EFFICACY OF SELECTED INSECTICIDES FOR CONTROL OF LEPIDOPTERAN PESTS IN SOYBEANS

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Abstract

Corn earworm, *Helicoverpa zea* (Boddie), (CEW) is the most economically important insect pest of soybean, *Glycine max* (Merrill), in Arkansas. Feeding can occur at any growth stage prior to physiological maturity on leaves, flowers, and pods. Soybean looper (SBL), *Chyrsodeixis includens* Walker, is also a major pest of soybean causing defoliation of soybean in Arkansas. Feeding from these pests can result in yield loss if not controlled with foliar insecticides. Trials were conducted in 2020 to evaluate the control of CEW and SBL with selected insecticides. Treatments included Prevathon (chlorantraniliprole), Besiege (lambda-cyhalothrin + chlorantraniliprole), Intrepid (methoxyfenozide), Intrepid Edge (methoxyfenozide + spinetoram), lambda cyhalothrin + acephate, Steward (indoxacarb), Lannate (methomyl), Denim (emamectin benzoate) and Hero (bifenthrin + zeta-cypermethrin).

Introduction

Soybean is one of the most prominent row crop commodities in Arkansas. Corn earworm (*Helicoverpa zea)* is the most economically detrimental insect pest of soybean and is also considered a major pest of cotton production. Unlike most lepidopteran pests commonly observed in row crops, corn earworm predominantly feeds on the fruiting structures of these plants inflicting direct yield loss. Corn earworm has multiple generations per year, and their wide host range allows it to have readily available food sources and oviposition sites throughout the growing season. Earlier generations exposed to Bt toxins as well as synthetic chemicals allows offspring to acquire resistance, potentially making control more difficult in later flowering crops such as cotton and soybean. Another major insect pest of soybean is the soybean looper (*Chrysodexius* includens). Loopers migrate into Arkansas in late July and early August and have up to four generations a year when climate and food resources are optimal. Loopers are foliage feeders and can average a 9.3% loss in grain yield. Studies have shown some looper populations are resistant to pyrethroids, raising the cost of control. Producers are currently seeking chemical options that provide high efficacy and residual longevity. The objective of these studies was to determine the efficacy of selected insecticides for control of corn earworm and soybean looper.

Methods

Two experiments were conducted during the 2020 growing season at two soybean locations in Tillar, AR and Lexa, AR. Each plot was four 38” rows and plots measured 50ft in length. Insect populations were determined by sweep net sampling. A total of 25 sweeps were taken per 50 ft plot. Applications were made using a Bowman Mudmaster at 10 gpa using a Cone-jet nozzle. Each of the tests have 5 treatments, Prevathon (chloantraniliprole) at 14 oz/A, Besiege (chloantraniliprole+ lambda-cyhalothrin) at 8 oz/a, Intrepid Edge (methoxyfenozide+ spinetoram) at 4 oz/a, a confidential treatment, and an untreated check. After application tests were sampled 3,7, and 15 days after application (DAA) in the Lexa location and 4,11,17,24 DAA in Tillar.

Results

Corn Earworm Efficacy Trial

At the Tillar location, 4, 11, and 17 DAA all products provided control of corn earworm compared to the untreated check. At 24 days after application, Prevathon and Besiege were the only products still providing residual control of corn earworm (Figure 1). At the Lexa location, Prevathon, Besiege and Intrepid Edge all provided control at 3 and 7 DAA. The confidential chemical did not provide control at 3 DAA but reduced corn earworm numbers 7 DAA when compared to the untreated check (Figure 2).

Soybean Looper Efficacy Trial

All products provided control of soybean looper at the Tillar location up to 17 DAA. At 24 DAA Intrepid Edge lost residual control with no difference between it and the UTC (Figure 3). Prevathon, Besiege, and Intrepid Edge provided significant control of soybean looper at the Lexa location. for up to 15 DAA. The confidential chemical provided control until 7 DAA but lost control at 15 DAA (Figure 4).

