EFFICACY OF SELECT INSECTICIDES FOR CONTROL OF COTTON BOLLWORM, HELICOVERPA ZEA, IN CONVENTIONAL COTTON

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Abstract

A test was conducted on a grower field in Jefferson County, Arkansas to evaluate the efficacy and residual control of selected foliar insecticides and rates on bollworm in conventional cotton. Selected insecticides included bifenthrin, Prevathon, Besiege, and Intrepid Edge. At 9 days after application (DAA) all treatments except bifenthrin maintained fruit damage levels below the 6% damage threshold. At 17 DAA, bifenthrin and Intrepid Edge (6 oz/a) were the only treatments that did not maintain fruit damage levels below threshold. At 23 DAA, Prevathon (20 oz/a) was the only treatment that maintained fruit damage levels below threshold. Results indicate that higher labeled rates of Prevathon provide an increase in residual control when compared to the lower labeled rate (14 oz/ A).

Introduction

Historically, bollworm, *Helicoverpa zea* (Boddie), has been the most damaging insect pest of cotton in Arkansas and has only recently been surpassed by the tarnished plant bug, *Lygus lineolaris* (Palisot de Beauvois). In 2016, 100% of Arkansas cotton acres were infested with bollworm, *Helicoverpa zea* (Boddie), and 81% of these acres required supplemental insecticide treatments (Williams, et. al., 2016). Although *Bt* cotton is still very effective for control of tobacco budworm, *Heliothis virescens* (F.), the amount of *Bt* cotton acreage requiring treatment for bollworms has been increasing in recent years. This has led to development of a new treatment threshold for the Mid-South of 6% damaged fruit, with bollworms present. High costs associated with technology fees for bollworm control has encouraged growers and consultants to look for ways to reduce costs. Planting conventional cotton and using foliar insecticides for bollworm control may be a more cost effective way to grow cotton in the Mid-South.

Methods

This test was conducted on a grower field in Jefferson County, Arkansas in 2017. Plot size was 12.5 ft (4 rows) by 40 ft, with a 2 row buffer between plots. Treatments were arranged in a randomized complete block design with 4 replications. Treatments consisted of an untreated control (UTC), bifenthrin 5.12 oz/a, Prevathon (chlorantraniliprole) 14 and 20 oz/a, Besiege (chlorantraniliprole + lambda-cyhalothrin) 7 and 10 oz/a, Intrepid Edge (methoxyfenozide + spinetoram) 6 and 8 oz/a. Insecticides were applied with a Mud Master fitted with 80-02 dual flat fan nozzles with 19.5 inch spacing. Spray volume was 10 gal/a, at 40 psi. Damage ratings were taken 2, 9, 17 and 23 days after application by sampling 25 squares, blooms, and bolls per plot. Plots were harvested using a John Deere two row plot picker. Data was processed using Agriculture Research Manager Version 9 (Gylling Data Management, Inc., Brookings, S.D.). Analysis of variance was conducted and Duncan's New Multiple Range Test (P=0.10) to separate means.

Results

At 9 days after application (DAA), all treatments had less fruit damage than the UTC (Fig 1). Bifenthrin was the only treatment with fruit damage levels greater than threshold. Prevathon 20 oz/a had less fruit damage than bienthrin, Prevathon 14 oz/a, and Intrepid Edge 6 oz/a.

