

Green and Growing

Written by D. Bruce Bosley, CSU Extension Agent/Cropping Systems

Colorado State Extension Agents are collaborating with corn breeders to evaluate corn fields for western corn rootworm damage this summer.

Extension agents Ron Meyer, Wilma Trujillo, Alan Helm and Bruce Bosley will be working on a Monsanto Company project along with their agronomists. This team's study will focus on fields planted with corn that includes enhanced genetics for controlling corn rootworm feeding.

Over the past few years, eastern Colorado farmers and field scouts had noted an increased survival of western corn rootworm in Bt corn fields. The rootworm survival in Bt corn fields was most evident in 2011.

Last year, many fields had severe lodging and significant losses of corn roots and harvest yields where rootworms survived this genetically enhanced trait. At this time the rootworm survival has only been found where just one rootworm Bt trait is in the corn plant genetics. This problem hasn't occurred in corn fields where two rootworm Bt genes have been included in the genetics of the seed.

The enhanced genetics of corn in the study has toxins from one or two specific Bt genes. Bt is shorthand for common soil inhabiting bacteria called *Baccillus thuringiensis*. Bt also refers to insecticide products made from these bacteria.

The insecticide product from this strain of Bt only affects the corn rootworm and some other beetle species. Bt from this strain is not harmful to any other insects, wildlife, livestock or humans that feed on this corn or its byproducts.

Rootworm control in continuous corn prior to Bt corn seed had been accomplished through seed treatments and soil applications of insecticides. In fact, prior to the advent of Bt corn, rootworm pesticide applications accounted for most of the insecticide uses in corn fields. Insecticide failures were fairly common.

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Perhaps more importantly, farmers applying pesticides for corn rootworm risked dangerous exposure to these pesticides both for themselves and indirectly to their families.

University studies have shown corn rootworm control with Bt events to be superior to soil insecticides and seed treatments except under very high corn rootworm pressure. Under such conditions, performance is more similar to that of soil-applied insecticides, while remaining superior to seed treatments.

Finally, corn rootworm problems in the western High Plains region are prevented by growing corn following other crops in a rotation. Western corn rootworm will only feed on corn roots and other corn tissues. They will not feed or survive on any other crop.

Because female rootworm beetles lay their eggs in the soil of corn fields and not in other crops, rotating corn with wheat, beans, sugar beets, alfalfa and other non-corn crops will break this pest's life cycle. Use of rotations with other crops is currently the best method of avoiding this insect problem.

The CSU Extension agents along with their industry partners plan to better understand why failures occur with Bt corn genetics through this study. They also hope to discover ways of keeping this important rootworm control tool effective for corn growers.

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