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G93-1130 Insect Pests of Stored Food in Kitchen and Pantry

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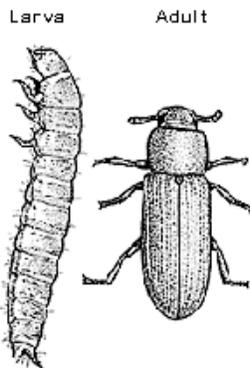
Insect Pests of Stored Food in Kitchen and Pantry

This NebGuide describes seven of the most common insects that infest stored food products and provides prevention and control recommendations.

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Finding insect-infested food products in the kitchen and pantry is relatively common in Nebraska. Dried food products that are often subject to insect infestations include: flour, cereals, cracked grains, cake mixes, crackers, powdered milk, macaroni, cured meats, dried fruits, nuts, popcorn, and spices. Other items such as pet foods, seed displays, ornamental corn, dried flower arrangements and ornaments made from plant parts may also become infested.



Insect pests most often encountered in stored food products are flour beetles; sawtoothed grain beetles; Indian meal moths; cigarette and drugstore beetles; dermestid beetles; granary, rice, and maize weevils; and spider beetles. All stages (egg, larva, pupa and adult) of these insects may be present simultaneously in infested products.

Figure 1. Flour beetle

The first indication of an infestation is usually the presence of small brown beetles or moths in cupboards, on counters and cabinets, and around windows. Upon closer inspection, these insects may also be found in opened packages or containers of food, and in the cracks and crevices of cabinets and cupboards.

Unopened packages may be infested as well. Insects are sometimes brought into the home along with infested food products. They then begin multiplying and spread to other stored foods.

Once an insect infestation is suspected, identify the pests and locate the source. The descriptions and drawings provided in this publication should help you to recognize the common insect pests found in kitchens and pantries.

Stored-Product Insects

Flour Beetles

Confused and red flour beetles are serious pests in flour mills and food storage areas. Adults of both species are very similar in appearance. Larvae and adults feed on a number of foods including flour, cracked grains, cake mixes, beans, peas, dried fruits, nuts, chocolate, spices, and tobacco. Flour beetles do not feed on whole, undamaged grains. Heavily infested food products have a foul odor.

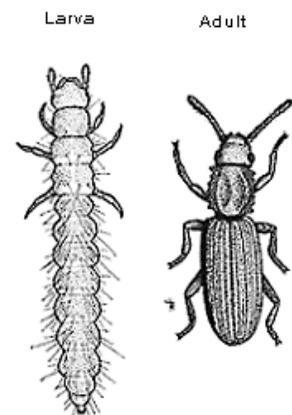
Adult beetles are reddish brown, 1/7 inch long, and have a smooth-sided thorax (body section between the head and abdomen), *Figure 1*. Females lay eggs on containers or in the food itself and eggs hatch in 5 to 12 days. The larvae (worm-like immature stages) are cylindrical, yellowish-white, up to 1/4 inch long, and mature in about 30 days. Pupation occurs near the surface of the food mass. There may be 4 to 5 generations per year, depending on temperature.

Sawtoothed Grain Beetle

This insect is perhaps the most commonly found pantry pest. Although not a feeder on undamaged, whole grains, it feeds on numerous food products including cereals, bread, dried fruits, nuts, sugar, macaroni, and seeds. The small size and flat body of these beetles enable them to penetrate very narrow cracks and crevices of poorly sealed packages.

Figure 2. Sawtoothed grain beetle.

Adults are nearly 1/4 inch long, slender, flattened, brownish red, and have six saw-like teeth on either side of the thorax behind the head (*Figure 2*). The female lays 45-287 white, shiny eggs into foodstuff. The eggs hatch in 3 to 5 days. The larvae are yellowish-white and less than 1/4 inch long at maturity. Larvae pupate within the food material and develop to the adult stage. The complete life cycle (egg to adult) may occur in 40 to 60 days. There may be up to six generations each year.



Indian Meal Moth



This cosmopolitan insect feeds on a large variety of food products. Although coarse grades of flour are preferred, Indian meal moth larvae are often found feeding in whole grains, cereal, dried fruits, nuts, seeds, and powdered milk. Foods infested with these insects will have silk webbing present, especially near the food surface.

Figure 3. Indian meal moth.

