

WHAT'S HAPPENING

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Merchant Grain Beetle or Sawtoothed Grain Beetle: Does the ID really matter? By Karen Vail

Merchant grain beetles (Figure 1) and sawtoothed grain beetles are both small (1/10 to 1/8 inch), flattened, brown to reddish-brown beetles that infest stored food. Both of these insects have six sawtooth-like projections on each outer edge of the thorax and distinguishing the two species is very difficult. The key to controlling stored products pests in the home is to locate the food source and remove it. Although these two pests have slightly different food preferences, they have so many food sources in common, that distinguishing these two species won't help the homeowner. However, it is important to recognize these insects as stored product pests.



1. Top view of the merchant grain beetle. Both the merchant grain beetle and the sawtoothed grain beetle are flattened, reddish-brown beetles that have six sawtoothed-like projections on the outer edges of the prothorax.

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2. Merchant grain beetle (left) and sawtoothed grain beetle (right). The area behind the merchant grain beetle's eye is shorter than one-half the vertical length of the eye. The area behind the eye is more than the one-half the vertical length in the sawtoothed grain beetle's eye.

Key ID characters. These grain beetles are small (1/10 to 1/8 inch), flattened, reddish-brown beetles. For the curious, the easiest way to distinguish these two beetles is to look at the beetles in profile. The area behind the eye is shorter than one-half the vertical length of the merchant grain beetle's eye (Figure 2). Larvae are about 1/8 inch long, yellowish-white with a darkened head. In one case that I investigated last week, both species were present.

Food preferences. Neither species will attack sound grains, but they will feed on the bits of grain that have settled in grain storage areas. Both species can be found feeding on cereals, other breakfast foods, pasta, pet food, cake mixes, flour, candy bars, and many other products including grain-based rodent baits. However, merchant grain beetles prefer seeds, nuts and dried fruits, while sawtoothed grain beetles prefer cereal-based products. The adult and larvae can feed on the food items mentioned above.

Both beetles can chew through food packaging including cardboard, plastic, cellophane and similar materials. Thus unopened food items stored in these types of containers are susceptible to beetle attack.

Control. What follows are suggestions for helping to manage infestations of these beetles.

- Find the source of the infestation and remove it. Heavily infested food should be put in a sealed bag and placed in the outdoor garbage immediately. Start with the obvious food storage areas. If you have small children or pets, then search other areas where they may have forgotten a partially eaten, possibly forbidden, cookie or similar item. Don't forget to inspect the attic, basement and other areas where artwork made with food items may be stored.
- When purchasing items that are preferred by these beetles, check that no beetles or holes in the packaging are present.

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- Ensure these packages have not exceeded their expiration date before bringing them home.
- Use older foods first - FIFO (first in, first out).
- Buy small quantities of seldom used products.
- Either store susceptible items in a refrigerator or freezer, or use insect-proof containers (glass, heavy plastic, or metal, with screw-type lids, if possible).
- Clean quickly any spills in cabinets.
- Clean food storage spaces.
- Inspect periodically the food storage spaces for pests.
- Populations can persist on crumbs left behind in cracks and crevices of the food storage areas. Use a vacuum cleaner with strong suction to remove food debris from cabinets, under appliances, furniture and other areas where food particles may remain. Scrub these areas, if appropriate, with soap and hot water. When vacuuming is completed, place disposable vacuum bag in a plastic bag, seal and place in outside garbage immediately.
- Remove old liner paper from cabinet shelves and replace with new paper.

Rodents may collect food items and leave them in wall voids or under cabinets. In this case where it would be difficult to remove the food source, a pest management professional should be hired to control the rodents and inject an insecticide into the wall and cabinet voids.

Sources:

Smith, E and R. Whitman. 1992. NPCA Field Guide to Structural Pests. First edition.

<http://www.pestworld.org>

U.S. Army Center for Health Promotion and Preventive Medicine. 2008. 18-066-0308 Stored Product Pests: Sawtoothed Grain Beetle. <http://chppm-www.apgea.army.mil/documents/bugs/SawtoothedGrainBeetleFSMar08Final.pdf>

Stored Grain

By Russ Patrick

Please aerate those bins during cool nights. This will help keep the grain inside the bins cool so insect problems won't build up as fast. Even if you treated the grain you must aerate the grain to reduce the possibility of developing any moisture. Make certain the mass is level and not peaked into a cone shape or other irregular shapes because you won't get proper air movement throughout the grain mass.

