

Insect pests of stored foods

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Insects infesting stored foods are one of the most common household insect problems. The many different kinds of insects that infest stored dried foods are often referred to as "pantry pests."

Significance

Pantry pests contaminate more food than they consume, and most people find the contaminated products unfit for consumption. Pantry pests are often discovered when they leave infested foods to crawl or fly about the house. They often accumulate in pots, pans or dishes or on window sills. Fortunately, they do not bite or sting people or pets nor do they feed on or damage the house structure or contents.

What do they eat?

Nearly all dried food products are susceptible to insect infestation, including cereal products (flour, cake mix, cornmeal, rice, spaghetti, crackers, and cookies); seeds such as dried beans and popcorn; nuts; chocolate; raisins and other dried fruits; spices; powdered milk; tea; and cured meats. Non-food items that may be infested include birdseed, dry pet food, ornamental seed and dried plant displays, ornamental corn, dried flowers, garden seeds, potpourri, and rodent baits.

Stored food insects are most likely to infest products that have been opened but are also capable of penetrating unopened paper, thin cardboard, and plastic, foil, or cellophane-wrapped packages. They may chew their way into packages or crawl in through folds and seams. Insects within an infested package begin multiplying and can spread to other stored foods not only in the same area but in other rooms in a home. All stages (egg, larva, pupa, and adult) may be present simultaneously in infested products.

Where do they come from?

A stored food product can become infested anywhere during the process from production until it arrives in your home. However, stored food is most likely to become infested in stores or in homes. Most of the stored food insects also are pests of stored grain or other commodities and may be relatively abundant outdoors. Food products that are left undisturbed on the shelves for long periods are particularly susceptible to infestation. However, foods of any age can become infested.

Identification and biology of common stored product insects

Indianmeal moths (*Plodia interpunctella*) are the most common moths infesting food in homes. These moths have a wingspan of 1/2 to 5/8 inch. When at rest, they fold their wings behind themselves, over their bodies. The base of the front wing is pale gray or tan and the outer two-thirds

is reddish-brown with a coppery luster. The wing markings are distinctive, but may be less clear if the scales have been rubbed from the wings. Indianmeal moths may be found inside infested products or flying around homes.

The larvae are whitish worms with shades of yellow, pink, green, or brown and grow to 1/2 inch long.

Only the larvae feed in stored products, which can be any dry stored food or whole grain. Foods infested with these insects will have silk webbing present on the surface of the product. Larvae often leave the food when mature and may move long distances before stopping to spin a cocoon. It is common to find caterpillars and cocoons on ceilings and walls. Adult moths may be seen up to several weeks after the food source has been removed.



Phil Pellitteri, Univ. of Wisconsin

Indianmeal moth



Jeff Hahn, Univ. of Minnesota

Sawtoothed grain beetles

Meal moths (*Pyralis farinalis*) have a wingspan of about 3/4 - 1 inch. Their forewings have a dark reddish brown band across the top and bottom of the wings with an olive or yellowish green band, outlined by wavy white lines in the center. Their abdomen is typically curved up at a 90° angle when at rest. The larvae have a black head and a whitish body with some orange at the end of the body. They often form feeding tubes made of silk and tiny pieces of food. Meal moths are found feeding on a wide variety of flour and grain products and seeds, especially when they are damp. These moths are not common in homes.

Sawtoothed grain beetles (*Oryzaephilus surinamensis*) are about 1/10 inch long, slender, flattened, and brownish-red to almost black in color. They are easily identified by the saw-like teeth on each side of the thorax. Larvae are cream-colored, slender, and about 1/8 inch long, although they are rarely noticed by residents. Sawtoothed grain beetles are found in many different food items, including dried fruit, cereals, nuts, dried meat, macaroni, and seeds.



Jeff Hahn, Univ. of Minnesota

Meal moth



Laura Jesse, Iowa State Univ.

Sawtoothed grain beetles

Drugstore beetles and cigarette beetles (*Lasioderma serricorne* and *Stegobium panicum*) are about 1/8 inch long, oval, and brown. The head is bent downward giving the insect a humped appearance. Both species fly and can be found around windows. Larvae are 1/8 inch long when mature, and yellowish-white with a light brown head (the larvae are not usually noticed by residents). They have a curved body covered with fine hair. Cigarette and drugstore beetles feed on a wide variety of dried plant products such as spices, macaroni and other grain based foods, dried flowers, tobacco products, and even paper products, including books.



Jeff Hahn, Univ. of Minnesota

Drugstore beetles



Jeff Hahn, Univ. of Minnesota

Cigarette beetle

Flour beetles (*Tribolium confusum* and *T. castaneum*) are 3/16 inch long, reddish-brown, and elongate oval in shape. Larvae are cylindrical, whitish, or cream-colored and up to 1/4 inch long and have two small pointed spines on the tail end (the larvae are not usually noticed by residents). Two species of flour beetles may be found: red flour beetles are common in homes and the confused flour beetle is a frequent pest in flour mills. Flour beetles infest many types of dried food products, such as flour, bran, cereal products, dried fruits, nuts, and chocolate.

