SOUTHEAST WISCONSIN VARIANT WESTERN CORN ROOTWORM TRAPPING NETWORK

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Introduction

In the past, corn rotated annually with soybeans or another non-host crop was not susceptible to WCR larval damage because the adult beetles only laid their eggs in cornfields. Larvae that hatched from eggs laid in the previous cornfield could not survive on soybean roots and would consequently starve to death. Thus, corn-soybean crop rotation was the most reliable and safe method for managing corn rootworm. In 1993, the incidence of WCR larval damage in corn planted after soybeans increased dramatically in east-central Illinois, most likely as a response to prolonged rotation between only corn and soybeans. In 1995 and 1997 the damage caused by WCR to first-year corn was noted as severe and prevalent in east-central Illinois (Spencer et al., 1998, numerous other reports). Since then, the variant WCR has spread to other parts of the eastern corn belt and researchers have determined that there is a variant strain of WCR that preferentially lays its eggs in soybean in anticipation of corn the following spring during egg hatch (O'Neal et al., 1999).

Program Overview

The 'eastern variant' of the western corn rootworm (WCR), *Diabrotica virgifera virgifera*, is an emerging pest for Southeastern Wisconsin farmers. The variant lays eggs in soybean fields in anticipation of corn the following year. Routine use of rootworm insecticides for first-year corn without scouting to determine variant WCR activity can increase production costs, have negative environmental impacts and expose farm workers to pesticides in the absence of the pest. Conversely, failure to treat in the presence of threshold levels of variant WCR can result in economic damage. Farmers in southeast Wisconsin suspect that the WCR variant has migrated from east-central Illinois.

In 2003, individual monitoring efforts coalesced in the *Southeast Wisconsin Variant Western Corn Rootworm Trapping Network.* Objectives were to delineate the geographic range of variant WCR and validate University of Illinois treatment thresholds in

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Wisconsin. We surveyed 40 corn and soybean fields, respectively, from eight southern Wisconsin counties for rootworm damage in first-year corn and adult beetle activity in soybean. Our network of *UWEX* agents, producers, *UW* outreach programs and industry crop advisors identified counties of concern through this initial effort. Our current focus is to inform producers about affected areas and provide education on IPM scouting and treatment decision support going into the 2004 season.

Procedure

In July 2003, *UWEX* agents, specialists, corn-soybean producers and industry crop advisors from Columbia, Jefferson-Waukesha, Green, Rock, Walworth, Racine and Kenosha Counties coordinated a trapping network to evaluate whether the "eastern variant" WCR has moved into Wisconsin from northeastern Illinois. During the first week in August 2003, a set of 12 yellow Pherocon AM sticky traps were placed in each of 40 soybean fields selected for the study. Traps were counted (total WCR beetles per trap) and changed at 7 to 10 day intervals through early September.

The economic threshold established by the University of Illinois is 5 to 10 WCR beetles per trap per day (B/T/D), calculated over the entire trapping period. [http://www.ipm.uiuc.edu/fieldcrops/insects/westerncornrootworm/index.html]. At this density range, expected larval root feeding damage to the next year's corn crop would result in a 0.25- to 1.00-root damage rating. These numbers indicate between 25 and 100% of a full node (circle of roots) pruned to within 1.5 inches of the stalk by WCR larvae.

In 2004, team members will return to the same 40 fields, when the fields will be planted to corn, and systematically evaluate root damage to compare with WCR beetle trap data from the 2003 soybean year. We will develop statistical correlation to validate the University of Illinois sticky trap thresholds under Wisconsin conditions and determine the impact of variant WCR activity in affected counties.

Preliminary Results

From our study and sample size, the only counties in which we detected fields at or above the lower threshold of 5 B/T/D were Walworth, Racine and Kenosha Counties. The remaining counties in our 2003 study did not meet the minimum average threshold of 5 B/T/D over the entire trapping interval. Counties and fields trapping below threshold should not be considered for rootworm control treatment on first-year corn.
(Corresponding root evaluations in nearby first-year cornfields provided the same results. Economic root ratings were detected only in Walworth, Racine and Kenosha Counties.)

Conclusions and Recommendations 2003

At this time, a grower should ***only*** consider root protection in first-year corn if the field is located in the extreme southeastern counties of Racine, Kenosha or Walworth and/or the

trapping threshold for WCR (5 B/T/D) is met or exceeded in soybean for that particular field the previous year.

It is also important to note that current research does ***not*** support late-season spraying of soybeans to control WCR beetles in an attempt to prevent egg laying (Steffey and Gray, 1999). A single spray will not cover the wide window of time that applications are not economically feasible.

If treatment is determined to be necessary, there are several options including rootworm insecticidal seed treatments, Bt rootworm hybrids or soil insecticides applied at planting. Expanded rotation is also a control option.

References Cited

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