

MONITORING CORN ROOTWORMS IN SOYBEANS

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Introduction

Crop rotation has long been considered an excellent method of cultural control for corn rootworms. Although this statement may still be true in Wisconsin, problems have recently surfaced in the Midwest with regard to western corn rootworm (WCR) management. WCR damage to first year corn was first noticed in east-central Illinois from 1987-1992. Initially, this damage was suspected to be the result of the repellency effect of synthetic pyrethroid insecticides used in seed corn fields. The hypothesis was that WCR adults were being repelled to nearby soybean fields for egg laying.

Unfortunately, frequency and severity of damage to first year corn had increased and many of the newly affected fields were not near seed corn fields treated with a pyrethroid insecticide the previous year. Extended diapause was ruled out because emergence cages placed over infested first year corn fields showed all beetles were WCR and eggs collected from these females hatched after one winter. Damage was first verified in 1997 in northwestern Indiana and has been found in southern Michigan and northwest Ohio in 1998 and Northeast Iowa in 1999. Damage had been found as close as 30-40 miles from the Illinois/Wisconsin border.

A change in egg laying habits of the female WCR has now been confirmed. Historically, female rootworm would lay eggs only in cornfields. However, in an apparent adaptation to a two-year corn/soybean rotation, eggs are now being deposited in soybean fields. Although adult feeding on soybean leaves is noticeable, the damage is not considered economic. This adaptation of the western corn rootworm to a corn/soybean rotation is commonly called the "eastern variant of the western corn rootworm".

Monitoring Program

A monitoring program is currently being developed and refined for WCR egg laying in soybeans. The intent is to monitor adult activity in soybeans and predict the need for a soil insecticide in corn the following year. Pherocon AM unbaited yellow sticky traps are placed in the interior of a field and in a grid-shaped pattern at a rate of 12 traps/field. These traps are a visual attractant and the sticky material on the trap's surface captures adult rootworms. Traps should be in place during the egg laying period (early to mid-August to early September), checked and replaced at weekly intervals. Three counties were selected for a Wisconsin monitoring program in 1998 (Rock, Columbia, Grant) and two counties in 1999 (Rock and Dodge). Rock County was selected each year because of the high frequency of a corn/soybean rotations.

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1998 Wisconsin Trapping Results

All 1998 trap catches were extremely low (Range 0 – 0.33/trap/day). Established economic thresholds suggest that 2 beetles/trap/day and 7 beetles/trap/day would equal root ratings of 3 and 4, respectively, according to the Iowa State 1-6 Root Rating Scale. These trap catches do not prove or disprove the eastern variant exists in Wisconsin. To gain better insight, soil samples were taken from each field. Results of these samples show that rootworm eggs were not present..

1999 Wisconsin Trapping Results

Because of the low beetle catches in 1998, trap monitoring was scaled back to 2 Dodge County fields and 5 Rock County fields in 1999. Average trap catches for the duration of the trapping period ranged from 0.47 and 0.09 in the Dodge County fields. Rock County trap catches were higher and ranged from 0.40 to 3.3/trap/day. However, one weekly trap catch in Rock County averaged as high as 6.88 beetles/trap/day. Soil was taken from each field but corn rootworm eggs were not found.

Discussion .

Rootworm beetle activity was generally higher in 1999 than in 1998 and could be the reason for the higher trap catches rather than an increase in frequency of the eastern variant in Wisconsin. As mentioned previously, the range of the eastern variant has increased in other states but we have not yet confirmed its presence in Wisconsin. However, over the years we have heard of and/or investigated rootworm damaged first-year corn fields after soybeans, and even alfalfa. Most recently we have had reports of damage in a few first year corn fields located in Green and Kenosha Counties. We will be monitoring these areas next year and hope to get more data. Please report any suspicious fields to your local county extension agent and/or one of the authors.

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