



SMALL HIVE BEETLE

(*Aethina tumida*)

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The small hive beetle, our newest bee pest, was first identified in Florida in the spring of 1998. Before its discovery in the U.S., the beetle was known to exist only in tropical or subtropical areas of Africa. How it found its way to North America is not certain. Since adults will feed on fruit and are especially fond of cantaloupe, the beetles may have been accidentally introduced into this country via a shipment of fruit originating from Africa.

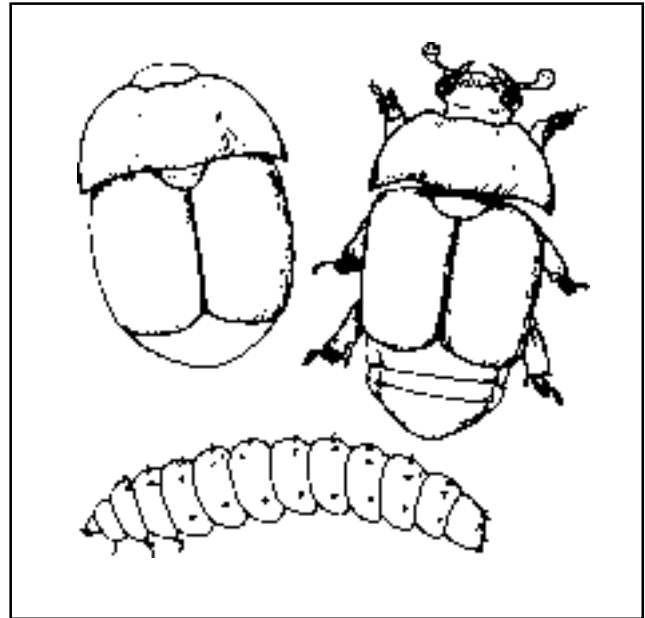
While the small hive beetle is not considered a serious pest in South Africa, some Florida beekeepers experiencing heavy infestations have seen the quick collapse of strong colonies. As of February 1999, the beetle has been found in apiaries in Florida, Georgia, and North and South Carolina. They were also found in supers of honey sent north from Florida, but were destroyed. So far, the areas where it has successfully established itself appear to be restricted to regions along the East Coast of the U.S. This is probably due to the sandy soil conditions in these areas which allow the beetle to successfully complete its life cycle. To date, beetle infested colonies in Georgia, not located on sandy soil, have not reached damaging levels.

DESCRIPTION

The adult beetle is small (about 1/3 the size of a bee), reddish brown or black in color and covered with fine hair. The larvae are small, cream colored and similar in appearance to young wax moth larvae. You can differentiate the beetle larvae from wax moth larvae by examining their legs. Beetle larvae have three sets of legs just behind the head. Wax moth larvae, like all moth and butterfly larvae, have three sets of legs behind the head but in addition have a series of paired prolegs which run the length of the body. Prolegs are absent in beetle larvae.

LIFE CYCLE

Adult females lay their large egg masses on or near beeswax combs. In South Africa the eggs hatch in a few days, producing a great number of small larvae. The larvae consume pollen and wax but also will eat honey, bee eggs and larvae. They complete their larval stage in 10 to 16 days and then drop to the ground where they pupate in the soil. Adults emerge from the soil in approximately 3-4 weeks. The females are capable of laying eggs approximately one week after emerging from the soil. They are good flyers and easily disperse to new colonies where they deposit eggs to begin a



new generation. Close observation of beetle infested colonies in Georgia has shown that the beetles completely shut down reproduction during winter.

DAMAGE

While this beetle is considered a minor pest in South Africa, the U.S. experience to date would suggest that it has the potential to be a pest of significant economic importance, in at least some areas. Whether or not it can successfully establish itself in temperate regions or in areas without sandy soil is not yet known. This information will be key to determining its importance as a pest in the northeast.