A number of producers have used Storcide II this year on wheat. We will be monitoring the grain in some of the counties to determine how well the insecticide worked on the grain mass. Most everyone treated their empty bin before filling them. This is a great step for many and I am very pleased they did. At least some of the information I gave them is being used. If you are only going to store the grain for a couple months, I would not treat the grain but would spray down the floors and walls with Tempo. This will help reduce treatment costs. Keep up the good work.



Stored Grain in Baggies

By Russ Patrick

A great number of farmers have stored their grain in the baggies. You may have heard about this method being used in Tennessee. Today, Richard Buntin and I placed insect probes in several bags. These bags hold up to 7000 pounds of wheat. We used baggies that had been treated with Storcide II and some untreated to get a comparison of insect activity in the bags. The probes will be monitored every two weeks and insects identified and counted from each probe should we have any. I expect to have insects in wheat no matter what anyone may say.

Tobacco IPM Report

By Gene Burgess

Jefferson County Intern, Jennifer Lane

Orthene was put in the transplant water in the two fields scouted. And, foliar applications of Orthene have also been applied. As a result these two fields have been practically void of any insects. Some bermuda-grass, morning glory, horsenettle and Johnson grass have been observed.

Bedford County Intern, John Marsh

One field is being scouted. A few flea beetles, one hornworm and a few grasshoppers were observed but below economic threshold levels. Orthene is still giving insect control. Some brown spot was on a few leaves. Crabgrass, trumpet creeper, horsenettle, morning glory and sicklepod were the only weeds observed.

Knox County Intern, Amanda Maddux

Amanda is scouting two tobacco fields. There was evidence of budworm damage but no budworms. A lot of budworm parasites, *Campoletis sonorensis*, were found in the field. Horsenettle and trumpet creeper were found in one field. Sunscald was observed in both fields.

Corn

By Russ Patrick

Yesterday I found some Japanese beetles feeding in corn at the WTREC. They were not causing much injury to the plants. The only time I worry about them is when they begin to feed on the silks and cut them not allowing the corn to pollinate. Here is a picture of the beetle on a corn stalk. I saw several in this patch.



Photo: Japanese beetle. We have had these beetles for several years but there has been no cause to treat them in corn here in West Tennessee.

New Test Kits Help Manage Farm Nitrate Levels

By Darrell Hensley

Funding from USDA's Cooperative State Research, Education, and Extension Service (CSREES), has allowed the Nitrate Elimination Company, Inc. (NECi), in Lake Linden, Mich., to develop a series of on-farm nitrate test kits that allow farm managers to see how nitrate is accumulating and being transferred on the farm. NECi's team designed the kits to test nitrate concentrations in soil, water, plants and livestock

Nitrate is an essential nutrient for plant growth, but it can become a serious threat to health or the environment if allowed to accumulate in animals or water systems. A new test kit will help producers manage nitrate concentrations, reduce costly nitrogen fertilizer applications and protect the environment from pollution. Hopefully development of the kit will help farmers save money, by eliminating unneeded fertilizer applications. With the cost of nitrogen fertilizer increasing rapidly over the past five years, applying excess nitrogen on fields is no longer the easiest option and, drought can exacerbate this process. Nitrate toxicity from accumulated nitrate in hay or corn stalks can be a real problem for growers.

University scientists have tested the accuracy of the test kits and results have been published in several peer-reviewed journals, including the *Environmental Science & Technology* (January 2002), *Crop Science* (January-February 2004), and *Environmental Chemistry Letters* (June 2006) and the trade publications *American Lab News* (February 2001 and September 2004).

The CSREES funded this research project through the SBIR program. Through federal funding and leadership for research, education and extension programs, CSREES focuses on investing in science and solving critical issues impacting people's daily lives and the nation's future. For more information, visit www.csrees.usda.gov.

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OTHER UT NEWSLETTERS WITH PEST MANAGEMENT INFORMATION

Fruit Pest News

<http://web.utk.edu/~extepp/fpn/fpn.htm>

Tennessee Crop and Pest Management Newsletter

http://www.utextension.utk.edu/fieldCrops/cotton/cotton_insects/ipmnewsletters.htm

Ornamental Pest and Disease Update

<http://soilplantandpest.utk.edu/publications/ornamentalnwsltr.html>

Tennessee Soybean Rust Hotline - 877-875-2326

USDA Soybean Rust Web Site

<http://www.sbrusa.net>

This and other "What's Happening" issues can be found at

<http://eppserver.ag.utk.edu/Whats/whatshap.htm>

Entomology and Plant Pathology Web Site

<http://eppserver.ag.utk.edu>

Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product. The author(s), the University of Tennessee Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development. University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating. UT Extension provides equal opportunities in programs and employment.