

Introduction and Background

The Ohio Department of Agriculture began a series of steps in April of 1999 to stop a virulent new tropical pest, the small hive beetle, or SHB, from destroying honeybee colonies in Ohio. The insect, *Aethina tumida*, originated in South Africa. After the first hive infestations in the U.S. were confirmed in Florida in June of 1998, the beetle also invaded Georgia, South Carolina, and North Carolina the same year. The beetle has the ability to destroy a bee colony within a matter of weeks.

Introduced into Ohio: Their presence was confirmed in Ohio on April 23, 1999 in package bees transported in mid-April to several Ohio beekeepers from an apiary in South Carolina. Beetle infestations also were reported in early 1999 in Pennsylvania, New York, Minnesota, Maine, and New Jersey.

Importance of control: In pollinating fruit and vegetable crops such as apples, cucumbers, and pumpkins,

bees may add as much as \$225 million a year to Ohio's economy. ODA's actions have included mounting an intensive hive inspection and beekeeper awareness program, helping get shipments from infested apiaries stopped, and obtaining an emergency exemption from USEPA allowing Ohio beekeepers to employ CheckMite+, a pest control strip containing the insecticide coumaphos, to combat the beetles. The strips are part of an integrated pest management approach described in this bulletin, along with other information to help beekeepers prevent or halt an SHB invasion of their hives.

More detailed information on the small hive beetle, such as downloadable photographs of beetle adults and larvae, as well as non-pesticide soil treatments that may be used to kill the beetles when they are pupating in the soil outside the hive, may be found on the World Wide Web at <http://www.state.oh.us/agr/>.

For more information on the small hive beetle threat to domestic honeybee production, please contact:

Ohio Department of Agriculture
Apiary Inspection Office
614-728-6373
614-728-4235 (fax)
800-282-1955 (toll free within Ohio)
(Beekeepers should also call this number to report SHB infestations.)

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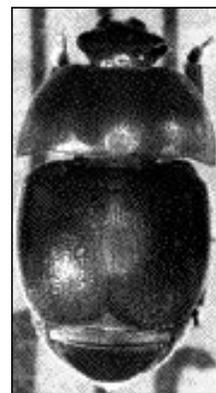


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Aethina tumida

**Small Hive Beetle:
What It Is,
How To Fight It
May 1999**

Small Hive Beetle: What It Is, How To Fight It

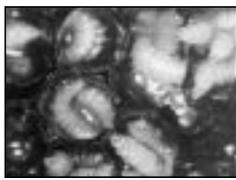
The Beetles' Destructive Life Cycle

What they look like

The adult beetle is dark brown to black and about one third the size of a worker bee. Larvae are elongated, whitish grubs that have three pairs of legs and can be mistaken for wax moth larvae. However, small hive beetle larvae do not spin cocoons and must complete their development outside the beehive in the soil. In severe infestations, larvae may be seen crawling out of hive entrances or from stored honey supers.

Egg to adult within 45 days

Beetles, like moths and bees, undergo a kind of development called "complete metamorphosis." The beetles' life cycle starts with eggs which are laid in the hive and within two to three days hatch into larvae there.



Beetle larvae will destroy honeycomb.

Ten to 16 days later, the larvae crawl from the hive and drop to the ground outside, where they burrow into the soil and pupate there. In about three to four weeks they emerge as adult beetles, and re-enter the hive a week later. This process may repeat itself several times a year, especially during the warmer months.



Larvae will grow to 10-11 mm long.

Finding the Beetle in the Hive

Call ODA: Beekeepers are urged to call ODA's Apiary Inspection of Fire toll-free at 1-800-282-1955 if they suspect their colonies are infested by the small hive beetle. Also, all beekeepers should check their colonies at least monthly – especially beekeepers who have purchased packaged bees and nucleus hives from outside Ohio.



Beetles may be found in crevices or on the bottom board

Difficult to find: Looking for small hive beetles in a colony may be difficult – the adult beetle is dark-colored, moves fast, and avoids light. Beetles are likely to be found in crevices in the hive or on the bottom board – although when temperatures

are cooler, the beetles remain with the bee cluster and do not move onto the bottom board. Many times when separating a hive consisting of two deep hive bodies, the beetle may be found along the frame rest grooves.

