IMPACT OF ALTERNATE HOST PHENOLOGY AND ALTERNATE HOST-TRANSGENIC CORN INTERACTIONS ON THE WESTERN CORN ROOTWORM (COLEOPTERA: CHRYsomelidae).

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ABSTRACT

With the increasing adoption of transgenic maize with resistance to rootworms, combined with glyphosate tolerance, as a control tactic for western corn rootworm, Diabrotica virgifera virgifera LeConte, an understanding of the effect of alternate host plants on rootworm population dynamics is critical to the formulation of effective IRM programs. Three studies were conducted to evaluate the effects of alternate host plant phenology on the survivorship, growth, development, and host-searching behavior of larvae, as well as the effect of initial feeding of larvae on an alternate host followed by movement to rootworm-resistant transgenic corn on beetle emergence and reproductive fitness of emerged female beetles. Initial feeding on alternate hosts followed by movement to Bt maize increased beetle emergence from Bt maize, fecundity of those that survived, and the number of viable eggs produced. In greenhouse trials, western corn rootworm larvae had significantly greater survival on younger grassy weeds (4 to 6 weeks old) versus older grassy weeds. In behavioral tests, western corn rootworm larvae recognized younger roots (4 week old) as hosts but did not recognize older roots (7 or 10 week old) as hosts. Phenological changes in grassy weeds could encourage movement of larvae from weeds to transgenic maize.

Key Words: Corn rootworm, Diabrotica, alternate host, phenology, search-behavior