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Cereal Leaf Beetle Control
Michigan State University Extension Service
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CEREAL LEAF BEETLE CONTROL

COOPERATIVE EXTENSION SERVICE MICHIGAN STATE UNIVERSITY EAST LANSING

BY RAY L. JANES AND ROBERT RUPPEL

THE CEREAL LEAF BEETLE invaded Michigan about five or six years ago and has been actively controlled since 1961. It is located primarily in southwest Michigan where it is a severe pest of oats. Wheat, barley, and rye are damaged less than oats, but in the tender growing stages of these plants, injury can be considerable. This new pest is spreading.

Description of damage.—Oats are the preferred host. The damage described here is for that crop although the injury on all of its grass host plants is about the same, but less intense than it is on oats. Whole fields may be destroyed by the cereal leaf beetle. Both the adults and larvae (often called grubs or slugs) chew long strips of plant tissue between the veins. The adult usually eats through all of the leaf tissue, while the larva leaves the lower epidermis or skin of the plant leaf intact. When enough feeding occurs, the leaves of the damaged plants turn white at the tips and upon drying turn rust-colored.

Note: This white-tipped condition is, for the most part, a blanching of the color in the leaves. As far as is known, only the cereal leaf beetle of the insect pests of cereals and grasses causes this white-tipped condition. The white-tipping of grass leaves and the black-slime covered larvae are abundant proof that the insect problem is the cereal leaf beetle.

Life history.—The insect has four phases to its life cycle: egg, larva, pupa, and adult. Only the adults pass through the winter, emerging in April to lay eggs. The eggs hatch in about five to ten days. Larvae feed from mid-May until the latter part of June. Pupation takes place the last half of June in cells in the upper two inches of soil. The adults begin appearing in mid-June and feed on tender grasses and corn for about ten days. By mid-July, most of the adults discontinue feeding and seek overwintering sites. These normally move to places under the bark of trees, in cracks in fence posts and logs, in baled hay and straw, and other similar dry, secluded and firm hiding places.

Description of the insect

Eggs.—They are elongate-oval shaped, about one-sixteenth inch long, yellowish when first laid, almost black at hatching. They are laid on their sides on the upper surface of the leaves of host plants.

Larvae.—Mature larvae are about three-sixteenths inch long, hump-backed with brown-black heads and legs, and yellow bodies. The body is usually covered with an "inky" liquid material.

Pupae.—The membranes covering the pupae are thin and transparent. Similar to the eggs, the pupae are bright yellow when first formed and dark-colored like the adults when mature. The soil cells in which the cereal leaf beetle pupates are lined with a secretion which hardened to form a tough-smooth cell.

Adults.—These are three-sixteenths inch long. The head and hard, upper wing covers are metallic-blue-black and the legs and front part of the thorax (just behind the head) are orange-red.

Control

The cereal leaf beetle is controlled by: (1) date of planting cereal crop, and (2) treating with insecticides.

Date of planting

- Plant fall wheat immediately after the Hessian fly-free date for each county. The reasons for this early planting are twofold:
 - Early fall planted wheat (and barley) is more advanced in growth when cereal leaf beetle adults appear in the spring, making the wheat less attractive for egg laying. Normally, the insect prefers laying eggs on young, tender cereals, usually less than six inches high.
 - Early fall planted grains will be larger, and more mature, thereby more able to tolerate feeding by the adults and larvae.

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2. Because the seeding of spring grown cereals is so highly dependent on weather, it is hard to pick a practical planting date that would prevent damage by the cereal leaf beetles. Therefore, chemical control of the cereal leaf beetle is the only good means of preventing damage to spring planted grains.

Chemical control

Sprays applied by ground equipment

In 7 to 15 or more gallons of water, use only one of the following insecticides. Calibrate the sprayer to apply to ONE ACRE the AMOUNT of chemical shown. Note: Before using any insecticide, read the label for instructions on how to apply it.

CARBARYL (Sevin).—2 pounds of 50% wettable powder, or 1 1/4 pounds of 80% wettable powder, or 1 2/3 pints of "flowable" formulation containing 5 pounds of actual chemical per gallon.

Warnings:

- Do not apply after the heads begin to form. (This allows for treating up to the time the tip of the head begins to show.)
- Carbaryl is very toxic to bees. Avoid using it where it will harm them.
- Carbaryl presents no residue problem from drift onto alfalfa, clover, or pastures.

MALATHION.—1 2/3 pints of an emulsion containing 5 pounds of actual chemical per gallon.

Warnings:

- Do not apply within 7 days of harvest of small grains.
- Malathion presents no residue problem from drift onto alfalfa, clover, or pastures.

Sprays applied by aircraft

Because of the danger of contaminating nearby crops with more persistent and highly toxic insecticides, only carbaryl (sevin) and malathion can be recommended for aircraft application for control of cereal leaf beetles.

Apply one actual pound of either insecticide in one gallon of water. Carbaryl is preferred for control of adults in early May and malathion for the larvae at the end of May or the early part of June.