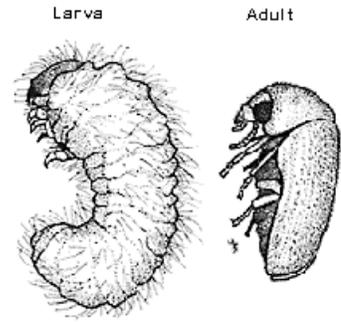
Adult moths are nearly 1/2 inch long and have distinctive wing markings. The base of the forewing is pale grey and the outer two-thirds is reddish-brown with a coppery luster (*Figure 3*). The larvae are generally dirty-white in color with shades of yellow, pink, brown, or green, depending on its food. Mature larvae, which are about 1/2 inch long, usually move fairly long distances from the feeding site before pupating within silken cocoons. There may be 4 to 8 generations of Indian meal moths per year.

Cigarette and Drugstore Beetles

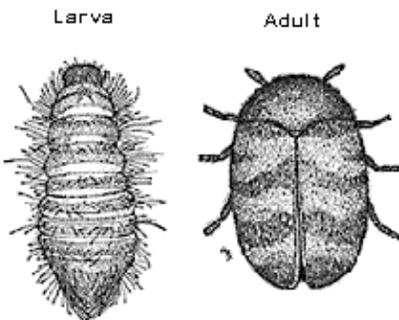
These beetles feed on a wide variety of materials including spices, biscuits, beans, dates, dried fruits, flour, peanuts, tobacco, yeast, dried meat, and leather.

Figure 4. Cigarette beetle

Adult beetles are about 1/8 inch long, light brown and oval. The head is bent downward, giving them a strongly humped appearance (*Figure 4*). Larvae are nearly 1/6 inch long at maturity, curved, and hairy. Pupation occurs in silken cocoons in the food mass. There may be 3 to 6 generations of these beetles each year.



Dermestid Beetles



Several species of dermestids feed on dried meats, cheeses, dead insects, hides, and wools. However, in some cases they can also feed on stored foods including grains, seeds, and dried fruit. These insects are often called carpet beetles because some species are damaging to wool carpeting.

Figure 5. Dermestid beetle.

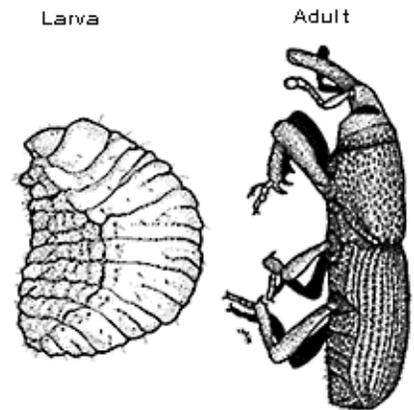
Adult beetles may be oval or round, mottled grey to black, and are 1/8 to 3/8 inch long (*Figure 5*). The larvae are almost similar in size to the adults for each species and tend to be banded with dark, long hairs. Up to 6 generations can occur each year.

Granary and Rice Weevils

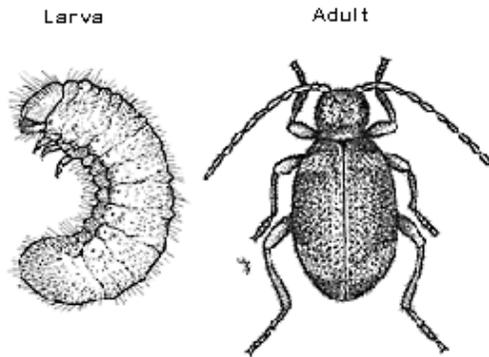
These insects generally damage whole grains or seeds, but also have been observed feeding on nuts and beans. They generally do not feed on flour or cereals unless it has become caked.

Figure 6. Granary weevil.

Adult weevils are dark brown and nearly 1/6 inch long. They have a snout projecting from the head and the wing covers have distinct ridges present (*Figure 6*). Females lay eggs on seeds, kernels, or other suitable foods, and hatching occurs in 3 to 7 days. The larvae are white, legless, and usually feed inside of whole kernels or seeds. Pupation normally occurs within hollowed-out kernels or seeds. Adults emerge in about 5 to 16 days and there are 3 to 5 generations each year. Weevil-damaged grains are typically hollow and have small round emergence holes.