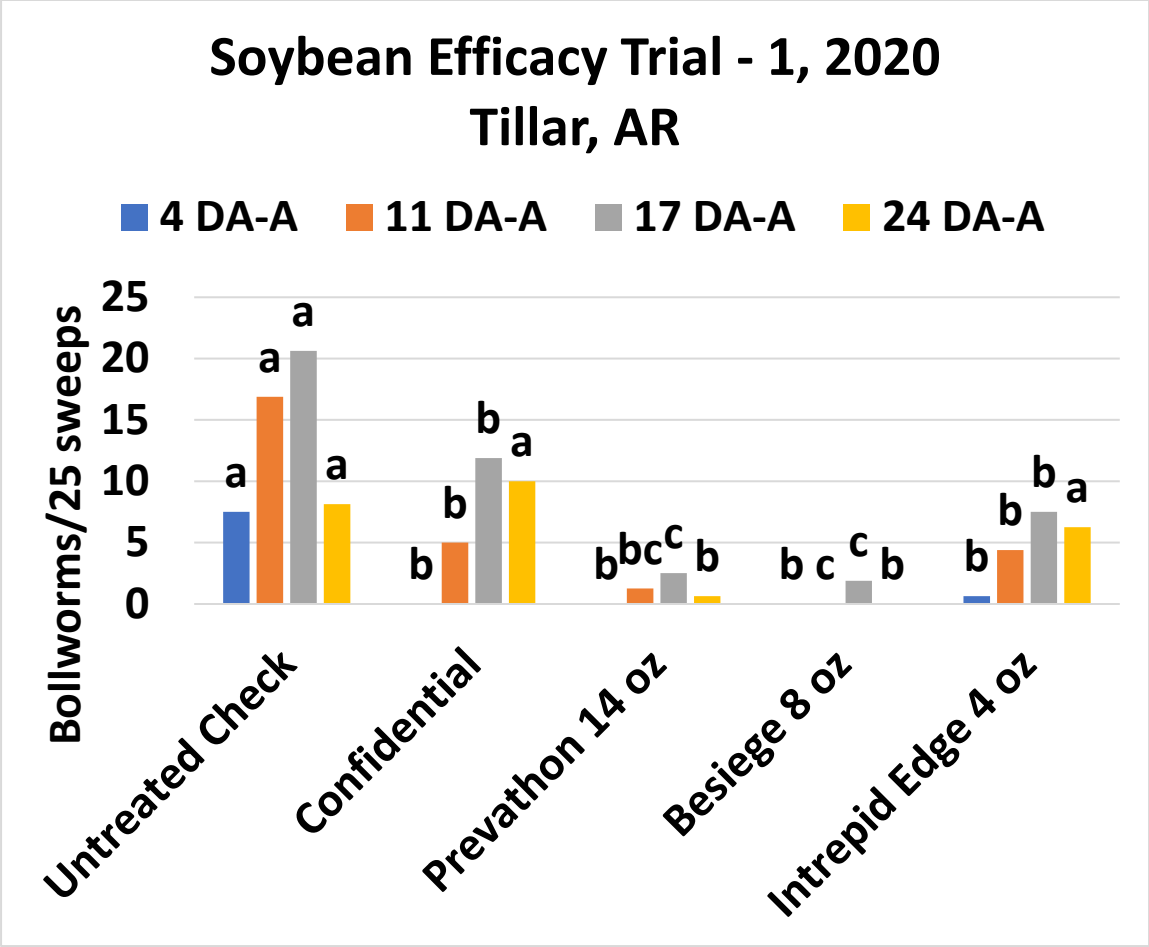

Figure 1. 2020 Bollworm efficacy trial in Tillar, AR.

