

RESISTANCE TO BT CORN BY WESTERN CORN ROOTWORM IN THE U.S. CORN BELT

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Abstract:

Transgenic Bt corn hybrids that produce insecticidal proteins from the bacterium *Bacillus thuringiensis* Berliner have become the standard insect management tactic across the U.S. Corn Belt. Widespread planting of Bt corn places intense selection pressure on target insects to develop resistance, and evolution of resistance threatens to erode benefits associated with Bt corn, such as reduced reliance on conventional insecticides. Recognizing the threat of resistance, the U.S. Environmental Protection Agency requires seed companies to include an insect resistance management (IRM) plan when registering a Bt trait. The goal of IRM plans is to delay Bt resistance in populations of target insects. One element of IRM is the presence of a non-Bt refuge to maintain Bt-susceptible individuals within a population, and growers are required to implement IRM on-farm by planting a refuge. Field-evolved resistance has not been detected for the European corn borer, *Ostrinia nubilalis* (Hubner), even though this species has been exposed to Bt proteins common in U.S. corn hybrids since 1996. The IRM situation is unfolding differently for Bt corn targeting the western corn rootworm, *Diabrotica virgifera virgifera* LeConte. In this article, we examine the scientific evidence for *D. v. virgifera* resistance to Bt rootworm traits and the cropping system practices that have contributed to the first reports of field-evolved resistance to a Bt toxin by *D. v. virgifera*. We explain why this issue has developed, and emphasize the necessity of an integrated pest management approach to address the issue.

The full article text is available Open Access at the Entomological Society of America's Journal of Integrated Pest Management:

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Reference:

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