MONITORING THE VARIANT WESTERN CORN ROOTWORM IN WISCONSIN[1/]

Southeast Wisconsin Variant Western Corn Rootworm Trapping Network

The 'eastern variant' of the western corn rootworm (WCR), *Diabrotica virgifera virgifera*, has developed a behavioral adaptation to the corn-soybean rotation in some parts of the Midwest. The variant western corn rootworm (VWCR), first documented in east central Illinois, then in Michigan, Indiana and Ohio, is known to circumvent the corn-soybean crop rotation by laying eggs in soybean. Like normal corn rootworm beetle populations, the Vwcr moves readily between corn and other crops between late July and early September. Unlike normal rootworm beetles, the VWCR can lay heavy populations of eggs in soybean fields, resulting in risk of economic injury to corn planted the next year.

Reports of lodged corn that followed soybean in various parts of southeast Wisconsin have prompted concern that northern migration of the VWCR had reached the state. In 2003, *UWEX* County Agricultural Agents, Extension Specialists and corn-soybean producers from **Racine, Kenosha, Rock, Walworth, Green, Waukesha, Jefferson, Dane and Columbia counties** coalesced to form the *Southeast Wisconsin Variant Western Corn Rootworm Trapping Network*. **Dodge and Grant Counties** were added to the network in 2005. The group's primary objectives have been to determine whether and the extent to which the VWCR is active in Wisconsin and provide education to farmers and crop advisors relative to monitoring and managing this pest. See the Proceedings of the 2005 Wisconsin Fertilizer, Aglime and Pest Management Conference for a complete project description and 2003 and 2004 results.

Published IPM research recommends a trap-based scouting protocol for VWCR in soybean to estimate egg-laying activity and provide information to guide treatment decisions for corn planted the next spring (O'Neal et al., 2001). The UW Extension Network follows the soybean scouting protocol developed by the University of Illinois using 12 Pherocon AM yellow sticky traps evenly spaced throughout the soybean field to be rotated to corn (Cook et al., 2005). Trapping begins the last week of July and continues for 4 weeks. Each week, total WCR beetle counts are recorded from each trap and traps are replaced. At the end of the sampling period, the average number of adults caught/trap/day is calculated. An average of 5 beetles/trap/day (B/T/D) over the August sampling period has been documented to result in economic root injury for corn planted in the field the next season. Visually, regular WCR and VWCR adults look the same. Currently, there are no genetic screening methods available to distinguish between the two strains. Trap-based scouting and use of the IPM threshold for adult beetles in soybean is the most reliable method available to determine treatment needs for first-year corn.

In 2005, the Network monitored 71 soybean fields in southern Wisconsin to notify farmers of changes in the distribution of VWCR in Wisconsin (Figure 1). Of these, 13 exceeded the economic threshold of 5 B/T/D. As in 2003 and 2004, these **higher levels of VWCR activity were restricted to Kenosha, Racine, Walworth and Rock counties, with one exception–in Dodge County**. One of the five fields trapped in Dodge County also exceeded the threshold and two of the five were just under the threshold. This indicates a northward movement in Wisconsin of the VWCR from the far southeastern counties into Dodge County. While none of the ten fields trapped in Jefferson County (next county south of Dodge) exceeded the threshold, two of the ten approached it.

[1/] Funding provided by the Wisconsin Soybean Marketing Board; see list of Network participants at the end of this paper.

