

CEREAL LEAF BEETLE

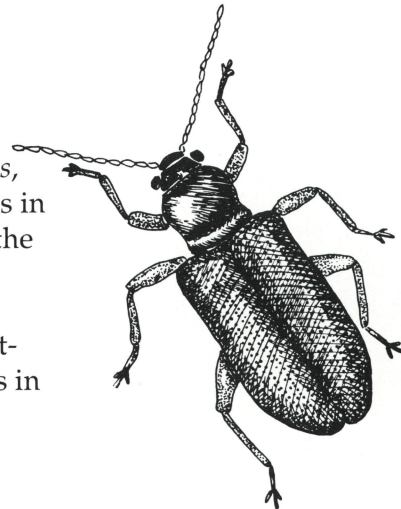
A NEW PEST IN IDAHO

S. C. Parkinson, L. E. Sandvol, M. E. Cooper

CIS 994

History

The cereal leaf beetle, *Oulema melanopus*, has been recognized as a pest of small grains in Europe since 1737. It was first identified in the United States in 1962 in Berrien County, Michigan. Since then it has spread to many states in the East, Midwest, and parts of eastern Canada. The infestation now also occurs in south-central Montana, north-central Utah, and Franklin County, Idaho.



Host plants

The cereal leaf beetle feeds on oats, barley, wheat, rye, and corn as well as weeds, such as wild oats and quackgrass. It also feeds on forage grasses, such as timothy, ryegrass, orchard grass, and reed canary grass. Its preferred hosts are spring-seeded small grains — especially oats and barley.

Adults: The adult beetle is small but easy to identify. It is a hard-shelled insect measuring 1/4- to 3/16-inch long, with a metallic blue head and wing covers, a red pronotum, and yellow/orange legs (fig. 1).

Eggs: The newly laid eggs are elliptical, yellow, and smaller than a pin head (less than 1/16-inch long). Before hatching, they turn almost black. Eggs are laid on their side rather than on their ends. They are never laid in clusters but deposited singly or in rows of up to three or four. Normally they are found close to the mid-rib on the upper surface of the host plant leaf (fig. 2).

Description

Larvae: Mature larvae are slightly larger than adults and look much like slugs. Their skin is yellow or yellowish brown and covered by a mass of slimy, dark, fecal material. This fecal material deposit is thought to protect the larvae from desiccation and predators. It also appears to attract some of the beetle's host-specific parasites. Immediately after a molt is the only time larvae are found without this excrement. A disturbed larva easily casts off this fecal covering. A worker's shoes, pants, and shirts often become covered with this slimy material when working in an infested field (fig. 3).

Life cycle

Pupa: During the inactive stage, the pupae are also yellow to yellowish brown. Pupae are rarely seen because they are encased under the soil surface in earthen cells.

Cereal leaf beetles overwinter as adults in grass stems, debris, under bark, and in the crowns of grasses. In some areas, the beetle has survived in woody or brushy locations, especially areas adjacent to infested fields.

In the spring when maximum daily temperatures reach about 50°F, the adults become active. Full activity (mating and flight) occurs when temperatures reach about 66°F. These adults are active fliers and move around in search of acceptable host plants. Overwintered adults are heavy feeders and will consume up to 3.5 times their body weight in a single day.

Shortly after breaking diapause, the adults mate and begin to lay eggs within 10 days. One female may lay up to 300 eggs.

Eggs take from 4 to 23 days to hatch, depending on temperature. Under southeastern Idaho conditions, hatch normally occurs during the month of May. Larval populations peak mid-to late June. With a warm, early spring, these populations may peak up to 1 month early.

Larvae have a noticeable and unique feeding pattern: they eat the upper layer green mesophyll cells, which create the green color and generate plant energy. They feed down to the cuticle, staying between the leaf veins. This feeding pattern gives the leaves a "frosted" appearance when viewed from a distance. This distinctive feeding pattern is characteristic of the cereal leaf beetle, and is one way of detecting its presence (fig. 4).

After 10 to 14 days and three to four instars, the mature larvae pupate in the small, hardened, mucous-lined cells they have constructed in the soil. The pupal stage requires from 10 to 21 days depending on environmental conditions.

The newly emerged adults feed on a variety of material, but prefer succulent grasses, grain, and young corn. Even though their numbers can reach several hundred per plant, the adults rarely cause economic damage because they feed for such a short time.



Fig. 1. Adult beetle.



Fig. 2. Egg.

Quarantine situation

Adult feeding is characterized by eating entirely through the leaf surface. Adults eat between the leaf veins, staying in a straight line. This produces a stripping effect instead of the frosted appearance created by larvae.

After about 2 weeks of feeding, the adult goes into a resting stage. Toward fall, these adults seek shelter and become quiescent until the following spring. The cereal leaf beetle has only one generation per year.



Fig. 3. Larva.

California has imposed quarantines on products from the infested areas to prevent this insect from spreading. Current quarantines involve barley and wheat hay, and grain. Please consult with the Idaho Department of Agriculture or the University of Idaho Extension agricultural agent in your county to determine the current quarantine status.

Control



Fig. 4. Damage caused by larva.

The economic threshold is based on insect population densities and maturity of the grain crop. Do not spray cereal crops unless populations reach three larvae per plant, three eggs per plant, or both. When counting populations, be certain to include all the tillers in each plant. It is best to take several samples by walking a wide circle through the field. Take 10 to 20 sample counts to ensure accuracy.

After boot stage, the economic threshold becomes one larva per flag leaf. If control is required, consult the current edition of the *Pacific Northwest Insect Control Handbook* (to order, see page 4).

Biological control

A concentrated effort by state and federal agencies the past several years has produced a successful parasite introduction program in the midwestern and eastern United States.

Several species of parasitic wasps have been used in this biological control program. Once these parasites become established in an area, they typically reduce beetle populations about 60 percent and grain losses to less than 1 percent without chemical control.

Presently the United States Department of Agriculture, Idaho Department of Agriculture, and University of Idaho are working together to establish a parasite release program in Idaho. This release program will be implemented during the next several years.

Even with the establishment of parasites, the cereal leaf beetle continues to spread to new areas. In areas where the parasites can be introduced, chemical spraying is usually limited to protecting small grains from a beetle infestation. Farmers should attempt to limit spraying in these areas to protect the growing parasite population. Limited spraying may be necessary for 3 to 5 years so the parasites can increase their numbers and reduce the beetle population to a level that does not seriously reduce yields.

Cultural control practices that reduce populations of cereal leaf beetle have not been identified.

Authors: Stuart C. Parkinson, University of Idaho Extension agricultural agent, Franklin County, Preston; Larry E. Sandvol, Extension entomology specialist, Aberdeen Research & Extension, University of Idaho Department of Plant, Soil, and Entomological Sciences; Michael E. Cooper, Bureau of Feeds and Plant Services, Idaho Department of Agriculture, Boise.

To order the *Pacific Northwest Insect Control Handbook*, send \$19.50 (includes postage charges) to: Ag Communications, Publications Order Department, Oregon State University, Corvallis, OR 97331-2119.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, LeRoy D. Luft, Director of Cooperative Extension System, University of Idaho, Moscow, Idaho 83844. We offer educational programs, activities, and materials without regard to race, color, religion, national origin, gender, age, or disability, in accordance with state and federal laws.