

School Pest Solutions



Pantry Pests

Various pantry pests may infest stored foods. They commonly infest flour, cereals, cracked grains, baking mixes and processed foods, crackers, macaroni, cured meats, powdered milk, dried fruits, nuts, popcorn and spices, making them a serious problem for schools to prevent. Insects that feed on these products may also infest other grain-based items such as pet foods, birdseed and ornamental corn. Dried flower arrangements may also be attacked.

Identification and Biology

The Indian Meal Moth (*Plodia interpunctella*) is the top-most common food-infesting moth found in schools, homes, grocery stores and any place where dried pet foods are produced or stored. It feeds on a large variety of stored food products, but infestations often are started through dried pet food or birdseed. Nuts are a favorite breeding source; infestations have been found in nut caches of squirrels in attics and chimneys.

The larva prefers coarse grades of flour, whole grains, cereal, dried fruits, seeds and spices. Foods infested with these insects will have the larva's silk webbing present; look to find it at or near the food surface. Adult moths are about ½-inch long and have distinctive wing markings. The base of the forewing is pale grey and the outer two thirds is reddish-brown with a coppery luster. They have a unique way of folding their wings while 'resting' at an angle against a wall. The larvae are generally creamy-white with shades of yellow, pink, brown or green. Mature larvae, which are about ½-inch long, usually move away from the feeding site and spin a silk cocoon in which to pupate.



Indian Meal Moth
(*Plodia interpunctella*)



Indian Meal Moth
(*Plodia interpunctella*)



Indian Meal Moth adult

The Dermestid family are common pests that scavenge and feed on animal matter like dried meats, dead insects, hides and woolens. The species that feed on wool and other natural fibers or blends are sometimes called carpet beetles. Closely related species, such as the warehouse beetle, varied carpet beetle and larder beetle have adapted for other foods and now also feed on grain and grain-based products. They are especially common in flour and cereals but also are found in candy, cocoa, cookies, corn meal, nuts, pasta, dried spices, and many other dry foods.



Black Carpet Beetle



Carpet Beetle larva



Larder Beetle

Usually only larvae can be found in infested food. After pupating, the adults will leave the food to feed on pollen. Sometimes only the larval “skins” will be found. Dead adults are often found in windowsills because they fly to the light, trying to get outside.

Since some of these species feed on woolens and cloth, infestations in the pantry may spread and damage valuable clothing and furs. Proper cleaning and storage of woolen and cloth products will help prevent damage.

Sawtoothed Grain Beetle (*Oryzaephilus surinamensis*) is another very common pantry pest. It does not feed on intact whole grains but feeds on many processed food products. This may include breakfast food, dried fruits, nuts, sugar, chocolate, and macaroni. It especially likes to eat oatmeal and birdseed. Their flattened body gives them the ability to get into sealed boxes.

Adults are nearly ¼-inch long, slender, with brownish red coloring. They are normally very active. Their name comes from the six sawlike teeth on either side of the thorax behind the head. After finding some potential food, the female will lay white, shiny eggs that hatch into cream colored larvae. There can be as many as seven generations in a given year, but sawtoothed grain beetles often stop breeding in the winter unless buildings are heated and moisture is sufficient. Adults are very long lived and remain active in the winter.



Sawtoothed Grain Beetle

Cigarette Beetles (*Lasioderma serricorne*) and **Drugstore Beetles** (*Stegobium paniceum*) small, stout beetles are common in kitchens where they will eat cereals, spices, and other packaged foods. Since they closely resemble each other, they are often confused. The heads of both beetles are tucked under the prothorax and are not visible from above. Both are brown and about the same size.

The two beetles can be distinguished by their wing covers. The wing covers of the drugstore beetle have rows of longitudinal grooves while those of the cigarette beetle are smooth. Another distinguishing feature is the antenna. The drugstore beetle has a three-segmented club while the cigarette beetle has an antenna that looks a little like a saw blade. Both the cigarette and drugstore beetles belong to the family Anobiidae and can be confused with some wood-boring beetles of the same family. It is important to have the beetle identified because wood-boring beetles have greater damage potential than the cigarette and drugstore beetle. However, if the beetles are found in food or grain products, it is most likely a cigarette or drugstore beetle.