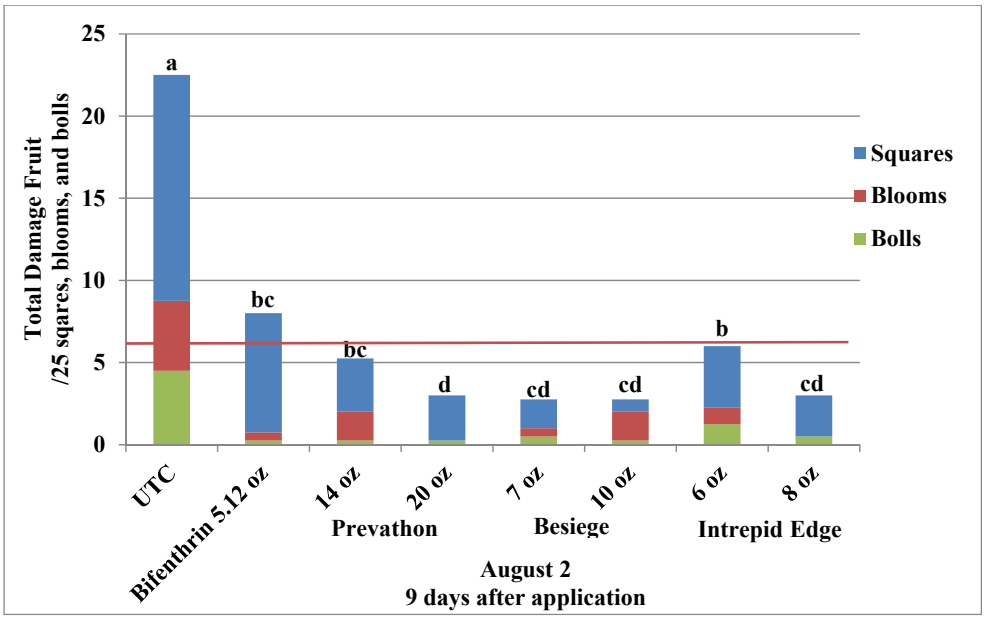

Figure 1. Assessment of damaged fruit 9 days after application of foliar insecticide.

At 17 DAA all treatments had less fruit damage than the UTC (Fig 2). All rates of Prevathon, Besiege, and Intrepid Edge had less damage than bifenthrin. Bifenthrin and Intrepid Edge 6 oz/a were the only treatments that did not maintain fruit damage levels below threshold. Besiege 10 oz/a was the only treatment with less damage than Intrepid Edge 6 oz/a.

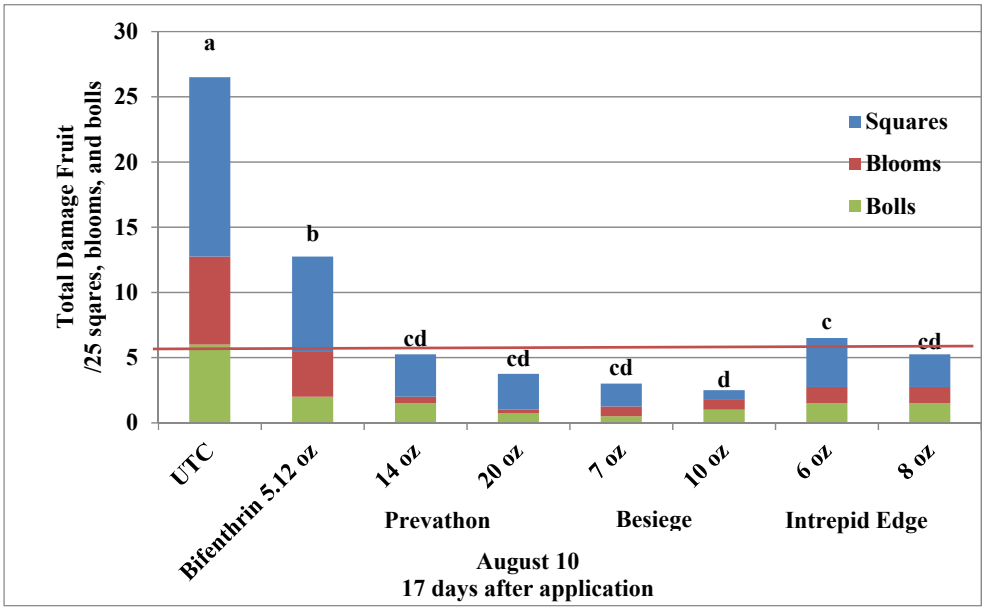

Figure 2. Assessment of damaged fruit 17 days after application of foliar insecticide.

At 23 DAA all treatments had less fruit damage than the UTC except Bifenthrin (Fig 3). Prevathon 20 oz/a had less damage than both rates of Intrepid Edge, Besiege 7 oz/a, and Prevathon 14 oz/a, and was the only treatment where damage fruit levels remained below threshold.

