COMPETITION OF TRANSGENIC VOLUNTEER CORN WITH SOYBEAN AND THE IMPLICATIONS FOR WEED AND INSECT RESISTANCE MANAGEMENT. 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, 47907.

Glyphosate-resistant volunteer corn is a problematic weed in corn/soybean rotational systems. This issue is partially due to the increasing prevalence of stacking both glyphosate and insect-resistant (mainly Bt) traits into the same genetically-modified plant. Volunteer corn expressing Bt traits, which target the western corn rootworm (WCR), may potentially increase the Bt selection pressure on WCR populations. Volunteer corn can also compete with soybean, lowering yields. The objectives of this study were to determine how WCR emergence is affected by different densities of volunteer corn and to quantify the impact of volunteer corn on soybean growth and yield. Volunteer corn seed was hand-planted at densities ranging from 0.5 to 16 plants/m^2 within soybean plots. Densities were established at soybean planting and two weeks after planting to account for early and late emerging corn. WCR emergence was assessed using field emergence traps placed over individual corn plants in the 0.5 and 16 plants/m^2 plots. Data collected included the adult emergence of WCR, corn leaf area, dry weight (corn and soybean), and soybean yield. Twice as many adult WCR emerged from a single volunteer corn plant in 16 plants/m^2 plots compared to 0.5 plants/m^2 plots. Soybean yield reductions were 1516 kg/ha in the early planted 16 plants/m^2 plots. Yield reductions in 2008 and 2009 occurred when 2 and 4 plants/m^2, respectively, emerged at the same time as soybean. No soybean yield loss occurred when volunteer corn emerged after soybean. Our results show that controlling volunteer corn will not only prevent soybean yield loss, but it may decrease Bt selection pressure on WCR populations.

2009 North Central Weed Science Society Proceedings 64:77.