Spider Beetles



These insects have a compact body shape. Their six long legs and two long antennae resemble the eight legs of a spider (*Figure 7*). They feed on numerous materials such as grain, seeds, cereals, dried fruits, meats, wool, and hair.

Figure 7. Brown spider beetle.

Adults vary in size from 1/8 to 1/4 inch long, are usually oval, and are reddish-brown to black. The head is partially visible above by the thorax. Females lay eggs within the food mass, which hatch in about 8 to 12 days. Mature larvae are approximately 1/4 inch long, cream to tan in color, and curved. Larvae usually curl their bodies when disturbed. Most spider beetles have 2 or 3 generations each year.

Prevention

The following procedures will help prevent infestations

1. Be alert, because insect infestations usually start from infested food items and/or plant materials brought in from other sources.
2. Purchase dried food in package sizes that can be used up in a short time. Do not store food products over 2 to 4 months, if possible. Use older packages before newer ones and opened packages before unopened ones.
3. When purchasing packaged foods, be certain that containers are not damaged and seals are intact. Check the packaging date to be assured that the food is fresh. Packages with clear plastic or wax paper coverings should be checked for the presence of insects.
4. 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.
5. Storing dried foods in a home freezer will prevent pests from developing.
6. Keep food storage areas clean and do not allow crumbs or food particles to accumulate, as exposed food will attract insects. Cleanliness is also important in areas where pet foods and bird seed are stored.

Management Strategies

The following are suggested procedures for proper management of insect infestations:

Inspection. Using a flashlight or other light source, carefully examine all food storage areas and food products. Be thorough; generally insects are present in foods that are seldom used or in undisturbed storage areas. Don't forget to check pet food and bird seed storage areas.

Discarding infested food items. Dispose of all infested food items; however, the insects should be killed prior to disposal to prevent reinfestation of areas near the disposal sites. Wrap the food items tightly in plastic wrap or bags and place them in the freezer for 3 or 4 days to kill the insects. Do not use heat or microwave treatment prior to disposal because 1) insects can escape during transfer of food products to pans to eventually be put in the oven, and 2) it is often not possible to put the entire package in the oven due to fire hazards.

Thorough cleaning. Remove all food packages, utensils, dishes and other related items from kitchen and

pantry cabinets. Vacuum all spilled and loose food crumbs and particles present in cabinets, on shelves, and in cracks and crevices. Scrub cabinets and storage areas using soap and water.

Freezing Treatment: Insects infesting ornaments and decorations made from plant products or seeds can be killed by placing the items in a freezer for 3 or 4 days.

Insecticide treatment. After thorough cleaning and scrubbing of the food storage areas, an insecticide treatment may be applied, if necessary. Several products are available to control stored product insect pests. When purchasing these products, look for the names of the following insecticides (active ingredients) on the container:

- | | |
|----------------------------|------------------|
| 1. allethrin | 6. phenothrin |
| 2. chlorpyrifos (Dursban®) | 7. pyrethrins |
| 3. diazinon | 8. resmethrin |
| 4. cyfluthrin | 9. sumithrin |
| 5. malathion | 10. tetramethrin |

Insects infesting ornaments and decorations made from plant products or seeds can be killed by placing the items in airtight containers along with aerosol fogs of the insecticides mentioned above. Leave the treated container closed for at least eight hours. Retreatment may be necessary if all insects are not killed. Be careful when using plastic containers, as some chemicals may react adversely with certain plastic containers. Pretesting the container with the insecticide to be used is always a sound practice.

Safety Notes

- READ, UNDERSTAND, AND FOLLOW ALL INSECTICIDE LABEL DIRECTIONS AND PRECAUTIONS.
- Do not restock treated shelves, drawers, and cabinets until the insecticide spray has dried thoroughly.
- Keep all insecticides in their original containers.
- Do not contaminate food and water.
- Keep insecticides out of the reach of children and pets, and do not allow them near treated surfaces until surfaces are dry.

Caution. If insects continue to appear, check other rooms in the home for possible sources. Tree seeds blown into ventilators or around windows may harbor these pests. Dermestids (carpet beetles) will develop in many products such as feathers, silk, wool, fur, stuffed animal skins, dead insects, lint, and many other materials. If insect problems persist, seek assistance from a commercial pest control operator.

Illustrations: Jim Kalisch, Department of Entomology

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