

Flour Beetles

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Flour beetles. Photo credit: Salvador Vitanza, USDA-APHIS.

Article author: Mike Merchant, Bradleigh S. Vinson, Wizzie Brown

Most recently reviewed by: Pat Porter (2018)

Common Name(s): Confused flour beetle, Red flour beetle

Description

Two of the most commonly found flour beetles are the confused flour beetle, *Tribolium confusum*, and the red flour beetle *Tribolium castaneum*. Virtually identical, the confused and red flour beetles are around 3/16 inch long with flattened bodies well-adapted to crawling into tiny crevices. The best way to distinguish between these two species is to look at the antenna. For practical purposes though, it does not matter which species it is because the control practices are the same.

The larvae of both the confused and red flour beetle are less than 1/8 inch long and feed on flour and food products made from ground and processed grain. Larvae do not penetrate whole kernels of grain, but they can feed on broken kernels and flour, corn meal etc.

These long-lived beetles are serious pests of grain processing facilities and food warehouses, but can also be found in grocery stores and home cupboards.

Red flour beetles are 1/8 to 3/16 inch long, flattened, and dark cherry to dark brown in color with gradually-clubbed antennae, with a 3 segmented club. They are known to fly.

Confused flour beetles are 1/8 inch long shiny, flattened, oval, reddish-brown beetle. The head and upper parts of the thorax are densely covered with minute punctures. The antennae of the confused flour beetle gradually enlarge toward the tip, producing a four-segment club. They cannot fly but are excellent crawlers.

Origin and Distribution

Mouthparts are for chewing. They are found in stored food products like flour, cereals and other products (e.g., dried beans, peas, peppers and fruits, shelled nuts, spices chocolate, snuff, museum specimens and some drugs). Adults and larvae feed throughout stored food, primarily in milled or prepared products. They are perhaps the most common pest of processed flour. These species are often used as a test animal in laboratory experiments because they are easy to keep in culture.

These insects are found world-wide infesting stored food; infestation may affect the flavor of product. They are medically harmless, even if eaten.

Habitat & Hosts

The confused and red flour beetles cannot feed on whole undamaged grain; they are scavengers, they feed on grain materials damaged by other pests or during transportation or storage.

Both types of beetles are often found not only in infested grains, but in crevices in pantries and cabinet, as well. Damage to food is caused somewhat by the beetles feeding, but also by their dead bodies, fecal pellets, and foul-smelling secretions. In addition to creating a foul odor, the beetles presence encourages the growth of mold.



Photo credit: Patrick Porter.

Life Cycle

Adult beetles are active and move about irregularly. They can live for over a year. Eggs laid by females hatch in 5 to 12 days. Larvae are white, tinged with yellow, slender and cylindrical. They develop through 5 to 12 stages (instars) and grow to about 3/16 inch long over as few as 30 days. They have two short appendages on the end of the last abdominal segment. There may be 5 generations per year.

Females may lay up to 1,000 eggs during their life span, which may last several years under ideal conditions. Because adult red flour beetles are very active, can fly, and are sometimes attracted to light, they disperse easily from their initial infestation point. Adult beetles consume food.

Management

If you live in the State of Texas, contact your local county agent or entomologist for management information. If you live outside of Texas, contact your local extension for management options.

Flour beetles feed on almost every grain-based food consumed by people and their pets, so one may encounter these beetles more than any other stored food pest. Thorough inspection is required to discover the source of flour beetle infestations. Sanitation and proper storage of food is necessary to control flour beetles. Items should be inspected for infestation before being stored in the facility. Temperatures above 120 F for several hours will kill flour beetles.

Nonchemical control

The first step in controlling pantry pests is to find and eliminate infested items. Often all that is needed to solve the problem is to remove an infested package of flour, macaroni, or cake mix. But finding the source of an infestation is not always easy. Infested packages are usually the oldest, most difficult to reach foods in the pantry. Even unopened containers may be infested; some pests can easily penetrate plastic, waxed paper, and cardboard containers. Before buying an item in the store, check that the bag or container is well sealed and undamaged.

Good sanitation is important. Infestations often start in pet foods, spilled grains, or other foods. Clean up spilled food promptly. Discard old packages of grain and pasta. Vacuum and clean pantry areas periodically to remove spilled foods. Remove and clean underneath shelf paper. Caulk around pantry edges and in cracks and crevices to reduce areas where spilled food may collect.

Most pantry pest problems can be prevented by using all dried food within 2 to 4 months of purchase. Spices and other products kept for longer periods should be sealed in airtight containers.

Pet food can be a special problem. The most commonly infested pantry items are birdseed and dog and cat foods. Store pet foods in well-sealed plastic buckets or storage containers and use them promptly. Clean the containers thoroughly before refilling them with food.

Occasionally, mice or other rodents can cause a persistent beetle infestation. Hoarded seed and grain in abandoned rodent nests can support a small population of pests. Old rodent bait that contains grain also can harbor insects. When controlling rodents, prevent insect problems by placing the bait where it can be retrieved and discarded after the rodents are controlled.

Heat or cold treatments can eliminate pests in some food items such as pet food, bulk grains and beans, and home-grown dried beans or peas. Put the product in the oven at 130 degrees F for 1 hour, or in the freezer for 7 to 14 days. To prevent an infestation, store foods that may attract pantry pests in the refrigerator or freezer.

Chemical control

On rare occasions, insecticides may be needed to control difficult infestations. Insecticides can reach inaccessible areas that cannot be easily cleaned; they can also help reduce heavy pest infestations more quickly.

Insecticide sprays may be applied to crevices and void areas around cupboards, drawers, and pantries. Before spraying, remove all food products, utensils, and containers from the treatment area. Allow the spray to dry before placing clean shelf paper on the shelves and returning food, utensils, or containers to the pantry.

Insecticide products that are labeled for use in food- storage areas generally contain ingredients that are short-lived and relatively safe to use in the home. Active ingredients of these products include pyrethrins, resmethrin, allethrin, and tetramethrin.

For areas where long-term residual control is desired, look for products containing synthetic pyrethroids, such as permethrin, esfenvalerate, cyfluthrin, or bifenthrin. Aerosol fog products can temporarily suppress infestations of flying insects, but these fogs will not kill pantry pests in food containers or protected locations.

Before using an insecticide, always make sure that the label says that the product may be used indoors and in kitchens. Never spray food, dishes, utensils, or cooking items with pesticides.

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