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**Corn rootworms are here!**

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Corn rootworms are here!

Abstract
For those of us that work with corn rootworms, the most exciting time of the year has arrived. Larval injury has reached its maximum and the beetles are emerging. The first beetles that I saw this year were in east central Iowa on July 1. Usually when I return from the July 4th weekend, someone will call reporting that they saw a beetle over the holiday. This means that beetle emergence began about a week earlier than normal. Last year, rootworm development was at least a week behind average. Consequently, rootworm events will be about two weeks earlier this year than they were last year.

Keywords
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The first beetles that I saw this year were in east central Iowa on July 1. Usually when I return from the July 4th weekend, someone will call reporting that they saw a beetle over the holiday. This means that beetle emergence began about a week earlier than normal. Last year, rootworm development was at least a week behind average. Consequently, rootworm events will be about two weeks earlier this year than they were last year.

When adult corn rootworms begin to emerge from the soil, the majority of larval feeding on the roots has been completed. Most of the rootworms are in the pupal stage, a few have transformed to adults, and most of the remaining larvae are nearing the end of their feeding activity. This is an ideal time to evaluate the performance of soil insecticides. As the larval feeding ends, injured roots will begin to branch above the feeding point and soon the bushy, secondary-root development will hide the damage. To evaluate insecticide performance, dig several roots at points throughout a treated field, wash off the soil, and inspect the roots for injury. If only one to a few roots, on average, have been chewed back to within 2 inches of the plant, the protection provided by the soil-applied insecticide was adequate.

Although rootworm larvae cause the most injury to corn, the adults can reduce yields as well. Adults damage corn by feeding on the silks before they are pollinated, reducing seed set. Usually, pollination occurs before enough beetles have emerged to seriously interfere with pollination; however, this may not be true in some cases this year. Where earlier-than-normal beetle emergence coincides with delays in pollination, either because wet weather delayed planting or saturated soils slowed growth, insecticide treatments to control beetles might be warranted. If pollination is in progress and the beetles have chewed back the silks so that less than a 1/2 inch of the silks is exposed beyond the husks, beetles should be controlled.

The appearance of the beetles also alerts those that scout rootworms that it is time to begin sampling. The simplest way of estimating the rootworm threat to next year's corn is to count the number of beetles on this year's plants. An estimate may be made with acceptable
accuracy by counting beetles on two randomly selected plants at each of 27 sites throughout a field. The plant is sampled by holding the silks shut with one hand while the leaf surfaces are examined for beetles. Use the other hand to pull the leaves away from the plants so beetles behind the leaf sheath can be counted. When the plant surfaces have been inspected, the silks may be released and examined for beetles feeding in the ear tip. If there are more than 0.75 beetle per plant in continuous corn or 0.4 in first-year corn, it is likely that there will be economic larval injury the following season if corn is planted in that field. Larval injury can be avoided by planting a crop other than corn or by using an insecticide to protect the corn roots.

Some growers opt to manage corn rootworms by controlling beetles before the females lay their eggs in a field. The number of beetles should be used to determine the need for control measures. The efficiency of beetle management can be improved, however, with an additional piece of information. If treatments to control beetles are not applied until egg laying begins, the residual of the chemicals can be maximized.

To determine the proper timing, female beetles should be distinguished from males and the females squeezed until they burst to determine if they contain eggs. When a beetle is held by the front of the body and pressure gradually applied from the front to the rear, the sex organs will be squeezed out of the insect. The female's egg-laying apparatus (ovipositor) will extend straight back out of the abdomen and, when fully extended, sacks will inflate up and down from the ovipositor to form what looks like a capital "T" from the side. The male sex organ will be a simple tube that extends down (toward the underside) of the beetle. If the beetle is a female and pressure continues to be applied, the abdomen will rupture and clusters of creamy white eggs will erupt from the abdomen. As soon as 1 in 10 females contain eggs, an insecticide should be applied. Sampling must continue after insecticides are applied to verify that beetle numbers were reduced below the threshold and that the numbers remain low for the remainder of the summer. If beetle emergence and movement cause the numbers to exceed the threshold again, additional beetle treatments are needed or controls should be implemented to protect next year's crop.

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