In North America, beetles appear to be able to readily take over even strong colonies with little resistance by the bees. A few beetles can produce masses of larvae. In addition to consuming the resources of the colony, according to a study by Dr. A. E. Lundie (Union of South Africa, Science Bulletin 220, 1940, 30 pp.), the adult beetles defecate in the honey causing it to ferment and run out of the combs. Full honey supers stored in the honey house or on hives above bee escapes, and weak hives with honey but few bees, seem most vulnerable to attack. When small hive beetle infestations are heavy, even in strong colonies, queens will stop laying eggs and the bees may abscond.

DETECTION

All hive inspections should be done with an eye open for this pest. When opening a hive containing beetles, they can be seen running across the combs to find hiding places. Adults may also be detected under top covers or on bottom boards. If an infestation is heavy, both adults and masses of larvae may be seen on the combs and bottom board. These larvae do not produce silken tunnels, webbing or cocoons in the hive (as wax moth larvae do).

According to the Entomology Insect Information Series pamphlet, "Small Hive Beetle" prepared by Mike Hood (Clemson University), varroa mite sticky boards are ineffective for use in detecting adult beetles. The beetles move easily across the sticky material even if the boards are coated with a stickier material such as Tangle Foot®. However, corrugated cardboard with the paper removed from one side, placed on the bottom board at the rear of the hive, has been successfully used in detecting adult beetles. The beetles appear to seek shelter in the corrugations. Plastic corrugated "cardboard" is preferred since the bees will chew up regular cardboard.

Package bees and nucs - Migratory colonies returning from beetle-infested regions in southern states, and nucs and packages produced in and shipped from these areas are at a higher risk of being infested with beetles. We suggest that beekeepers purchasing bees from these areas require that nuc/package bee producers treat parent colonies with Coumaphos before nucs and packages are made up. If you suspect small hive beetle infestation or would simply like to have colonies inspected for the presence of these beetles and/or other problems, you should contact your state apiary inspection service.

Fermented honey exuding from full supers in storage, waiting to be extracted, or on active colonies, is a sign that hive beetles may be present. A "decaying orange" odor may be given off by the fermented honey.

CONTROL

If you find evidence of, or are concerned about the possibility of a hive beetle infestation, you are urged to immediately contact your state apiary inspector (Department of Agriculture). Most mid-Atlantic states have recently received a section 18 (emergency use) registration for the chemical coumaphos, in the form of CheckMite+ Strips, to control this pest. However, beekeepers are strongly urged to take drastic measures to slow the spread of the pest. These measures may include freezing or burning the infested hive and bees. Freezing at 10° F for 24 hours, is reported to kill all life stages of the beetle.

To reduce the threat of this pest in your apiary(ies), it is highly recommended that you take the following precautions:

- maintain only strong, healthy colonies
- keep apiaries clean of **ALL** equipment not in use
- extract honey as soon as it is removed from colonies
- destroy these beetles as soon as they are detected

HIVE TREATMENT

The section 18 registration for CheckMite+ Strips is for non-food use. There is no allowance for any coumaphos residue in honey or wax. All surplus honey supers must be removed before treatment and not be replaced until after the treatment has been removed. Coumaphos is in a group of highly toxic materials called organophosphates. The dermal (absorption through the skin) toxicity of coumaphos to mammals is much greater than that of Apistan. It is therefore imperative that beekeepers follow all label instructions, including wearing gloves, when using CheckMite+ Strips. Use either rubber dishwashing gloves or chemical resistant gloves; cloth bee gloves are not recommended.

With all the treatments necessary to keep bees alive over the past several years, many beekeepers have developed a very casual attitude toward the use of chemicals in beehives. Many consider that if it doesn't kill the bees, it can't hurt me. Coumaphos is not a material to be handled casually: misuse of CheckMite+ Strips can lead to serious consequences.

READ AND FOLLOW THE LABEL DIRECTIONS WHEN USING THIS OR ANY PESTICIDE.