Warehouse and cabinet beetles (*Trogoderma* spp.) are elongate oval and 1/8 to 3/16 inch long. They may be solid black or mottled with yellowish-brown markings. Larvae are long and narrow, yellowish to dark brown, hairy and generally grow to about 1/4 inch (although they may not be noticed

by residents). Warehouse and cabinet beetles feed in a wide variety of food products, such as grain products, seeds, dried fruits, animal by-products skins, fur, hair, and pet food. They are also known to feed on dead insects and animal carcasses.



Laura Jesse, Iowa State Univ.

Flour beetle



Phil Pellitteri, Univ. of Wisconsin

Warehouse beetle

Granary, rice, and maize weevils (*Sitophilus* spp.) are slender insects with a conspicuous snout projecting forward from the head. They are dark brown, sometimes with four orangish spots on the wing covers. They are less than 3/16 inch long. Larvae are white, legless, and looked wrinkled and are only found inside whole kernels or seeds. These weevils attack only whole grains or seeds, leaving small round exit holes in infested kernels. They rarely are found in nuts, dried fruits, macaroni, and caked or crusted milled products such as flour. (A different, larger species of weevil can be found in homes during the fall due to emergence from acorns or hickory nuts collected and stored inside).

Spider beetles (family *Ptinidae*) are reddish brown, 3/16 inch beetles with long legs and a somewhat, spider-like appearance. The larvae are C-shaped and whitish; they remain in infested material and aren't normally seen. Spider beetles infest a variety of dried plant products.



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Maize weevil



Phil Pellitteri, Univ. of Wisconsin

Spider beetle

Bean weevils (*Acanthoscelides obtectus*) are a type of seed beetle. They are a mottled light and dark brown, broadly oval, and about 1/8 inch long. They have short wing covers which exposes part of the abdomen. Unlike other weevils, bean weevils lack a conspicuous snout. The larvae are small, whitish, legless, and C-shaped. They feed inside dried beans and peas.



Laura Jesse, Iowa State Univ.

Bean weevil

Management

Prevention

Purchase dried foods in quantities small enough to be used up in a relatively short period of time. Use oldest products before newer ones, and opened packages before unopened ones.

Inspect packages or bulk products before buying. Packages should be sealed and unbroken. Also check the freshness packaging date. Look for evidence of insects, including holes in the packaging or wrapping.

Store insect-free foods in tightly closed glass, metal, or heavy plastic containers especially if you do not use

up the food very quickly (this is less important for food that is used up more quickly). You can also store susceptible foods in the refrigerator or freezer.

Keep food storage areas clean. Do not allow crumbs or spilled food to accumulate. Remove and discard old, unused products and inspect the remainder. Thoroughly clean cracks and corners with a vacuum cleaner. Also check and clean areas where pet food and birdseed are stored as these are particularly common sources of infestations.

Washing areas with detergents, ammonia, or bleach will not prevent insect infestation. There is no evidence that proves that placing bay leaves or sticks of spearmint gum in a cupboard will prevent or deter stored food insect pests.

Detection

There are several ways you may become aware of a stored product infestation. If you find small beetles in susceptible food products, that is a sure sign of a problem. It is also common to find stored product beetles on counters and in cupboards. In some cases, the beetles are attracted to light and may be found around windows.

You may find Indianmeal moths flying around kitchens and other rooms. As caterpillars move away from infested food to pupate, they can be found on walls and ceilings in rooms adjacent to infestations. When examining food packages, you may not only find caterpillars but silk webbing inside infested packages.

Be careful, as not all small beetles or moths found indoors are necessarily a pantry pest. If there is not a direct association with food, be sure the insects are identified correctly by an expert to determine whether they are a stored product food insect.

When you know a stored product problem is present, be sure to examine all susceptible food as there could be more than one infested source. When inspecting them, look at the top surface of products with a flashlight or pour the package contents onto a cookie sheet.

Pest elimination

When you find food that is infested, just throw it away.

Use a vacuum cleaner to thoroughly clean cabinets and shelves, especially in cracks and corners. This will pick up crawling insects and spilled or infested material that is present. Empty the vacuum cleaner or discard the vacuum cleaner bag after use to prevent reinfestation. Washing shelves with detergent, bleach, ammonia, or disinfectants will not have any effect on insect pests.

As a precaution against re-infestation, store susceptible foods in sealable glass, metal, or heavy plastic containers or in the freezer or refrigerator until you are convinced the infestation is gone. It is not unusual to see an occasional Indianmeal moth flying for as long as 3 weeks after the infested sources have been eliminated. However, if you continue to see Indianmeal moths after three weeks, that indicates there is an infested food source that has not been discovered yet.

If you have older food products and you are not sure if they are infested, you can place these products in the freezer at 0 degrees for at least 4 days or in shallow cookie sheets or pans in an oven at 130 degrees for at least 30 minutes. These temperatures will kill any eggs or insects that may be present. If insects are infesting ornaments or decorations made with plant products or seeds, place the items in a freezer for at least four days.

Insecticides

Insecticide sprays are not recommended for controlling insects in stored food cupboards. Household insecticides have no effect on insects within food packages and any control of insects outside of them is temporary unless the source of the infestation is found and eliminated.

Also, the amount of extra work that is necessary when treating cupboards or other areas usually is prohibitive. It is necessary to first remove dishes, glasses, and food packages so they are not contaminated by pesticides. Time is then needed to allow the spray to dry before items can be returned.

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