

Inside Grundy County
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Corn Rootworms Control for 2010?

Dr. Erin Hodgson, ISU Extension entomologist spoke to a full room at the Crop Advantage conference held in Waterloo. The discussion was on corn rootworms. Some growers mentioned they had problems with controlling this pest last year. So what kind of corn rootworms do we have in Iowa?

There are two major corn rootworm species in Iowa, the most common being the northern corn rootworm *Diabrotica barberi*, followed by the western corn rootworm, *D. virgifera virgifera*. Every so often, the southern corn rootworm *D. undecimpunctata howardi* Barber may be found but since it does not successfully overwinter, it is not often considered an economic threat. These corn pests are members of the insect family, Chrysomelidae, commonly known as leaf beetles. They are native species, first recorded in 1824.

Adult northern corn rootworm beetles are about ¼ inch long, solid yellowish green (tan when newly emerged). Western corn rootworm beetles are about the same size and color, but have three dark stripes on their wing covers. There is typically one generation per year. Adult corn rootworms emerge from soil between July and mid-August, depending on weather conditions. After emergence, the eggs of adult females mature in two weeks. The female deposits 75 percent of her eggs over a period of 30 to 35 days and may live as long as 80 days and deposit more than 1,000 eggs.

Both species of rootworm prefer to deposit their eggs in cornfields. Females deposit most eggs near the base of corn plants, within the top six inches of the soil surface and Western corn rootworm females may deposit their eggs throughout the field. Small holes and cracks in the soil give the females access to areas below the soil surface.

The eggs overwinter until spring. The eggs of both species must be exposed to a period of cold before larvae can hatch.. This physiological requirement is known as *diapause* . Eggs often hatch anytime from late May into June and the larvae begin to feed on roots. The larval stage lasts four to six weeks, followed by pupation. Adults begin to emerge five to ten days after pupation and feed on leaves and corn silks. The feeding on silk by adults, know as silk clipping, can sometimes cause economic damage.

But it's the larva stage that typically does the most economic damage. Root feeding restricts water and nutrient movement in the plant and can cause lodging, making harvest difficult and causing losses. But the biology of these pests has changed. There is a population of the northern corn rootworm that has extended diapause. This means eggs hatch two years later instead of the following year. One of the most common ways to control corn rootworms is through a typical Midwest crop rotation of corn followed by soybeans. Since corn rootworm larvae don't feed on

soybean roots, they would die, but not so with extended diapauses. This extended diapause is now found throughout the northern two-thirds of Iowa.

There is also the western corn rootworm variant whereby the female lays eggs in soybean fields. When the field is planted to corn the following year, the larva begin feeding on its' roots. The good news is that this variant, if in Iowa, is found primarily in counties along the Mississippi. The bad news is that it is most experts believe it's just a matter of time before it arrives here.

In the past farmers used a soil-incorporated insecticide to control rotations when corn followed corn. Some insecticides performed better than others according to university research trials. Then came the development of hybrids with a Bt rootworm resistance. These varieties outperformed insecticide products in many research trials, especially in dry years.

Occasionally, we hear that some farmers had fields using either insecticides or the rootworm resistance and still had corn rootworm damage. Since no one knows exactly what happened, all we can do is speculate and Extension is not in the speculation game. So what do we do for 2010?

The corn rootworm research shows that the Bt corn rootworms event provided the greatest control in regards to the amount of roots nodes eaten. We consider corn rootworm to be economically damaging if more than a ¼ root node is eaten. The Bt events consistently show less nodes eaten. But there is always the concern of resistance developing within the rootworm population. To reduce that risk, farmers are required to plant a refuge (% of corn acres) with a susceptible variety or non-Bt rootworm event. This is extremely important that farmers follow this requirement.

What about the western variant? Traps in Butler County found only one western corn rootworm beetle variant in 2009. When this pest arrives, educational events will occur to discuss control options. The extended diapauses damage is difficult to predict. Typically, damage occurs on about 10 to 15% of corn acres if the extended population is present. The damage will also vary from year to year in different parts of the field. In the past it has not been considered economical to control this pest if only a small percent of plants are damaged. That could change depending on the value of the crop. For more information, see the ISU Corn Rootworm Home Page at <http://www.ent.iastate.edu/pest/rootworm/>