Honey destruction: SHB

larvae are the most objectionable to the bees because they defecate in the honey, and the resulting fermentation and odor make it unattractive to the bees. The larvae also damage wax honeycombs – especially newly drawn, delicate combs. When wax combs stand for a long period of time in the honey house, ready to be extracted, beetle larvae infestation can be most troublesome. This happens when beetles are actively reproducing in the colony.

cover, place the cover upside down on the ground, remove the deep super and place on the outer cover (2 deep super hives). If beetles are present, they will move out of the super away from the light and into the outer cover, and may be seen crawling in the cover.

How to Rid Hives of the Small Hive Beetle

Diagnose properly:

Preventive use of an insecticide in and around bee hives is not effective and is not recommended. Beekeepers should become familiar with the small hive beetle in order to properly diagnose and manage the beetle should it occur. Sound pest management begins with positive diagnosis of the pest. For verification of suspected small hive beetles, call ODA's Apiary Inspection of Fire toll-free at 1-800-282-1955.



Adult beetles are about 5-7 mm (about 1/4 inch) long.

Good hive management:

There are several colony management tools which are effective against infestations when integrated with the use of available insecticides. They are: Maintain a strong bee population in each hive. Inspect every hive at least once a month. Moving the hive will disrupt the life cycle of the beetle. Maintain close mowing or bare ground around the hive to facilitate chemical controls and provide less shelter for beetle larvae leaving the hive to pupate.

Chemical controls: A pesticide selected for application within or around a bee hive must have usage directions specifically for the control of hive beetles. To protect themselves, their bee colonies, and the honey, beekeepers must read and follow all use precautions on the pesticide label.

Pesticide treatment inside the hive: An emergency exemption has been approved by USEPA for beekeepers to use pest control strips containing the chemical coumaphos. The strips are sold in Ohio under the trade name Check Mite+.



An integrated pest management approach is recommended.

Bee Hive Pest Control Strip. The insecticide is impregnated into a plastic strip which is placed in the bottom of the hive body. There, the beetles absorb a lethal dose of insecticide when they contact the strip.

Basic precautions: CheckMite+ can also be used for control of Varroa mite, but the use directions are very different for control of hive beetle – such as when and where the chemical should be applied and how long the treatment should

last. For example, CheckMite+ strips should be placed in the hive for no more than seven days at a time when treating for the beetle. A hive should be treated with this pesticide no more than four times

per year. A hive where honey for human consumption is present should not be treated – the pesticide will make the honey unsafe to eat. Specifically, honey supers

must not be on the hive during treatment (whether for SHB or Varroa) to avoid this pesticide coming in contact with honey intended for human food. Coumaphos works better when the air temperature is over 70 degrees F. Complete use directions are listed on the product label.

Pesticide treatment outside the hive: Beekeepers will also want to exploit a vulnerable point of the beetles' life cycle, when mature larvae enter the soil near the hive to pupate. GardStar 40% EC is a concentrated formulation containing the insecticide peme-thin. This product is directed at control of hive beetle larvae – it kills the larvae when they come into contact with insecticide-treated soil near the hive.

Basic precautions: This product poses a higher risk to bees and humans than does CheckMite+. Follow these instructions: Remethrin is highly toxic to bees, so beekeepers must use extra caution when applying it

around a bee hive. If a hive is SHB-infested, here are two optional ways to approach the problem: 1. Moving a hive from one area to another and then placing it on a site where GardStar 40% EC has been

applied should reduce potential insecticide exposure to bees. 2. Dilute GardStar 40% EC in water and apply to soil in front of the hive using a sprinkling can or low-pressure sprayer – even small amounts of pesticide spilled or sprayed onto the hive can be dangerous to bees. Caution: GardStar 40% EC in concentrated form can cause irreversible eye damage if splashed in the eye. Wear face shield or safety glasses when mixing concentrate from the original container.