



# Cereal Leaf Beetle

*Oulema melanopus* (L.) (Coleoptera: Chrysomelidae)

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The cereal leaf beetle (CLB) is an imported insect pest from Europe. It was first detected in Michigan in 1962, Utah in 1984, and Montana in 1989. Cereal leaf beetle was first detected in **Williams and McKenzie counties of North Dakota** in June 2000. The cereal leaf beetle can be a serious pest of wheat and barley. Both adults and larvae of the cereal leaf beetle damage grain crops by feeding on the leaves. The larvae are the most damaging stage and the target of control measures. Generally the CLB prefers newer plant tissue. Feeding typically occurs on the upper leaf surface and is characterized by elongated slits.

## DESCRIPTION



FIGURE 1. ADULT CLB.



FIGURE 2. ADULT FEEDING DAMAGE.



FIGURE 3. CLB EGGS ON WHEAT LEAF.

**Adult** —  $\frac{1}{4}$  inch long with brightly colored orange-red thorax, yellow legs and metallic blue head and wing covers.

**Damage** — The first sign of CLB activity in the spring is adult feeding damage on the plant foliage. Adult injury is characterized by elongated, slender slits in the upper leaf surface.

**Eggs** — The eggs are laid end to end, singly or in groups of two or three on the upper leaf surface near the base of the leaf. Newly laid eggs are bright yellow, darkening to orange-brown and finally to black before they hatch. Egg hatch may take from four to 23 days depending on temperature.



FIGURE 4. CLB LARVA - WITHOUT COATING.



FIGURE 5. CLB LARVA - WITH SLIMY, BLACK COATING.



FIGURE 6. CLB LARVAL FEEDING.

**Larva** — The larva has a light yellow body with brown head and legs. They have three pairs of legs located close to the head end. The body is protected by a layer of slimy fecal material which makes them look like a slug. When working or walking in an infested field the slimy covering will rub off on your clothing. Although both adults and larvae cause feeding damage, the larvae are responsible for the majority of the damage. They feed on the leaf surface between veins, removing all the green material down to the lower cuticle, resulting in an elongated windowpane in the leaf. Severe feeding damage gives the field a frosted appearance.

## HOST PLANTS

Cereal leaf beetle has a wide host range including the cultivated grass hosts barley, oats, wheat, and rye. Adults may feed on corn, sorghum and sudangrass. Beetles may feed on grass weeds including wild oats, quackgrass, timothy, canary grass, reed canary grass, annual and perennial ryegrass, foxtail, orchard grass, wild rye, smooth brome and fescues.

## MONITORING

In spring, inspect plant foliage for adult feeding injury, the first sign of CLB activity. While this is the first sign of infestation, it is CLB larvae that are the target of control. Eggs and larvae are monitored by inspecting individual plants. Thresholds are expressed as egg and larval numbers per plant or per stem. To determine infestation levels, examine 10 plants per location; select at least five locations in a field, more for larger fields. Count the number of eggs and larvae per plant (small plants) or per stem (larger plants) and determine an average number of eggs and larvae based on the samples you have taken.

Plant growth stage should be noted, because the treatment threshold changes with plant growth stage. Both eggs and larvae can be found by examining the upper leaf surface.

## INSECTICIDE

### REGISTERED INSECTICIDES FOR MANAGING CEREAL LEAF BEETLE

Insecticide	Rate (lb a.i./acre)	Rate (product/acre)	Notes
<b>FOR WHEAT, BARLEY, AND OATS</b>			
Furadan 4F <i>RUP</i>	0.25	0.5 pt	Applications must be made prior to the heads emerging from the boot. This is a 2 (ee) recommendation.
Lannate L <i>RUP</i>	0.225 - 0.45	0.75 - 1.5 pt	24 hrs to re-entry. 7 days to grain. 10 days to graze.
Malathion 5EC	0.6-1.25	1 - 2 pt	7 days to grain or graze
Malathion ULV	0.3-0.6	4 - 8 oz	7 days to grain. Most effective at temperatures over 70°F.
<b>WHEAT ONLY</b>			
Mustang <i>RUP</i>	0.022-0.05	1.9-4.3 oz	14 days to grain, forage, and hay. Do not apply more than 0.25 lb ai per season.
Sevin (XLR Plus,4F, 4-Oil)	1.0	2 pt	21 days to grain. 0 days to feed.
Sevin 80S	1.0	1.25 pt	21 days to grain. 0 days to feed.
Warrior <i>RUP</i>	0.02-0.03	2.56 - 3.8 oz	30 days to grain. Do not apply more than 0.06 lb ai (7.68 oz) per season.

*RUP - Restricted use pesticide*

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## ECONOMIC THRESHOLD

Cereal leaf beetle feeding damage can reduce yield and grain quality. The boot stage is a critical point in plant development. **Before boot stage**, the threshold is three eggs and larvae or more per plant, including all the tillers present before flag leaf emergence. Larval feeding during early growth stages can have a general impact on plant vigor. When the flag leaf emerges, feeding is generally restricted to the flag leaf. Damage to this leaf can significantly reduce grain yield and quality. **At the boot stage**, the threshold is one larvae or more per flag leaf.

## MANAGEMENT

### NATURAL CONTROL

Lady beetles prey on CLB larvae. Several imported parasitic insects attack CLB, but these parasites have not been determined to be present in North Dakota. The parasites imported from overseas and established in some areas of the U.S. include *Anaphes flavipes*, a wasp that parasitizes CLB eggs; *Tatrastichus julis*, *Diaparsis carinifer*, and *Lemophagus curtus*, wasps that parasitize larvae; and, *Hyalomyodes triangulifer*, a tachinid fly that parasitizes adults. CLB have been reduced to a minor insect pest of small grain crops in areas where the parasites have been successfully established.



For more information on this and other topics, see: [www.ag.ndsu.nodak.edu](http://www.ag.ndsu.nodak.edu)

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