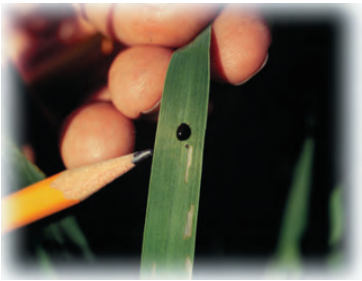
Cereal Leaf Beetle: Biology and Management

Cereal leaf beetle, a native to Europe and Asia, was first detected in Michigan in 1962. Since that time it has spread throughout most of the mid-western and eastern United States and has become a significant pest of Virginia and North Carolina small grains. This insect can become very numerous in small grain fields and the larvae are capable of reducing grain yield by eating the green leaf tissue.

Description

Adult beetles are about 3/16 inch long and have metallic looking, bluish-black heads and wing covers. The legs and front segment of the thorax are rust-red.



Adult cereal leaf beetle

Cereal leaf beetle eggs

Eggs are elliptical, about 1/32 of an inch long, and colored yellow to burnt orangish yellow. Most often the eggs are laid singly or end-to-end in short chains on the upper leaf surface between, and aligned with, the leaf mid vein.

Larvae are slug-like, have orangish yellow bodies with heads and legs that are brownish-black.

Larva on leaf

Cereal leaf beetle larvae

However, body coloration is usually obscured by a black globule of mucus and fecal matter held on the body, giving them a shiny black, wet appearance.

Life Cycle

Adults:

- Adults overwinter in fallen leaves, ground litter, or other debris, within wooded areas, or other protected sites in the vicinity of last season's grain fields.
- In the spring, they lay eggs in small grain fields.

Eggs:

- Egg laying occurs during late-March through mid-April with adults preferring late-planted and thinly sown fields.

- Eggs hatch in about five days.

Larvae:

- Larvae develop in 10 -12 days.
- Peak larval populations occur in mid-April to early-May.
- Small larvae eat a very small amount, but when full grown have a voracious appetite.
- Upon reaching full size, they dig into the ground and pupate.

New Adults in Corn:

- After a short period in the soil, a new summer generation of adult beetles emerges in late-May and June.
- New beetles move from small grain fields and feed on grass plants, including corn in fields adjacent to the small grain fields.
- Adult feeding on corn appears like many line-etchings on the leaf blades. Damage is cosmetic rather than yield reducing.
- Adults do not lay eggs in corn.
- They remain inactive through most of the summer.
- In the fall, beetles move to overwintering sites.
- There is only one generation per year.

Adult damage to corn leaves

Damage

Damage to leaves:

Although adults will feed on young small grain plants, their feeding does not affect the plant's performance. Larvae eat long strips of green tissue from between leaf veins and may skeletonize entire leaves, leaving only the transparent lower leaf surface tissue.

Larva removing green layer from leaf

Damage to fields:

Severely defoliated fields can take on a white "frosted" cast when lots of green tissue is lost on the upper leaves.

Yield reduction:

- Leaf feeding reduces the plant's ability to make its food and limits reproductive growth, particularly if the upper leaves are destroyed.
- Yield reductions of 10% to 20% are typical in infested commercial fields.
- Yield reductions of 45% have been observed when defoliation was near 100% and the damage occurred early in the heading period.
- Damage late in the head-fill period does not have a great impact.

Field severly damaged by cereal leaf beetle

Management In Wheat

Non-chemical Control:

- Where Hessian fly has not been a problem, avoid late planting.
- Manage for thick planted/tillered wheat.
- Follow sound agronomic practices for high yielding wheat.
- Parasites can be effective but where beetle populations exceed threshold consider insecticide treatment.

Insecticidal Control:

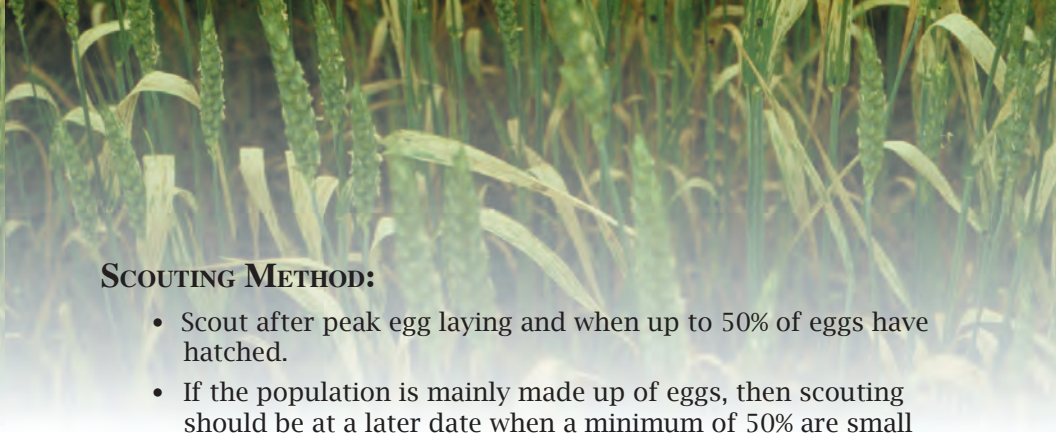
- Cereal leaf beetles are easily controlled with low rates of several insecticides (consult the VCE Pest Management Guide, NC Agricultural Chemical Manual or your local Extension Office).
- When selecting insecticides, consider the presence of aphids and armyworm since certain insecticides are better choices for unique pest combinations.
- Cereal leaf beetle has only one generation per year and if
- insecticide is applied correctly, one application will give adequate control.
- Insecticides can be tank mixed with other materials such as fungicides if the timing of the two treatments coincides.

Precaution — It is not advisable to add an insecticide to early top dress nitrogen applications. If insecticide is applied too early in the season, it will likely fail to control cereal leaf beetles and can actually increase numbers by removing predtors.

New Economic Threshold:

25 eggs and/or larvae total per 100 tillers

- The new economic threshold is based on the number of eggs and small larvae present, rather than large larvae.
- Proper use allows fields at risk to be identified and treated in time to prevent significant yield loss.
- Eggs and small larvae are easy for growers and scouts to locate on leaves in the spring, and the sampling system (see below) is relatively easy and time-efficient.



Scouting Method:

- Scout after peak egg laying and when up to 50% of eggs have hatched.
- If the population is mainly made up of eggs, then scouting should be at a later date when a minimum of 50% are small larvae.
- Samples should be taken at a minimum of 10 random sites in the interior of each field (avoid the edges).
- At each site, 10 tillers (stems) should be examined for eggs and larvae. This will result in 100 tillers (stems) per field being examined.
- Eggs may be on the leaves near the ground. Record the number of eggs and larvae counted at each sample site.
- After leaving the field, calculate the total number of eggs + larvae found.
- Alternatively, stems can be examined at random while walking through the major portion of the field; again 100 stems per field should be examined.

Because cereal leaf beetle is often unevenly distributed in the field, it is often necessary to determine if a portion of a field is above threshold. If the random sampling indicates an uneven distribution (lots in some samples but few in others), it may be necessary to subdivide the field into two or more parts and sample each part as an individual field. In instances of very high counts, the sampling can be abbreviated after the samples have exceeded the threshold- for instance, if after examining 30 tillers the scout has found 35 eggs + larvae, which exceeds the threshold for 100 stems. However, if this is done, the scout should realize that the portion of the field not scouted may not have high populations.

Scouting Frequency:

- Once egg laying has reached a peak, many fields will need only a single scouting for eggs and larvae.
- If the proportion of eggs in the sample is 50% or greater, then sample again in 5-7 days.

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Biology & Management

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