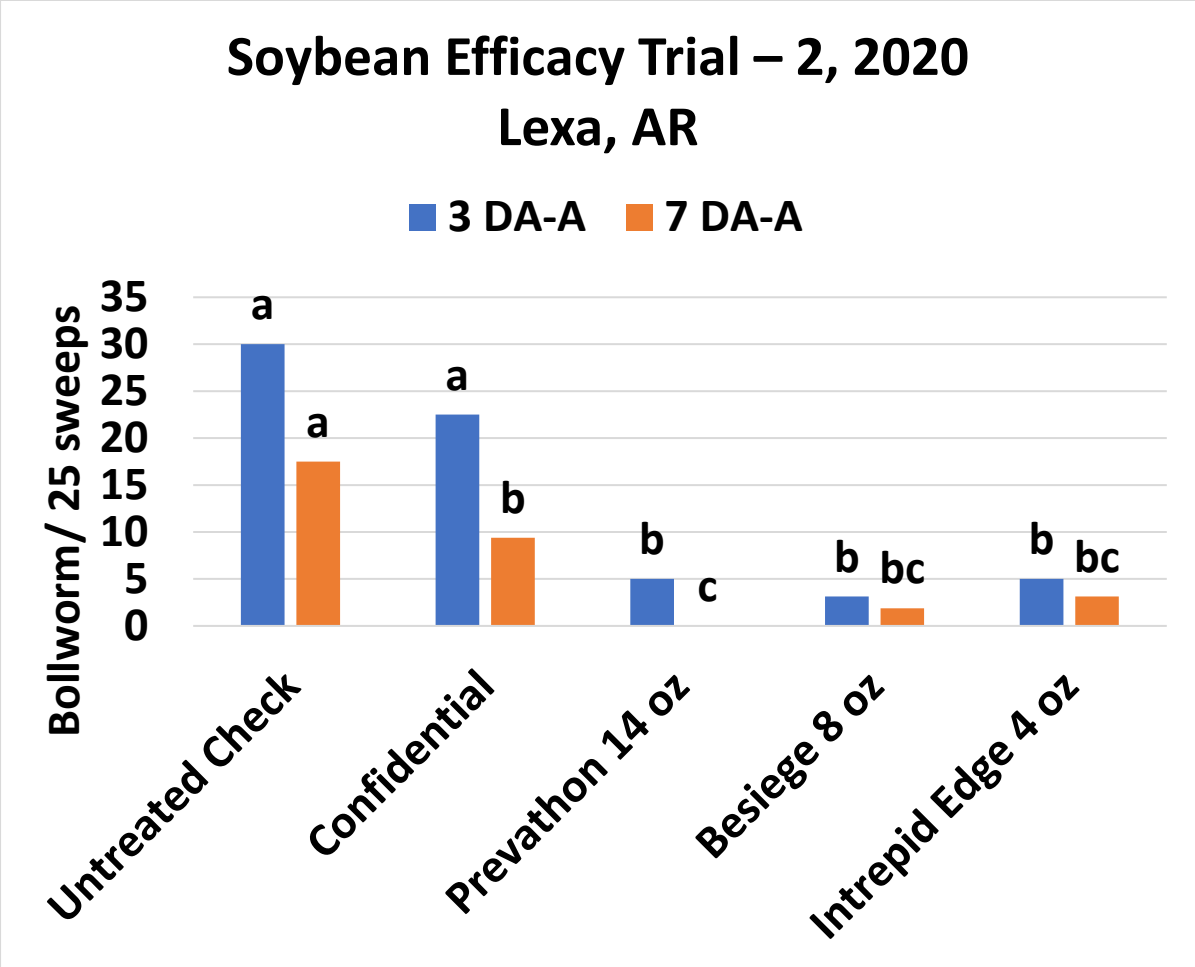

Figure 2. 2020 Bollworm efficacy trial in Lexa, AR.

