hole near the neck of the bottle, tie a string round the lid of the bottle alternatively draw a line with a marker around the neck of the plastic bottle (seen in the picture below).
- Cut the neck off the plastic bottle along the marked line to make a funnel;
- Grease the inside of the bottle and funnel with cooking oil to create an additional slippery barrier that the wasps will be unable to climb (optional).

- Flip the neck of the bottle upside-down, and place the neck into the bottle (seen in the picture below). The neck of the bottle will serve as a funnel for the wasps to enter, but not exit, the trap. Make sure to remove the cap before placing the neck into the bottle. This is the opening where the wasps will be entering.
- Tape the two pieces together along the cut edges using a clear tape.
- Make two holes on opposite sides of the funnel's edge.
- Tie the ends of a 12 in (30 cm) long string to each punched hole. This will create a handle so you can hang your wasp trap.
- You can use any type of string which is available.

One trap presentation

Making the trap mixture

- Put the food bait inside the bottle. In a different container stir together the sugar, water, vinegar and a few drops of dish soap. Pour the liquid over the bait.
- Hang the trap on a tree branch 3 to 10 feet off the ground.

Information on the ingredients

- Bait: Any food left overs or fruits including stale foods will do.
- Sugar: use granulated white sugar.
- Vinegar: in its absence, use a quarter teaspoon of yeast which ferments the sugar and gives the acetic acid odor of rotting fruit.
- Water: this is for drowning the wasp. Once wet, the wasps are unable to fly out.
- Soap: soap breaks the surface tension of the water, allowing the water to be quickly absorbed by the wasps so they drown faster.
- The bait mixture can use any of the two bottle designs.

2nd trap presentation

Other methods of managing wasps

- Beekeepers can protect their honey bees from wasp predation with good beekeeping practices such as keeping strong colonies, reducing hive entrances, installing robbing screens, and maintaining a tidy apiary.

How to keep strong honeybee colonies,

Strong colonies will have many guard bees to fend off wasps.

- Keep colonies strong by keeping Varroa mite levels and other pests and diseases under control.
- Ensure that honey bee colonies have ample forage resources. Feed bees carbohydrate (sugar syrup) and protein (protein patties) when necessary, while taking care to clean up any spilled syrup or patty remnants. Feeding bees in Kenya should be the last resort.
- Apiary and colony management are generally the most effective methods of keeping honey bees safe from wasps predation.
- Woodenware should be maintained in a good state with no gaps between boxes. Entrance reducers minimize the space guard bees need to defend. If you need to reduce entrances and temperatures are high, use mesh screens that prevent intrusion but allow for adequate ventilation. Robbing screens allow resident honey bees to enter and exit the colony, while deterring wasps from entering.

A robbing screen (Source: KALRO ABIRI team)

3. Management of Ants

The species of ants, *Conponotus compressus* (carpenter ant), *Dorglus labiatus* (red ant), *Monomorium* and *Solenopsis* spp (fire ant), invade honeybee colonies. Ants invade the hive to eat honey, kill and carry away bee eggs, larvae and pollen. They lay their eggs in the hive and desanitize the hive with the frass. As a result of their invasion, the bees abscond.

Methods of managing ants

i. Maintain strong bee colonies

ii. Place the hives on stands with their "legs" in earthen cups containing water. Since bees mostly drink from it, the water should be clean.

Bee hive stand on soapy water (Source: Beekeeping basics)

iii. The hive stand may be painted with used engine oil or wrapped with tape soaked in corrosive sublimate to serve as a good repellent for ants. This needs renewing once or twice a month.

iv. A newly installed bee-hive should be visited frequently to check the invasion of ants.

Safari ants colony

Absconded hive due to ants invasion (Source: Irene Onyango)

4. Management of other predators (birds, mammals and reptiles)

i. Predator cause losses in honey production and absconding of bees.

ii. Predators also eat bees, thereby reducing their population.

iii. Predation by lizards, snakes, birds can be reduced in bee colonies by eliminating a landing bay from the hive, since some predators wait for the bees at the entrance. The absence of a landing bay will allow the bees to come directly to the hive entrance to get in.

iv. Greasing or pasting a sticky substance on various hive space especially where predators are seen landing can discourage them from landing.

v. Further, removal/destruction of the bird nests near apiaries will reduce massive predation.

vi. Place hives on stands from 40 to 60 cm high as a protective measure.

vii. Coat the stands with used engine oil or grease to deter reptiles from climbing up to the hive entrance.

viii. A well-kept bee apiary that is frequently mowed, without dense bushes, shrubs and tall grass, that can provide safe hiding places to the predators, has less chance of suffering losses from reptiles than one that is not attended to.

ix. Prevent bird predation through careful site selection and by temporary relocation of the apiaries.

x. Methods of controlling monkeys and baboon may include:

- Wiring lids to hives
- Suspension of the colonies for small-scale beekeepers.
- Install baited fence around the apiary, and
- Keep the fence clear of vegetation, or relocate colonies to a different site.

5. Mice, rats and skunks (rodents)

Rodents make their nests in hives and destroy combs or build nests in corners away from the bee cluster as they do not like to be stung. Their activity may disturb the bees, but their nest building causes the greater damage to combs and equipment. They chew the combs, eat pollen, and build nests among the combs. They also urinate on combs and frames, making bees to abscond.

To control them,

a. Reduce hive entrances.

b. Seal any openings on the hive.

c. Put rat bait within the apiary in bait boxes or under the hives.

Skunk (Source: Accurate Pest Control)

Rat (Source: Accurate Pest Control)

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