

Public Abstract

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Title: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

Pest movement between transgenic Bt and non-Bt plants can speed the development of resistance to high-dose Bt products because larger larvae are more tolerant to toxins. The effect of this movement on low to moderate-dose products is unknown. All current transgenic products targeting *Diabrotica virgifera virgifera* LeConte, the western corn rootworm (WCR) are low dose. We documented significant larval movement between Bt and non-Bt plants for two types of hybrid corn, each with two different transgenes targeting WCR, but it is not clear that this movement is causing selection for resistance. Laboratory-selected resistance to all single transgenic traits targeting WCR has been developed and field resistance has developed to at least one Bt protein targeting WCR. The potential for cross resistance between products was evaluated using resistant and susceptible field populations. Based on the data from laboratory and greenhouse assays, the potential for cross resistance between mCry3A and Cry3Bb1 is possible, but was not present between these proteins and Cry34/35Ab1. Host recognition behavior of WCR had previously been suggested to differ on artificial diets with and without Bt proteins. However, there were no differences between the host recognition behavior of WCR larvae after exposure to mCry3A, Cry3Bb1, Cry34/35Ab1, or their corresponding non-Bt corn hybrids, suggesting all hybrids were perceived as hosts by WCR larvae. Overall, information gathered in these studies provides important behavioral information on WCR that will aid in making decisions involving Bt corn hybrids.