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FIELD CORN: *Zea mays* L., '(DKC51-19RIB)'**Evaluation of Foliar Insecticides for the Control of Western Bean Cutworm in Field Corn, 2015*****Débora G. Montezano,¹ Kayla A. Mollet,¹ Grace E. Hirzel,² and Julie A. Peterson^{2,3}**

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Western Bean Cutworm (WBC): *Striacosta albicosta* (Smith)

Corn (hybrid, maize, sweet) | *Zea mays*

The western bean cutworm (WBC) is an important pest of corn and dry beans. This study was conducted within the historic range of WBC in western Nebraska; however, it has undergone a rapid range expansion into the eastern Corn Belt within the last 16 years. This field trial was established to evaluate the efficacy of a single application of foliar insecticides against this pest to prevent feeding damage to non-Bt corn ears. The trial was located at the University of Nebraska-Lincoln's West Central Water Resources Field Laboratory in Keith County, Nebraska, USA (41.160246° N, -102.035695° W). A RCB design with four treatments (including an untreated check) and four replications was used. Each plot was eight rows by 30 ft. The trial was planted on 8 Jun using a small plot research planter at 32,000 seeds/acre at an approximate depth of 1.4–1.75 inch in 30 inch rows. The hybrid planted was DKC51-19RIB (Monsanto Company, St. Louis, MO) expressing Cry1A.105, Cry2Ab2, and Cry3Bb1 Bt proteins, which do not affect WBC. The plots received irrigation, fertilization, and weed management inputs following standard agronomic practices for the region, with no insecticide applications other than the experimental treatments.

The plots were scouted weekly for the presence of WBC eggs and larvae following the onset of moth flight on 26 Jun. The economic threshold was reached on 21 Jul with >7% of plants being infested by egg masses or early instar larvae. Foliar insecticide treatments were applied 31 Jul using a backpack sprayer with an 8.3 ft handheld boom. Insecticides were delivered at 15 gpa carrier volume through six TeeJet AIXR 11002 Yellow nozzles 20 inches apart with 30 psi pressure maintained with a CO₂ propellant. Applications were made to the middle four rows of each plot with a single pass.

On 27 Aug, 10 ears from the central two rows and interior 22 ft of each plot were randomly chosen and removed along with the husks. The ears were husked and examined in the laboratory to determine feeding damage to aborted kernels at the ear tip and harvestable kernels. The presence of WBC larvae in the ears was also recorded. The data was analyzed using PROC MIXED with mean separation by least square means ($P=0.05$) in SAS version 9.4.

In the untreated check, 35% of corn ears were infested with WBC larvae. Mean feeding damage for the untreated check ranged from 0.0 to 4.5 cm² with a mean of 0.9 cm² for aborted ear tip kernels and 0.0–3.6 cm² with a mean of 0.6 cm² for harvestable kernels.

Table 1

Treatment/formulation (AI)	Rate (fl oz/acre)	Mean feeding damage to aborted kernels (cm ²)	Mean feeding damage to harvestable kernels (cm ²)	% of ears infested with WBC larvae
Untreated Check	–	0.9 a	0.6 a	35
Asana XL EC (Esfenvalerate)	5.8	0.0 b	0.0 b	0
Prevathon SC (Chlorantraniliprole)	20	0.0 b	0.0 b	0
Steward EC (Indoxacarb)	10	0.0 b	0.0 b	0

Different lower case letters indicate statistical significance at $p=0.05$.

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Infestation of ears and feeding damage was likely reduced due to high larval mortality caused by a temporal mismatch between crop growth stage and larval development. Early instars of WBC survive best on fresh tassel tissue, which was not available during early larval development due to weather delays in planting. All foliar insecticide treatments significantly reduced ear feeding damage when compared to the untreated check (Table 1). In fact, 0% of corn ears

from all three insecticide treatments were infested with WBC larvae and no feeding damage to either aborted ear tip kernels or harvestable kernels was observed. Therefore, the combination of high larval mortality from both insecticide applications and developmental mismatch with the host plant is believed to have effectively controlled WBC in this trial.