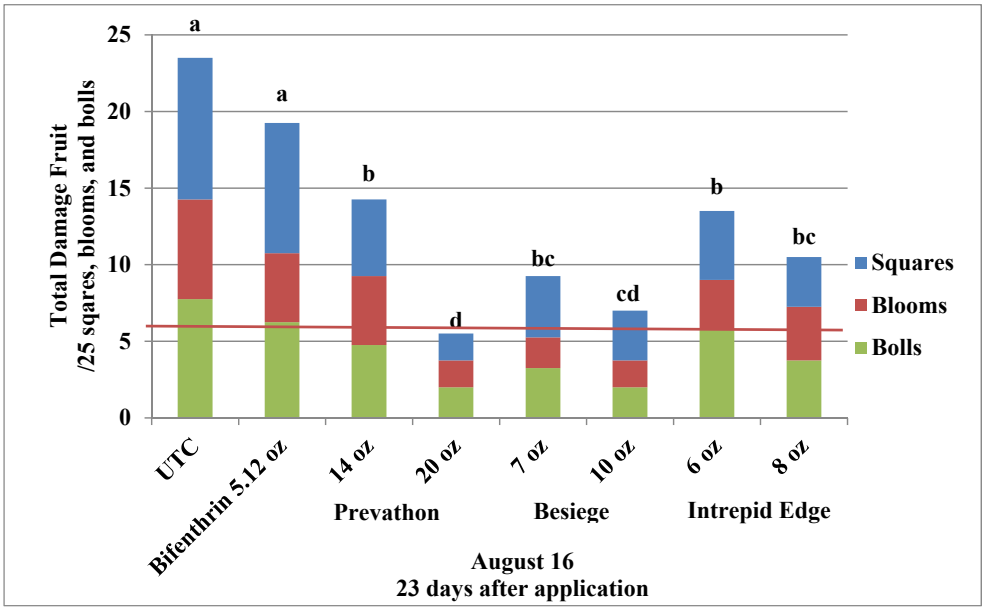

Figure 3. Assessment of damaged fruit 23 days after application of foliar insecticide.

Foliar insecticide application increased yield 100-560 lbs seed cotton/a above the UTC (Fig 4).

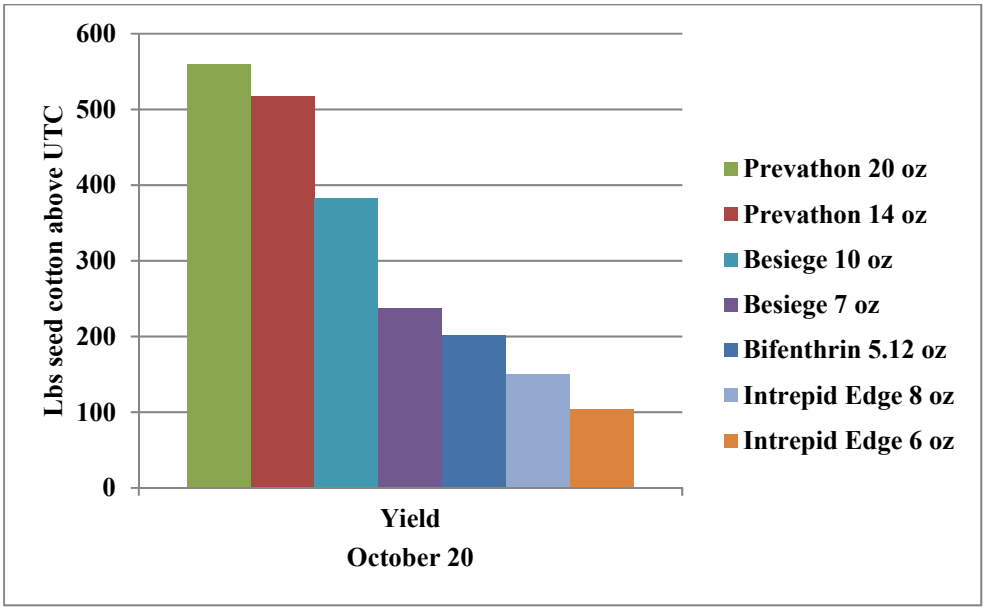

Figure 4. Pounds of seed cotton above the untreated control.

Summary

In this experiment bifenthrin 5.12 oz/a at no sample date provided adequate control of bollworms. At 23 DAA, Prevathon 20 oz/a was the only treatment still providing satisfactory level of control.

Acknowledgements

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References

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