FLOUR BEETLES

Flour, cornmeal and other grain products stored in kitchens are frequently attacked by insects. Flour moths, weevils, grain beetles, and flour beetles are common pests of grain products stored in kitchens and pantries.

The most common beetles associated with flour or stored grain include the flat grain beetle, confused flour beetle, red flour beetle, and the sawtoothed grain beetle. Adults and larvae of these beetles infest flour, bulk cereals, broken packages of breakfast foods, pet food, and dried fruits.

Adult beetles lay eggs on or in the food material. Development through the egg and larval stages is rapid in warm rooms. The larvae transform to a pupal stage from which new adults emerge to lay more eggs. Infestations can build up rapidly from a small beginning under warm conditions.

Control. Controlling flour beetles, like other pantry pests, requires:

1.) careful inspection of all cereal foods
2.) discarding the heavily infested material
3.) repackage material in new containers
4.) vacuum kitchen cabinets

Vacuuming the cabinets will be much more beneficial than washing them! Vacuuming will remove flour dust and scraps in the cracks and crevices of the cabinet. Washing may make a paste of the flour.
The DRUG STORE BEETLE (Stegobium paniceum) is similar to the cigarette beetle in appearance but is slightly larger, more elongate, and has distinctly striated wing covers. It is 2-3 mm long. The last 3 segments of the antennae are like a saw. Its food is even more varied than that of the cigarette beetle, and it is said to feed "upon almost anything except cast iron." Its peculiar diet includes such odd materials as strychnine and books as well as flour, oatmeal, spices, and other foods.

The CADELLE (Tenebroides mauritanicus) is a black beetle 8-14 mm long, with the head and pronotum distinctly separated from the forewings by a loose joint. The large, whitish, fleshy larvae are about 15-20 mm, long when fully grown and may be recognized by their prominent black heads, the paired black spots on the 3 segments of the thorax, and 2 short, dark hooks at the posterior end of the abdomen. Larvae burrow into the woodwork of grain bins, and a seemingly clean bin may harbor thousands of larvae, pupae, and adults. The life cycle requires from 2 to 14 months and many adults live more than a year. The female lays about 1,000 eggs in protected situations, such as in cracks near food. The cadelle feeds upon grain and grain products and does much damage to bolting silk in flour mills. It is especially injurious in mills with poor sanitation.

The LESSER GRAIN BORER (Rhyzopertha dominica), a brown or black, slender, cylindrical beetle with numerous coarse elevations on the pronotum, is about 2-3 mm long. It is most common in the Gulf States but may occur anywhere in the country. Both larvae and adults destroy wheat and corn kernels. The females lay up to 500 eggs each, dripping them in loose grain. In warm weather the life cycle is completed in about one month.

The CONFUSED FLOUR BEETLE (Tribolium confusum) and the RED FLOUR BEETLE (Tribolium castaneum) are similar in appearance and habits. Adult confused flour beetles have the antennae gradually enlarged toward the tip; the antennae of the red flour beetle have the last 3 segments abruptly enlarged. T. confusum cannot fly, but T. castaneum may fly. The elongate, reddish-brown beetles are about 3-4 mm long, with a distinct joint between the thorax and abdomen. The adult female may live for as long as 2 years, depositing 300 to 400 eggs. The mature larva is brownish-white, has 6 legs, and is up to 13 mm long. The life cycle requires 1 to 4 months when temperatures are favorable. These beetles are very important pests infesting many flour mills, warehouses, and grocery stores. They also feed upon grain, beans, dried fruits, nuts, chocolate, and other foods in the home.
The FLAT GRAIN BEETLE (Cryptolestes pusillus) is one of the smallest beetles found in stored grain. It is a tiny, reddish-brown beetle about 1-2 mm long with antennae nearly as long as the insect. It is usually found with other grain pests.

The YELLOW MEALWORM (Tenebrio molitor) and the DARK MEALWORM (Tenebrio obscurus) are very similar in appearance. The adults are large beetles 12-15 mm in length, the adult of T. molitor being dark shiny brown to black, and T. obscurus, a dull black. The larvae resemble wireworms and are familiar to many people as dried food for aquarium animals. Although these insects are cosmopolitan in distribution, they are rarely of major importance. Infestation of the human intestine by larvae of the yellow mealworm has been reported.

SPIDER BEETLES (Ptinus spp.) are occasionally found infesting broken grain. They are quickly distinguished by their spider-like form. Although widespread, they rarely cause serious damage in the United States. Ptinus tectus may cause intestinal cantharasis.

The RICE WEEVIL (Sitophilus oryzae), worldwide in distribution, is probably the most important grain pest. This small, reddish-brown-to-black snout beetle, 2-4 mm long, has small, round pits on the thorax and two reddish or yellowish spots on each wing cover. The larva is short, fat, and whitish. The adult is a strong flier. The larva and pupa develop within a single grain of rice or kernel of corn, from which the adult weevil emerges about 30 days after the egg is laid. The adult female lives 4 to 5 months, depositing 300 to 400 eggs in small openings bored into grain. The rice weevil feeds on corn, rice, wheat, barley, and other grains.

The GRANARY WEEVIL (Sitophilus granarius) is similar to the rice weevil in appearance, but with oval pits on the thorax and with the wing covers uniformly dark brown. This insect has become thoroughly domesticated, losing its power of flight and forsaking wild and cultivated grain fields for the grain storehouses of man. This snout beetle is slightly larger than the rice weevil and lives from 7 to 8 months. Whereas the rice weevil is a major pest in the South, the granary weevil more often frequents the northern states.
The **BEAN WEEVIL** (*Acanthoscelides obtectus*) is a short, snout beetle that feeds upon stored beans and peas. The adult is 2-3 mm long with reddish legs and a light olive-brown color, mottled with darker brown and gray. The body narrows evenly toward the head. The tiny, legless larva and pupa live within the bean, whereas the adult emerges from the bean and feeds upon other materials. The female deposits eggs in beans, both in the field and in storage. Six or seven generations may be completed in a year. As many as 28 weevils have been known to develop in one bean. The use of tight sacks has been found to afford considerable protection. Bean vines and other refuse should be burned in the field or plowed under to prevent propagation of this insect. The adults hibernate in fields and warehouses.

The **PEA WEEVIL** (*Bruchus pisorum*) appears similar to the bean weevil but is larger (3-5 mm long), brownish flecked with white, and with black to gray patches and scales. There is one generation per year. The adults overwinter in peas in the field or in storage. Egg deposition occurs only in the field.

The **SAW-TOOTHED GRAIN BEETLE** (*Oryzaephilus sari namensis*) is an important pest known throughout most of the world. A closely related species, *Oryzaephilus mercator*, is also important and is often mistaken for the saw-toothed grain beetle. The adult is a small, active, brown beetle 2-3 mm long, with a flattened body and 6 saw-toothed projections on each side of the thorax. The larva is yellowish-white, about 2 to 3 mm long, with a brown head. The abdomen tapers toward the tip. The females live from 6 to 10 months, depositing 45 to 285 eggs in foodstuffs. Several generations may occur each year, as the life cycle requires only 30 to 4 weeks during the summer. The saw-toothed grain beetle is an important pest in grocery stores, food warehouses, and grain storage. It readily penetrates packaged cereals, dried fruits, and candies. It also attacks flour, meal, sugar, drugs, dried meat, and tobacco.

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