Drugstore Beetle



Cigarette Beetle and Larva

Other Pantry Pests

Flour Beetles (*Tribolium spp*) contain many species of tiny beetles that infest flour, but the two most common flour beetles are the confused and red flour beetles. These beetles are scavengers because they must wait for other insects to damage grain kernels before they can attack. In schools, they can be found feeding on flour, cracked grains, cake mixes, beans, peas, dried fruits, nuts, chocolate, and spices.

They can be told apart by inspecting the antennae. On the red flour beetle, the antennae has three-segmented club on the end. The antenna of the confused flour beetle gradually enlarges toward the tip, ending in a four-segmented club. In addition, the sides of the red flour beetle's thorax are curved while the confused flour beetle's thorax has straighter sides.

Granary and Rice Weevils (*Sitophilus spp*) damage whole grains or seeds. They do not usually feed on flour or cereals unless it has become caked.

Grain Mites (*Acarus siro*) are pests of food products like cereals, dried vegetable materials, cheese, corn and dried fruits. These mites are often found in conjunction with fungal growth- this is because they reproduce quickly in habitats with high humidity. Severe infestations result in brownish tinge over the commodity, called "mite dust" because of the light brown coloring of the mite legs. This "mite dust" gives off a "minty" odor if the mites are crushed. The life cycle from egg to adult takes only about two weeks at normal room temperatures. Mites will migrate to other food sources in times of overcrowding.

Damage

Several stages (egg, larva, pupa and adult) of these insects may be present at the same time in infested products. Since schools are generally kept warm, these insects may continually reproduce and many stored product infestations can be found nearly any time of the year.

Prevention

Once a pantry pest infestation is suspected, attempt to identify the pest and locate the source. Occasionally, the source of an infestation can be very hard to find. Remember that it may be in an unopened package. Look behind appliances where food may have been spilled. Mice will sometimes collect seeds and hoard them in walls, under cupboards or dishwashers where the infestations are nearly impossible to find. The following tips may be useful.

- Purchase food in package sizes that can be used up in a short time. Do not store food products more than two to four months, if possible. Use older packages before newer ones and opened packages before unopened ones.
 - When purchasing packaged foods, be certain containers are not damaged, and seals are intact.
 - Store dried foods in insect-proof containers such as screw-top glass, heavy plastic or metal containers. This will prevent entry or escape of insects. Cardboard, paper or plastic wrapping will not prevent insect infestations.
- Keep food storage areas clean and do not allow crumbs or food particles to accumulate, as exposed food will attract insects. Cleanliness is especially important in areas where pet foods and birdseed are stored.

Management Options

Inspection and identification of all potential food sources is essential to controlling the infestation. Control requires locating and discarding all infested items. Do not forget to check unopened boxes or containers because many insects can chew their way into cardboard and foil.

Infested items can be salvaged by freezing three to four days or by being heated in a 140°F oven for an hour. Empty and thoroughly vacuum cupboards or shelves holding infested food items, paying attention to cracks and corners. Vacuuming picks up hiding insects and spilled or infested material. To prevent reinfestation, empty the vacuum cleaner or discard the vacuum cleaner bag after use.

Do not use insecticides for controlling these or other insects in pantry areas. Washing shelves with detergent, bleach, ammonia or disinfectants will not have any effect on these pests since these insects lay their eggs on suitable food. Removing infested items and thoroughly cleaning with a vacuum is usually sufficient. As a precaution against reinfestation, store susceptible foods in tightly sealed glass, metal or heavy plastic containers or in the refrigerator or freezer.

Information from this page can be found on the University of Nebraska's "School IPM How-To Manual."

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Whitney Cranshaw, Colorado State University, Bugwood.org

Clemson University, USDA Cooperative Extension Slide Series, Bugwood.org

Joseph Berger, Bugwood.org

Natasha Wright, Florida Department of Agriculture and Consumer Services, Bugwood.org

For More Information

Hillary Peterson

Maine School IPM Coordinator

Maine Department of Agriculture, Conservation and Forestry

28 State House Station

Augusta, ME 04333-0028

E-mail: hillary.peterson@maine.gov

Phone: 207-215-4793

Fax: 207-287-7548

Written by Kathy Murray, Ph.D.