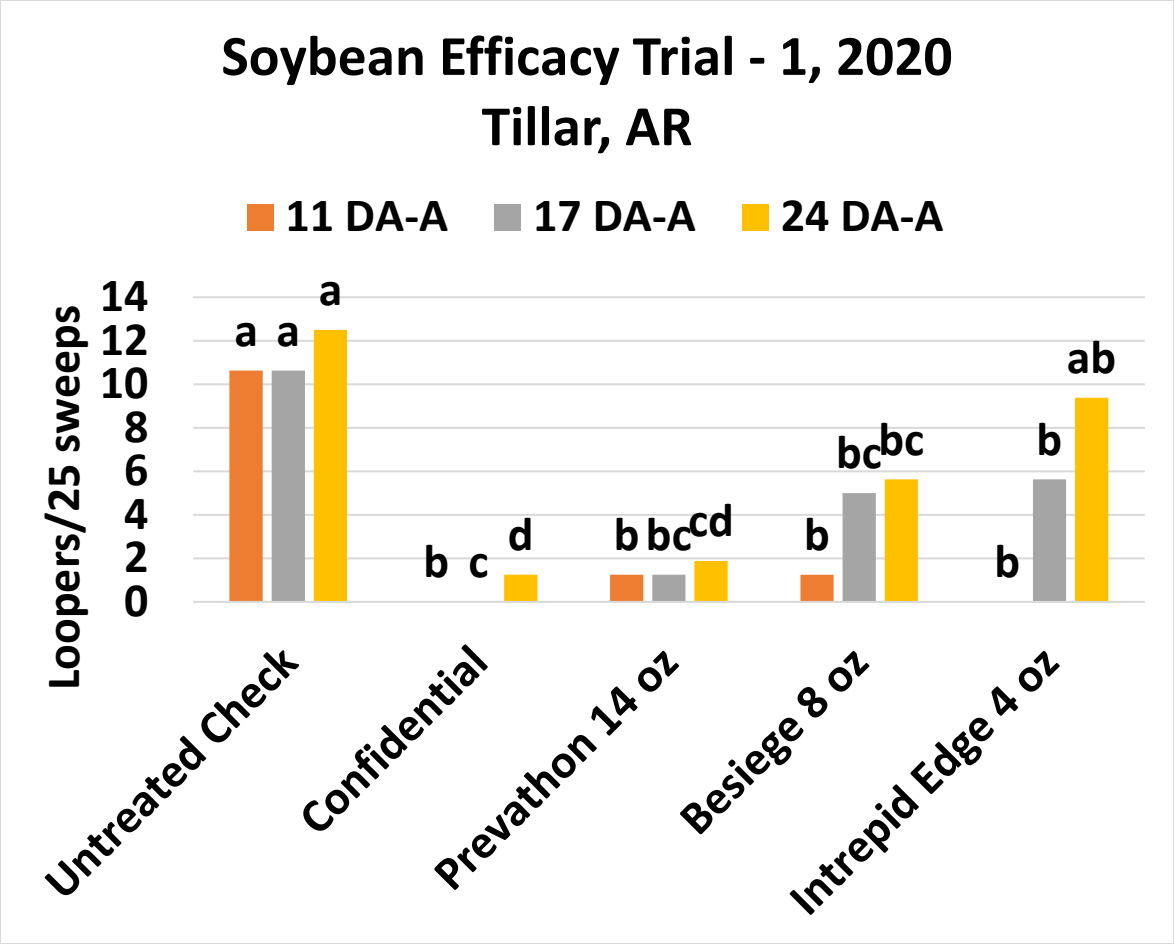

Figure 3. 2020 Soybean looper efficacy trial in Tillar, AR.