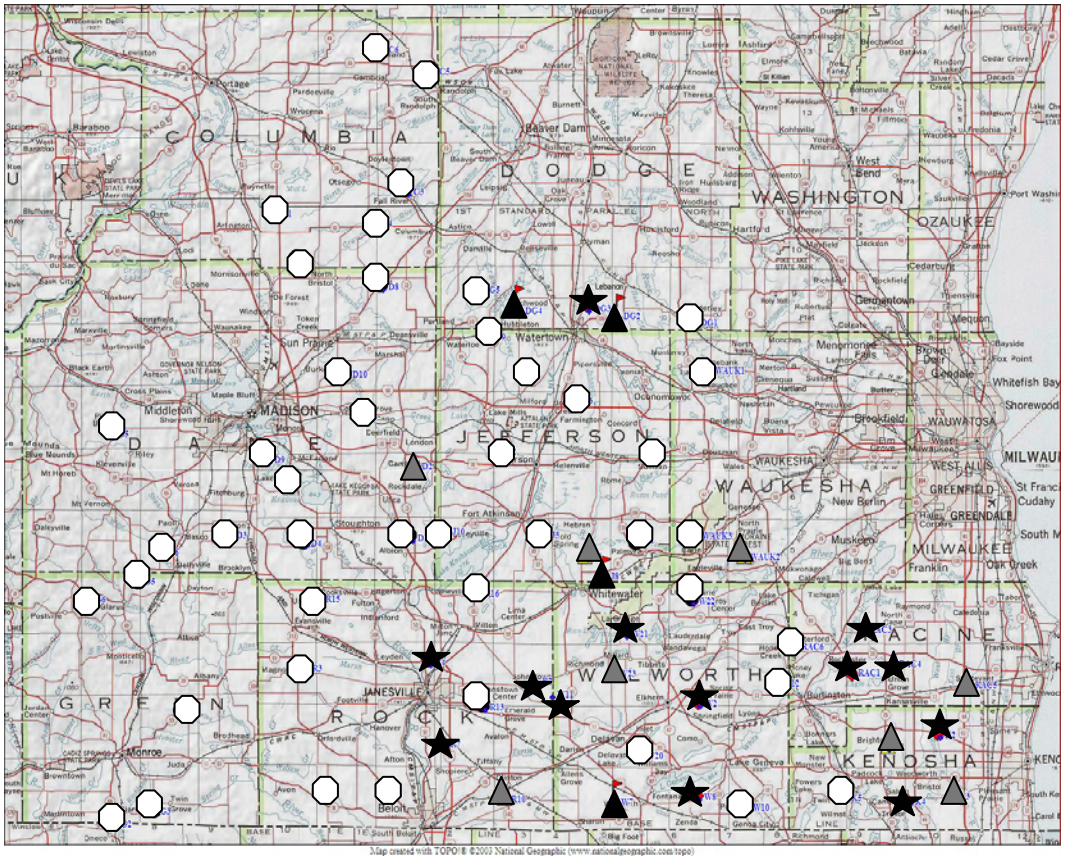

Figure 1. Western corn rootworm beetle abundance in 69 soybean fields trapped for 4 to 5 weeks during August-September 2005 in Southeastern Wisconsin. Open white circles well below threshold (0.00 to 2.99 B/T/D); Grey triangles below threshold (3.00 to 3.99 B/T/D); Black triangles near threshold (4.00-4.99 B/T/D; Black stars above threshold (5.00 B/T/D and greater). [2/]

Data from this project show the need for producers of corn and soybean in these affected counties (Kenosha, Racine, Walworth, Rock, and Dodge) to be aware that corn planted after soybean is now at an increased risk for economic damage from VWCR feeding. The degree of risk for an individual field, however, is difficult to determine due to the variation with which thresholds are exceeded. For example, in the affected counties in 2005, 22 of the 35 fields trapped were below the economic threshold. Trapping soybean fields for WCR activity is currently the most reliable way for assessing the risk to a following corn crop and can be used as part of an IPM-based approach to determine the need for a corn rootworm insecticide or Bt rootworm corn hybrid at planting. As of now, farmers outside the affected counties appear to face low risk for economic damage from VWCR in corn following soybean.

Whether farmers will choose to trap or automatically use an insecticide treatment will depend on the costs and returns of each approach. Preliminary economic analyses favor trapping, but additional evaluation is needed, which is one of the next steps for this project. Other next-steps include evaluation of lower intensity trapping/monitoring methods and monitoring adult VWCR activity in additional crop rotations.

[2/] In addition to the 69 soybean fields monitored in 10 contiguous counties (Fig. 1), 2 fields were monitored in Grant Co.. Both Grant Co. fields trapped well below threshold at 0.24 and 0.56 B/T/D, respectively.

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