How to Recognize Some Common Insect Enemies of Stored Grain

By M. D. Farrar and W. P. Flint

IF the ever-normal granary is to benefit the people of the United States and not the insect population, owners of stored grain must know how to protect it against the onslaught of these destructive hordes.

Altho all kinds of stored grains are acceptable food to a large number of insects, serious damage to whole grain in Illinois bins and cribs is done by only a few insects. These can be identified with considerable success, even by one relatively unfamiliar with them, by comparing them carefully with the pictures and descriptions in this circular.

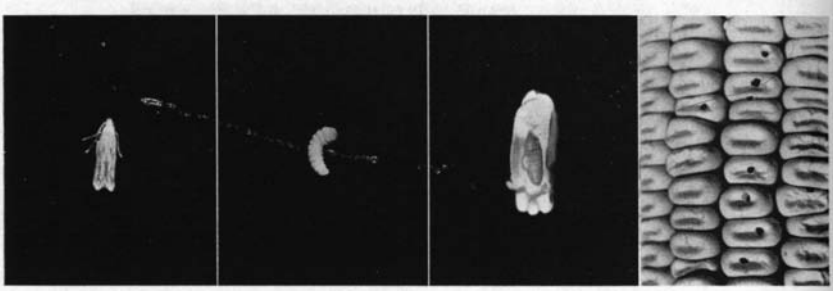
CONTROL MEASURES

. . . . are given in Circular 486, "How to Stop Weevil Damage in Stored Grain." Ask for a copy if you do not have one.

CIRCULAR 497

UNIVERSITY OF ILLINOIS • COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION AND EXTENSION SERVICE IN AGRICULTURE AND HOME ECONOMICS
In cooperation with Illinois Natural History Survey

ANGOUMOIS GRAIN MOTH



Adult	Larva	Pupa	Damage
Mottled gray ¼″ to ⅓″ long	Feeding stage Gray to white Up to ⅓″ long	Changing stage in corn kernel Light brown	Typical exit holes in corn kernel

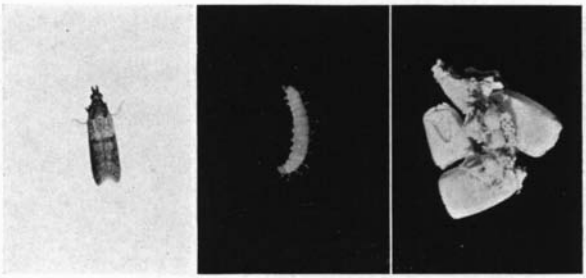
This light-gray mottled moth does more damage to ear corn in cribs than any other insect. It also attacks wheat, rye, and other small grain. Tho found thruout Illinois, it is most destructive in the southern half of the state.

The eggs are deposited on the kernels of wheat or grains of corn by the adult moth. The tiny worms *(larvae)* hatching from the eggs bore into the grain, complete their growth, and go into a resting or changing stage *(pupa);* then finally emerge thru the holes they eat in the grains. They eat out most of the inside of the grain. A brood is matured in about 35 to 40 days. In southern Illinois there may be as many as six broods a year.

Corn, wheat, and other grains in the field are frequently infested, and losses running up to 50 to 75 percent of the value of the cribbed corn are sometimes incurred in the course of a single season in the southern fourth of Illinois.

THE FIRST SIX INSECTS described in this circular—*Angoumois grain moth, Indian meal moth, rice and granary weevils,* and the *lesser grain borer*—are the main threat to stored grain in Illinois. The other five do little damage from feeding, working mainly on broken or cracked kernels of grain; but when present in large numbers they may cause the grain to heat and mold and therefore should be watched. There are other insects that do practically no damage.

INDIAN MEAL MOTH



Adult	Larva	Damage
Light brown banded with chocolate ⅓″ to ½″ long	Feeding stage White to pink Up to ½″ long	Typical webbing in corn kernels

This moth is a common and destructive pest of all kinds of stored grains as well as soybeans, nuts, dried fruits, and many other food products. It occurs thruout the state, laying its eggs on the outside of grains. It is easily identified by the dark chocolate-colored area on the hind part of the wings.

The young worm *(larva)* spins a thread of silk wherever it goes and webs the food material together. It eats out the inside of the grain but does not bore into it. In corn it frequently eats out the germ. On becoming full-grown the larva forms a thin cocoon, goes thru a changing stage, and emerges as a moth.

Broods of this moth mature in about 30 to 40 days, and there may be as many as four to six broods a year. Under warm conditions this insect breeds continuously thruout the year.

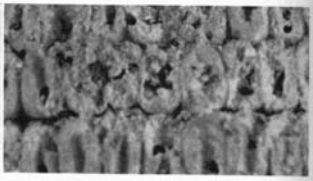
FARMERS WHO FIND in their stored grain insects which they suspect of being among the destructive group—the first six described in this circular—but which they cannot identify with certainty are invited to send specimens for identification to: CHIEF ENTOMOLOGIST, ILLINOIS NATURAL HISTORY SURVEY, URBANA, ILLINOIS.

The insects will be examined without charge and a report made on which treatment can be based.

RICE WEEVIL

Adult
Brown to black
1/8" to 1/4" long

Adult
Side view



Damage
Corn kernels eaten
out by the grub

This small dark-brown snout beetle, slightly smaller than shown here, is the most common grain weevil found in Illinois, and one of the most destructive. It feeds on all kinds of grains, particularly on corn and wheat. It is found thruout the state but is common only in the southern half.