- Wear rubber dishwashing gloves when handling the strips.
- Remove honey supers before application of CheckMite+ and do not replace supers until 14 days after the strips are removed.
- Remove the paper from one side of a 6- by 6-inch piece of corrugated cardboard. Cut the CheckMite+ strip in half and staple both pieces to the corrugated side of the cardboard. Place the cardboard in the center of the bottom board with the strips facing down.
- The treatment should remain on the colony for at least 3 days, but no more than 45 days.
- Do not treat for small hive beetles more than four times per year.
- Sale of **comb** honey from hives treated with coumaphos is prohibited.

The section 18 registration for coumaphos is temporary. Bayer will continue to work toward a section 3 (general use) registration for their bee strips. In the meantime, EPA through state pesticide agencies, will monitor the use of CheckMite+ Strips. **If any misuse of the product is documented or any residues are found in honey, chances for continued use of the product will be jeopardized.** If general use registration can be obtained for coumaphos, we would urge all beekeepers to stop using Apistan for 2 to 3 years, hoping that Apistan may regain its effectiveness. After this, the two treatments

could be used alternately which could extend the effective life of both chemicals.

CheckMite+ Strips provide control of the small hive beetle when used according to the label instructions. For more detailed information on the use of coumaphos for beetles and varroa mite control, please see the pamphlet "Recommendations for the use of Coumaphos." This can be obtained from your Department of Agriculture or Cooperative Extension Service. Under the section 18 registration, strict records must be kept on the sale of these strips to each state. Mann Lake Ltd. has an exclusive with Bayer to purchase and distribute the CheckMite+ strips. However, the strips can be purchased directly from Mann Lake or from one of their many authorized dealers that choose to carry the product. For the names/addresses/phone numbers of authorized dealers that carry CheckMite+ strips near you contact Mann Lake Ltd, 501 South First Street, Hackensack, MN 56452-2001, orders 1-800-233-6663, office 218-675-6688.

SOIL DRENCH

Y-Tex Gardstar® 40% EC Livestock and Premise Insecticide (permethrin—see note below) has been approved in controlling the small hive beetle around honey bee colonies. Hive beetles must pupate in the soil to complete their life cycle. This pesticide, used as a soil drench, provides treatment for the beetles, while minimizing contact with bees and honey.

For treatment of existing infestations, apply as soon as beetles or larvae are observed in or around the hive. Thoroughly wet ground in an area 18-24 inches wide in front of each hive (1 gallon per 6 hives). Apply in late evening after bees become inactive. For pre-placement treatment of apiary, apply to entire ground surface 24-48 hours prior to hive placement.

Note: Permethrin is highly toxic to bees and extreme caution must be taken to avoid contact by spray or spray drift with the bees, hive equipment, or any other surfaces that bees may contact. When hives are present, application of the pesticide may only be made with a sprinkler can. Hand pump sprayers may only be used when hives are not present and only for pre-placement treatment of an apiary. Do not contaminate any water or food source that may be in the area or apply during windy conditions. For better soil penetration and improved efficacy, cut grass around hive prior to application.

WARNING

Pesticides are poisonous. Read and follow directions and safety precautions on labels. Handle carefully and store in original labeled containers out of the reach of children, pets, and livestock. Dispose of empty containers right away, in a safe manner and place. Do not contaminate forage, streams, or ponds.

For more information, please visit the Mid-Atlantic Apiculture Research and Extension Consortium website
MAAREC.cas.psu.edu.

or

APIS website

<http://www.ifas.ufl.edu/~mts/apishtm/apis98/apjul98.HTM>

or

Florida State Collection of Arthropods at

<http://www.ifas.ufl.edu/~entweb/aethina.html>

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Participants in MAAREC also include state beekeeper associations, and State Departments of Agriculture from Delaware, Maryland, New Jersey, Pennsylvania and West Virginia.

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