

Resistance to management tactics by pests is a growing issue worldwide. Over 540 species of insects and mites have developed resistance to pesticides and plant incorporated protectants. In the United States alone, an estimated \$1.4 billion is lost each year due to increased control costs and lost yield. One such pest is the western corn rootworm (WCR). This pest has earned the nickname “billion-dollar bug” from its impact on corn production worldwide. Resistance in field populations of WCR to the plant incorporated protectant *Bacillus thuringiensis* (*Bt*) protein *Cry3Bb1* was first documented in Iowa in the 2011 growing season. During the 2012 and 2013 growing seasons, resistance was documented in Nebraska. In response to these growing concerns about WCR resistance to *Bt*, Western Corn Rootworm Resistance Update (WCRRU) program was delivered as an add-on to the private pesticide certification training in Northeast Nebraska during 2015, 2016, and 2017.

The goal of WCRRU was to deliver information on the biology and management of WCR and its resistance to *Bt* and insecticides. Information in the program was assembled by Lance Meinke, Julie Peterson, and myself. All programs were delivered by myself.

In order to accomplish this goal, WCRRU was designed as a 45-minute component of the Private Pesticide Applicator Training. It also served as a way to cover the Integrated Pest Management section requirements of the Nebraska Department of Agriculture with timely information on WCR. Delivery method for the program was an interactive PowerPoint using TurningPoint clickers to allow anonymous participation of producers. Pest management decisions for WCR by the producers were polled, and the results displayed immediately for peer comparisons.

Through the life of the WCRRU, it was delivered at 29 trainings with 928 attendees representing an estimated >1 million acres (n=847). While no additional revenue was generated, an existing program, private pesticide applicator training, was leveraged for delivery. As result, a large portion of the producers in the region participated. They valued the information received at \$6.48/A for a total clientele value of \$6.8 million.

End-of-meeting and three year follow up surveys were used to evaluate WCRRU. Cumulative results from the end of meeting surveys indicated significant improvements in knowledge. This was illustrated by 92.9% of participants increasing their knowledge of WCR management practices (n=806). In addition, 77.6% of participants planned to adopt or change management practices within their operations to combat resistance development in WCR (n=687).

The three-year follow up surveys were conducted when producers needed to recertify their private pesticide applicator license. Surveys showed that 67% of respondents (n=321) reported changing production practices to reduce WCR resistance development by rotating *Bt* proteins, implementing a new crop rotation, and/or rotating insecticide mode of action for adult or larval control.

Following one of the programs, one producer stated, “I didn’t realize I wasn’t rotating my *Bt* protein selections until tonight. I thought I was by changing my hybrid number, but never considered the trait package.”