The female insect makes a small hole in the side of the kernel of corn or grain of wheat by biting into the grain with her strong jaws. She then turns around and deposits an egg in this cavity. The footless grub hatching from this egg eats out the interior of the grain, consuming a large part of it. Within this cavity the grub changes to a resting stage and comes out later as an adult weevil.

Under the most favorable conditions there may be a brood of these insects every 30 days. In southern Illinois broods probably average six a year. The insect has wings and frequently infests grain and corn in the field.

GRANARY WEEVIL

Often associated with the rice weevil is a slightly larger and darker-brown weevil which also has a short snout projecting from its head. This is the true granary weevil. It has much the same range and life history as the rice weevil and likewise causes serious damage. The adult cannot fly and does not infest grain in the fields.

LESSER GRAIN BORER

Adult
Brown
1/8" long

Adult
Side view

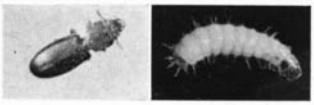
Damage
Wheat kernel completely destroyed

This small cylindrical brown beetle, shown here about twice its actual size, is one of the most destructive of all the beetles feeding on stored grains. Both adults and young feed on the interior of the grain. Where infestation occurs, immediate steps should be taken to clean it up.

In the northern half of Illinois this insect is not so generally distributed as are most of the common grain-infesting insects. Four to six broods a year may be produced.

CADELLE

Adult
Black, 1/2" long



Feeding stage
White tipped with black
Up to 3/4" long

This rather large black beetle is only of moderate importance as a grain pest in Illinois. It is usually associated with the other grain-infesting insects; and while it may become abundant enough to do considerable damage, it will not of itself usually require fumigation.

The adult female usually lays her eggs on the grain next to the bottom and sides of the bin. The white, black-headed larvae feed on the outside of the grain, never boring into it. In wooden bins or cribs they frequently bore into the wood, especially where it is soft or doty.

MEALWORMS

Yellow mealworm
Feeding stage

Light brown
Up to 1" long

While common thruout Illinois, mealworms are of secondary importance as grain pests. They are often found in stored wheat or shelled corn but are of little importance in cribs of corn.

These worms closely resemble wireworms in appearance. They feed on the outside of the grain, being too large to bore thru it. The black adult beetles also feed on the grain. There is probably never more than one brood a year.

SAW-TOOTHED GRAIN BEETLE

Adult
Brown
1/8" long

This tiny brown, very active beetle, shown here about twice its actual size, is not a primary feeder on whole or undamaged grain, but chooses cracked and broken kernels. Both adults and larvae feed on the damaged kernels. Bins of oats and barley, shelled corn, and less frequently wheat, are its principal feeding ground. When present in large numbers, these insects may cause the grain to heat, and it is this that makes them a threat to stored grain.

The larvae are small, thread-like worms about 1/4 inch long when full-grown, and they are found thruout the grain where the adults occur.

This beetle is about as common in northern as in southern Illinois. In the warmer parts of the state it breeds thruout the year, probably averaging two or three broods.

Turning the grain or moving it will usually control this insect; but where infestation is heavy enough to cause heating, fumigation may be necessary.

CONFUSED FLOUR BEETLE

Adult
Reddish brown
¼" long

Feeding stage
Light brown
Up to ⅓" long

This small mahogany-brown beetle is one of the most common insects wherever grain is stored in elevators, mills, bins, or cribs, but fortunately it causes very little damage. Both the beetles and their grayish-colored larvae feed principally on the outside of cracked or broken grain. Two to four broods mature each year.

Turning the grain will usually control this insect. Generally known as "bran bugs," confused flour beetles do more damage in ground feed than in grain stored whole.

FLAT GRAIN BEETLE

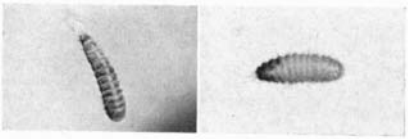
Adult
Light brown
1/16" to ⅛" long

This tiny flat brown beetle, shown here about twice its actual size, infests all kinds of grain and grain products. It is of secondary importance in stored grain. It feeds on cracked grains or broken kernels, not on the entire kernel; and both adults and their small worm-like larvae always feed on the outside of the grain.

This beetle occurs thruout the state, but is rarely of enough importance to warrant fumigation.

CARPET BEETLES

Feeding stage
Dark brown
Up to ½" long



Feeding stage
Brown
Up to ⅓" long

Several kinds of small gray-to-brown, distinctly hairy worms may be found in stored grain or grain products, especially in wheat. These are the young of some of our common Dermestid beetles or, as they are called when we find them in our houses, carpet beetles. These beetles feed on a wide variety of food and animal products and occur in all parts of Illinois in about equal numbers.

Occasionally these beetles become numerous enough in old grain—grain that has been held over for several seasons—to warrant fumigation, but usually they are of secondary importance. The larvae feed on the outside of the grain. Adults feed on the pollen of flowers and are not of any importance as grain pests.

PARASITES OF STORED-GRAIN INSECTS

Adult
Black
1/16" to ⅛" long

There are several kinds of tiny wasps that attack and destroy stored-grain insects, particularly the larvae of the two grain moths (*pages 2 and 3*). One of these wasps is illustrated here magnified to about twice its actual size.

Farmers can be glad when they find these wasps in their stored grain, for it means that there will be less damage from destructive insects.

These wasps are strongly attracted to lights and are frequently to be seen on the windows of cribs or buildings in which grain is stored.

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