Apply the aircraft treatment at no more than 10 feet above the crop and when the wind is less than 8 miles per hour.

Warning: Use the same warnings for aircraft application of carbaryl and malathion as given for ground equipment.

When to apply treatments

The time to apply the treatment is critical. If the adults are numerous in early May, a spray is needed to protect spring-planted small grains and may be needed for heavily infested, late-planted fall grains. Carbaryl is especially valuable for this early spray as it kills eggs, adults, and larvae (grubs) of the cereal leaf beetles. Malathion can be used but it does not kill the eggs, nor give extended protection against the adults.

On all grains, whether planted in the fall or spring, a treatment will be needed when the larvae are numerous. This usually occurs the latter part of May and the first week of June. Malathion is suggested for this late application as it will give control of other pests, especially aphids (plant lice), as well as the cereal leaf beetle.

Carbaryl may cause an increase in aphids and is not suggested for this late spray when the insects are present in fields.

Dates of appearance of the different stages of the cereal leaf beetle are given in the following table:

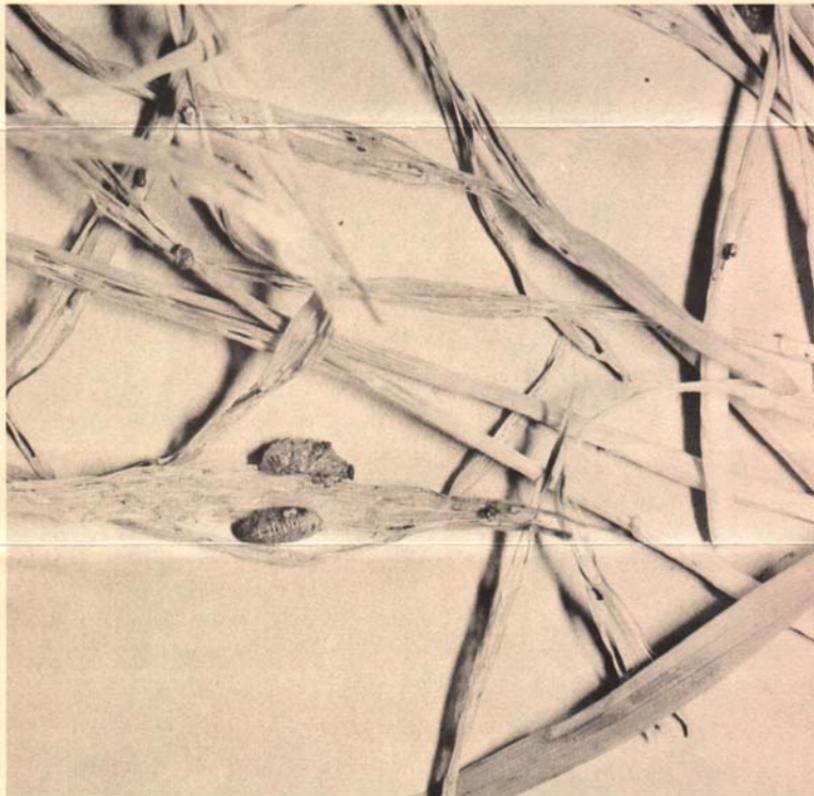
Seasonal appearance and abundance of the Cereal Leaf Beetle on all host crops during 1963 and 1964.

Stage	First Found	Peak Abundance	Last Found
1963			
Spring adults	March 28	April 15 to May 25	July 8
Eggs	April 8	April 20 to May 30	June 17
Larvae	May 2	May 20 to June 11	July 1
Summer adults	June 17	June 24 to July 1	August 15
1964			
Spring adults	March 4	April 23 to May 10	_____
Eggs	April 17	April 30 to June 6	_____
Larvae	May 7	May 15 to June 8	July 15
Prepupae	May 26	June 8 to June 19	_____
Summer adults	June 14	June 19 to July 13	September 22

Note: When applying malathion, air temperatures should be 65 degrees F. or higher; for carbaryl 55 degrees or higher. For the most part, rising temperatures are preferred to falling temperatures when applying these chemicals.

Research and other phases of cereal leaf beetle

control are in progress. Before making a final decision on the insecticide to use for control of the beetle, you may wish to consult your county agricultural extension agent. It is possible that other materials will be registered for this purpose. Also, more information about timing of sprays will be available.



Mature larvae are about $\frac{3}{16}$ inch long, hump-backed with brown-black heads and legs, and yellow bodies. The body is usually covered with an 'inky' liquid material which gives a dark, slug-like appearance. Larval feeding damage consists of long strips of tissue removed from between the veins of the upper surface of grass leaves. Note the small dark-colored larvae.



The adult is $\frac{3}{16}$ inch long. The head and hard wing covers are metallic-blue-black. The legs and front part of the thorax just behind the head are orange-red. Adult feeding damage consists of long strips of leaf tissue completely removed from between the veins.