

INSECT MANAGEMENT WITH CONTINUOUS CORN

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As commodity prices continue to fluctuate, some grain producers have placed a portion of their acreage in continuous corn rather than a corn-soybean or corn-wheat-soybean rotation. However, the risk of yield losses due to damage from some insects, particularly corn rootworm, increases the longer that fields are kept in continuous corn. With other insect pests such as corn borers, black cutworm, fall armyworm, and corn leaf aphids, crop rotation is *not* an important factor.

Corn Rootworm in Kentucky

Corn rootworm has been a pest of minor importance in western Kentucky the past few decades because of crop rotation. Unlike the rootworm problems in first-year corn that have been experienced in north central Illinois and Indiana, corn rootworm in Kentucky is only a problem in continuous corn. In central Kentucky, where on-farm demand for corn compels producers to grow corn after corn, corn rootworm is more of a problem.

In order to complete their life cycles, the western and northern corn rootworms in Kentucky require continuous corn. With both beetles, the eggs are laid during the middle of the summer in corn fields. Females beetles crawl down cracks in the soil at the bases of corn stalks and lay to lay eggs. The eggs remain dormant for the remainder of the summer, fall and winter. They hatch in late spring the following year. The young larva must move through the soil to find corn roots to feed on and they only feed on corn roots and a few grassy weed species. But the young larvae are not very mobile and can only move a short distance, less than a yard to find corn roots.

Soil type can influence the degree of rootworm infestation. Adults prefer sites with large soil particles and cracks and moisture for egg-laying. More eggs will be laid in moist soil than in dry soil. Rootworms are generally not a problem in muck soils or sandy soils. Tillage is also an important factor. In side by side comparisons at UK, less damage is observed in no-till corn.

However, economic damage can still occur in no-till.

Once the rootworms find corn roots, they feed near the crown of the plants. Infested root tips appear brown, are often tunneled and may be chewed back to the base of the plant. Larvae may be found tunneling in larger roots and occasionally in the plant crown. Reduction of the root system, especially the lateral roots, results in lodging. Severe lodging increases yield loss at harvest. In addition, pruned roots place physiological stress on the plant by reducing water and nutrient uptake. This can reduce yields, especially when coupled with low moisture or poor fertility.

Development from egg to adults takes about one month. The adults beetles emerge in early July and are active through August. Corn rootworm beetles feed on fresh corn silks or pollen, and leaf tissue of corn that has not tasseled. Late maturing corn is especially attractive and beetles may congregate there when short season corn stops producing pollen.

The 'Soybean' Variant

Several years ago, a new problem arose with western corn rootworm in first-year corn in north central Illinois and Indiana. Rather than lay their eggs in corn fields, these move to soybean fields to feed and lay eggs. The following year when the field is used for corn production, rootworm injury occurs. This has forced many growers to use soil insecticides at planting in first year and continuous corn in these areas. This soybean variant has spread eastward and northward, but is not currently a threat in Kentucky.

Monitoring for Rootworm Beetles

Growing corn continuously in the same fields increases the potential for rootworm damage but does not automatically mean problems will develop. Field visits from mid-July through mid-August provide valuable information for determining the need for a soil insecticide the following year. Watch very carefully when green

silks are present. If the average number of beetles found per plant is less than one, then economic problems are not likely the following year. If one or more rootworm beetles are found per plant, then a control measure (crop rotation or soil insecticide) should be considered.

Rootworm Management

1. Crop rotation. This is still the most effective and economical way to manage corn rootworm in Kentucky.

2. Monitoring. If rotation is not an alternative the producers should monitor field to determine the need for a soil insecticide at planting.

3. Soil Insecticides. Several soil insecticides provide adequate control of corn rootworm. Producers have granular (Force, Counter, Lorsban, Aztec, Fortress) and liquid alternatives (Regent, Furadan, Capture). These are used preventively, once symptom of damage begin to occur, no rescue treatment is available.

4. Corn Rootworm Bt Corn? Several corn companies are seeking USDA, EPA, and FDA approval for new types of Bt corn that are resistant to corn rootworms.

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