



Beetles in Flour, Grains, and Other Stored Foods



Confused flour beetle.
(Red flour beetle looks similar.)
Photo by Gary Alpert,
Harvard University.



*Yellow mealworm
larva (above)
and adult (to right).*
Photos from Clemson
University, USDA Cooperative
Extension Slide Series,
Bugwood.org



Injury

Beetles of several species infest packages of whole grain and grain products. The infestation may begin at the time of manufacture or processing, in the warehouses of food distributors, in transit, on the grocers' shelves, or in the home. Most food processors and handlers make every effort to avoid insect infestations, but occasionally the efforts fail.

Infestations are usually discovered when an infested package is opened for use, or when small brown beetles are found in the kitchen near containers of stored grain products. A wide variety of foods may be infested, including flour, cereal, dried fruits, dehydrated vegetables, shelled nuts, chocolate, spices, candies, pet foods, and bird seed. Eggs, larvae, pupae, and adults of the beetles may occur in infested foods.

Description

Two dozen or more different species of insects may occasionally infest grain and grain products used in homes, but four species are much more frequent than the others. Three of these are minute insects, and the fourth is moderate in size.

The **confused flour beetle** (*Tribolium confusum*) is perhaps the most common. It is about 1/7 inch in length, an elongated, dark brown, hard-shelled beetle. Nearly as common is the **sawtoothed grain beetle** (*Oryzaephilus surinamensis*), which is slightly shorter and more slender. For more information see the Insect Diagnostic Lab Factsheet: "Sawtoothed Grain Beetle." The **red flour beetle** (*Tribolium castaneum*), is slightly larger than the confused flour beetle, but both are red-brown in color. The **yellow mealworm** (*Tenebrio molitor*) is a larger insect, with the adult being more than 1/2 inch in length and black in color.

Though these (flour beetles, sawtoothed grain beetle, and yellow mealworm) are the most frequently seen, many others are not uncommon in flour and grains, and vigilance is necessary to detect infestations as early as possible.

Life History

The growth and development of the **flour beetles** and the **sawtoothed grain beetle** are similar. Adult females lay eggs so small as to be nearly invisible to the naked eye. The newly hatched larva, a tiny cream-colored insect with dark head, feeds voraciously upon grain products, and under the best of conditions will complete its development in 6 to 7 weeks. The pupal stage will require another 10 days to 2 weeks, so that it is not uncommon to have 5 or more generations each year. Adult female beetles may lay hundreds of eggs during a two to three year life span.

The **yellow mealworm** develops more slowly than the three small species, seldom completing a generation in four months, and frequently requiring more than one year. Because these large black beetles are so easily seen, and because of their extended period of development, infestations are usually discovered and treated before they become serious in the home.

Management

The following suggestions may be useful in bringing an infestation quickly under control. Prompt action can be important in preventing losses of quantities of foods stored on kitchen and pantry shelves.

1. Carefully examine all susceptible foods that may have been exposed to infested material. Insects may even be found in paper-wrapped products that have not yet been opened in the home. All infested packages should be destroyed. There is no satisfactory way of separating insects from the flour or other foods.
2. The contents from opened packages that appear to be uninfested should be transferred to glass jars or plastic containers with tight-fitting tops. This precaution is necessary because of the possibility that eggs of beetles, concealed in the product when the examination is made, may hatch later and lead to a new infestation if not contained. The glass aids in the periodic examination of the food.
3. Remove all food containers and utensils from the infested area. Remove old shelf paper and clean thoroughly, first with a vacuum cleaner and then with soap and water. Special attention should be paid to cracks and corners where bits of flour, grain, spices, or other may have accumulated.
4. Continue to observe the area for several months after above procedure. If beetles reappear, the clean up may have been inadequate, or a newly infested package may have been brought into the kitchen.

Long term storage of flour and other dried food products often leads to infestation, and therefore, such items should be purchased in quantities suitable for early use unless adequate containers are employed.

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