

WEEDY TRANSGENIC VOLUNTEER CORN IN CORN AND THE EFFECT ON CORN ROOT DAMAGE BY WESTERN CORN ROOTWORM. Paul T. Marquardt*, Christian H. Krupke, and William G. Johnson, Research Associate, Department of Botany and Plant Pathology, Assistant Professor, Department of Entomology, Professor, Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 47907.

Volunteer corn expressing herbicide-resistance is a problematic weed in continuous corn production. This issue is partially due to the increasing prevalence of stacking both herbicide and insect-resistant (mainly Bt) traits into the same genetically-modified plant. The increase is attributed to the 2003 introduction and adoption of corn expressing Bt traits targeting the western corn rootworm (WCR), the most damaging insect in corn production. Previous research indicates that the Bt concentration in volunteer corn may be less than the Bt concentration of adjacent hybrid corn. Thus, volunteer corn expressing Bt may increase Bt selection pressure on WCR populations and the likelihood of root damage to adjacent hybrid plants. Our objectives were to quantify the concentration of Bt expressed in volunteer corn root tissue and to determine the effect of volunteer corn on adjacent hybrid corn root damage. We sampled volunteer corn root tissue from corn and soybean fields and measured the Bt concentration using quantitative ELISA. Roots of Bt positive and negative volunteer corn and the corresponding hybrid corn within 0.5 m of the volunteer corn were sampled and rated for damage. Volunteer corn expresses twice the concentration of Bt in corn than in soybean. Also, volunteer corn expressing Bt does not impact the amount of damage sustained by hybrid corn plants less than 0.5 m from volunteer plants (positive or negative for Bt). In-field factors such as soil nutrient levels (nitrogen, sulfur, etc) may ultimately affect the expression of Bt in volunteer corn plants. Due to the higher nitrogen levels in corn fields, volunteer corn in corn may not affect the efficacy of adjacent hybrid Bt corn on WCR.