RESISTANCE MANAGEMENT OF THE WESTERN CORN ROOTWORM (*DIABROTICA VIRGIFERA VIRGIFERA*): BEHAVIOR, SURVIVAL AND THE POTENTIAL FOR CROSS RESISTANCE ON BT CORN IN THE FIELD, GREENHOUSE AND LABORATORY

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ABSTRACT

Western corn rootworm (WCR), *Diabrotica virgifera virgifera,* larval movement between Bt and isoline plants can be detrimental to resistance management for high dose Bt products because the insect larvae will potentially be exposed to sublethal amounts of the Bt however, the effect of this movement on low to moderate dose products is unknown. All current rootworm products are low dose. We found that movement between isoline and SmartStax® hybrid plants did occur in seed blend scenarios in our field study. The majority of plant damage to the SmartStax plants occurred when the larvae moved from surrounding infested isoline plants moved late in their development, therefore resistance will likely not develop in these larvae. In a similar experiment, movement also occurred between Agrisure® Duracade™ and isoline plants in seed blend scenarios, however the damage was low for all treatments. With isoline plants being mixed with Bt plants in seed blend fields, host recognition behavior of the western corn rootworm of the Bt and isoline plants is also important to understand. There were no differences between the host recognition behavior of the rootworm larvae after exposure to mCry3A, Cry3Bb1, and Cry34/35Ab1 corn hybrids, therefore all hybrids were perceived as hosts by WCR larvae. With all the hybrids on the currently registered being pyramided by different companies to control rootworms, the potential for cross resistance between these hybrids was evaluated. Based on the data from laboratory and greenhouse assays, the potential for cross resistance between mCry3A and Cry3Bb1 might be likely, but not between these hybrids and Cry34/35Ab1.