

# A Trap for the Small Hive Beetle

**B**ees make the agricultural world go 'round—at least the fruits and nuts part of agriculture. Crops such as apples, pumpkins, almonds, and sunflowers all depend on honey bees to pollinate their flowers. In addition to their pollination contribution, bees produce more than 17 million pounds of honey each year in Florida alone. But in recent years, pests have been reducing honey bee numbers and threatening large sectors of agriculture.

One such pest, which has appeared in the United States in the last 10 years, is the small hive beetle (*Aetina tumida*). In bee colonies already stressed by other pests or diseases, the beetles are able to evade guard bees and access the hive's pollen and other food resources.

Peter Teal, research leader of the Chemistry Research Unit at the Center for Medical, Agricultural, and Veterinary Entomology in Gainesville, Florida, and his colleagues have developed a trap and an attractant to help beekeepers protect their bees from this pest, which has spread throughout the eastern portion of the United States.

When small hive beetles invade a beehive, they bring in a yeast that grows on the pollen. "As the yeast grows and ferments, it releases compounds that mimic honey bee alarm pheromones and are highly attractive to other beetles," says Teal. "This sets off a cascading effect. When the beetle population gets too high, the bees have no choice but to abandon the hive, leaving beekeepers without honey and their bee colonies."

In cooperation with several beekeepers, the team of scientists decided to use the small hive beetle's biology against it. They developed a trap that is baited with the small hive beetle yeast. The trap is installed below a hive and separated from it by sliding doors drilled with cone-shaped holes. Hive beetles can get through the holes and into the traps, but they can't get back out.

The trap could be a boon to the bee industry in Florida, which is a common overwintering destination for bees. A patent for the trap was filed in March 2005. "We think these traps will solve the problem for small-scale beekeepers, which make up 60 percent of the industry," Teal says. "They tend their hives daily and can clean their traps often."

For large-scale beekeepers, who maintain up to several thousand hives, Teal and his team plan to develop a new trap requiring less management.

Teal also hopes to devise a similar way to reduce populations of *Varroa* mites—another significant pest of honey bees. "If we can find out what makes these pests tick, we might be able to find out how to prevent them from causing further harm to this industry," says Teal.—By **Sharon Durham**, ARS.

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Honey bee on an apple blossom.

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