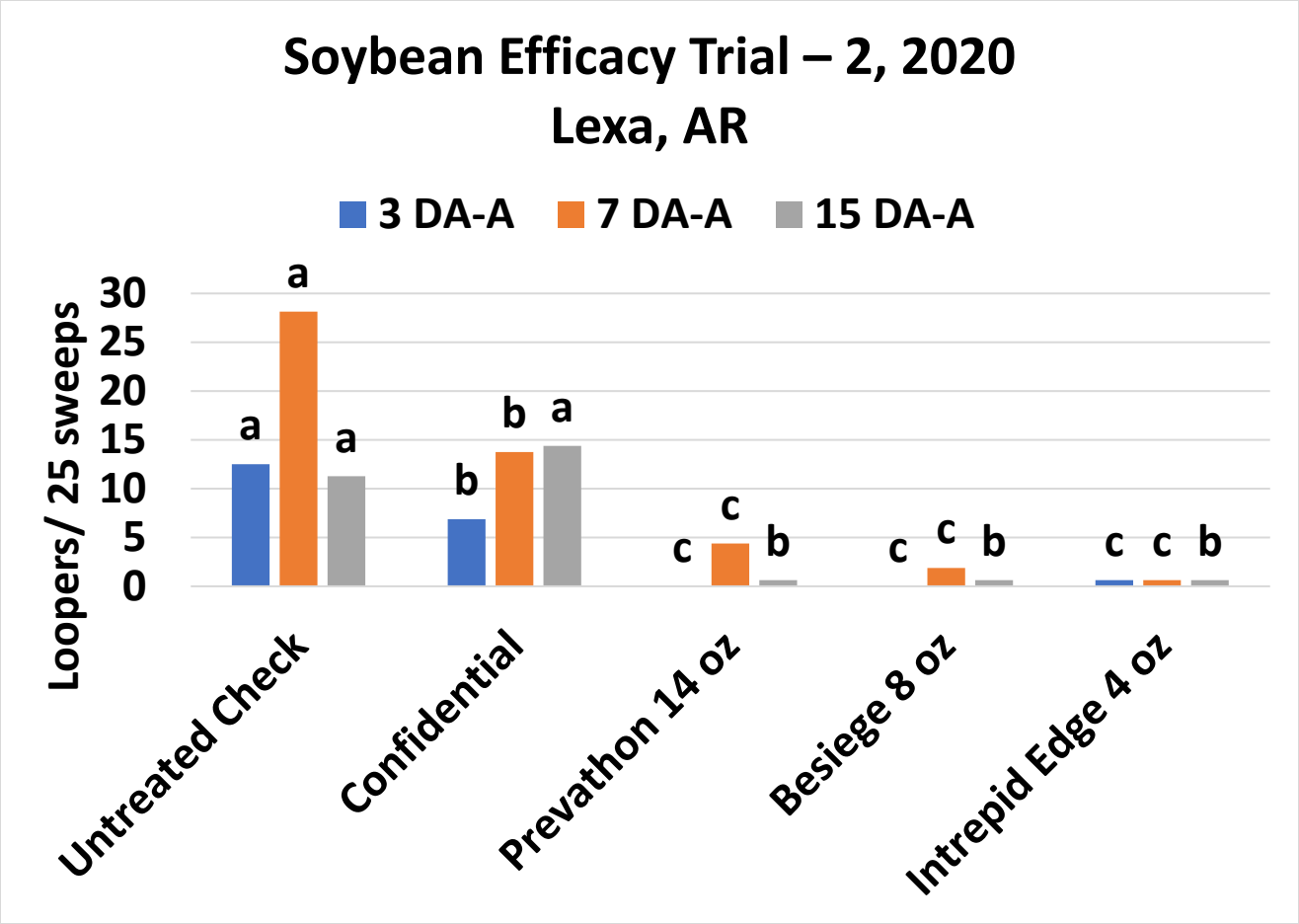

Figure 4. 2020 Soybean looper efficacy trial in Lexa, AR.

Summary

This data suggests that Besiege, Prevathon, and Intrepid Edge all provide good initial control of corn earworm. Besiege, Prevathon, and Intrepid Edge all provide good initial control of soybean loopers. Besiege and Prevathon provided longer residual control of corn earworm and soybean looper than other insecticides.

Acknowledgments

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