

INFLUENCE OF BIDRIN® FOR CONTROL OF TARNISHED PLANT BUGS IN COTTON

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Abstract

The tarnished plant bug is a very significant insect pest of cotton. Evaluation of products by independent agricultural consultants in a commercial setting is a key component of developing and maintaining product expertise in the agricultural community. Regional studies consisting of side by side demonstration trials were initiated to examine the effects of Bidrin® on tarnished plant bug populations and other pests in cotton. During 2013, 49 demonstration trials were conducted by independent crop consultants located in AR, LA, MO, MS, NC, SC, TN, and TX. Numbers of surviving tarnished plant bugs, stink bugs, and cotton fleahoppers were lower with Bidrin® than comparison treatments. Results from 2013 field trials demonstrate that Bidrin® continues to be a useful tool for managing infestations of tarnished plant bugs, as well as stink bugs and cotton fleahoppers in cotton.

Introduction

As a primary pest of cotton, the tarnished plant bug (TPB), *Lygus lineolaris* (Palisot de Beauvois) consistently infests numerous cotton fields and causes economic losses. Insecticides are a key tool for reducing the impact of TPB infestations in cotton. Bidrin® contains the active ingredient dicotophos and provides excellent control against pests with piercing and sucking mouthparts, such as TPB, stink bugs, and cotton fleahoppers.

Product assessment by crop protection professionals in commercial situations is a significant component of developing new products and technologies in agriculture. In 2013, paired treatment demonstration trials were initiated across the southern US to examine the effects of Bidrin® on cotton infested with tarnished plant bugs and other pests compared to various commercial standards. In each commercial-scale test, insecticide treatments were applied with commercial equipment, and insect counts and plant damage were assessed by licensed, independent crop consultants. Findings are reported.

Materials and Methods**Design.**

Each trial was established as a large scale, paired comparison. Bidrin® alone or mixed with an insecticide was evaluated against an insecticide alone, a combination, or a premixture that is commercially registered and offered for sale. Use rates for all insecticides were within labelled use rates. Each site was planted with a locally adapted variety. A total of 49 trials were completed in AR, LA, MO, MS, NC, SC, TN, and TX. Target pests were grouped into three categories:

1. Tarnished plant bugs (TPB); located in mid-south states of AR, LA, MO, MS, and TN.
2. Cotton fleahoppers (CF); located in TX.
3. Stink bugs (SB); located primarily in southeastern states of NC and SC.

Plant growth and pest management inputs were administered according to locally accepted practices, and both plots within each trial were treated identically except for insecticide treatments as described.

Application.

Applications of Bidrin® at a rate of 3.2 to 8 fl. oz. per acre were made with commercial equipment. Treatments were applied after sampling plants and determining that insect pest densities had reached an action threshold or a point where action should be taken to minimize economic loss. Insecticide treatments were timed early season for CF, at or after first bloom for TPB, and during bloom for SB. Cooperators were advised to apply comparison treatments on the same day at commercially recommended use rates.

Field Observations.

Counts of target pests were reported as numbers per 50 sweeps, per drop cloth, or as percent infested plants, and percent reduction was calculated based on pretreatment and post-treatment counts. Consultants provided observations on other pests including aphids (# per terminal), spider mites, and bollworms if present.

Data Analysis.

Data were analyzed across locations within each year, and significant differences were determined using a paired t-test.

Results and Discussion**Key Findings:****Tarnished Plant Bugs**

- Bidrin® alone or combined with other insecticides consistently provided greater reduction in tarnished plant bugs (TPB) compared with competitive treatments (Figure 1). In three of four groupings, the differences were statistically significant.
- Likewise, Bidrin® tank-mixed with Diamond® outperformed Diamond mixed with either acephate or Centric®. (Figure 2).
- Bidrin® mixed with bifenthrin offered a higher level of reduction of TPB compared with Orthene® or acephate mixed with bifenthrin, Endigo®, or Transform® (Figure 3).

Stink Bugs

- Bidrin® alone provided a significantly greater reduction in stink bugs compared with competitive treatments (Figure 4).

Cotton Fleahoppers

- Bidrin® alone provided a similar reduction in cotton fleahoppers compared with competitive treatments (Figure 5).

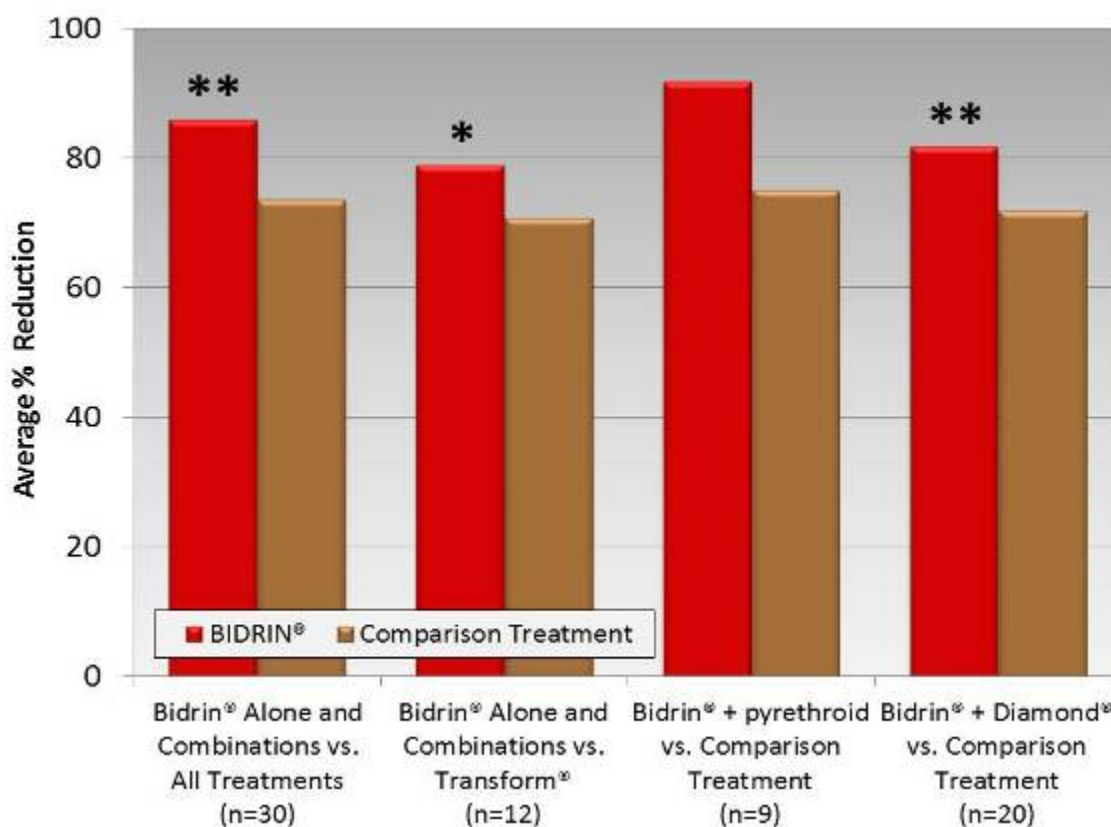


Figure 1. General overview of Bidrin® efficacy in treatment pairings targeting tarnished plant bugs (TPB). Median reduction (%) in numbers of TPB after treatment with insecticides evaluated in Bidrin® demonstration trial program in 2013. Reduction calculated from pretreatment and post treatment counts. N = sample size; based on paired t-test analysis, treatments are significantly different at $P < 0.05$ (**) or $P < 0.1$ (*).

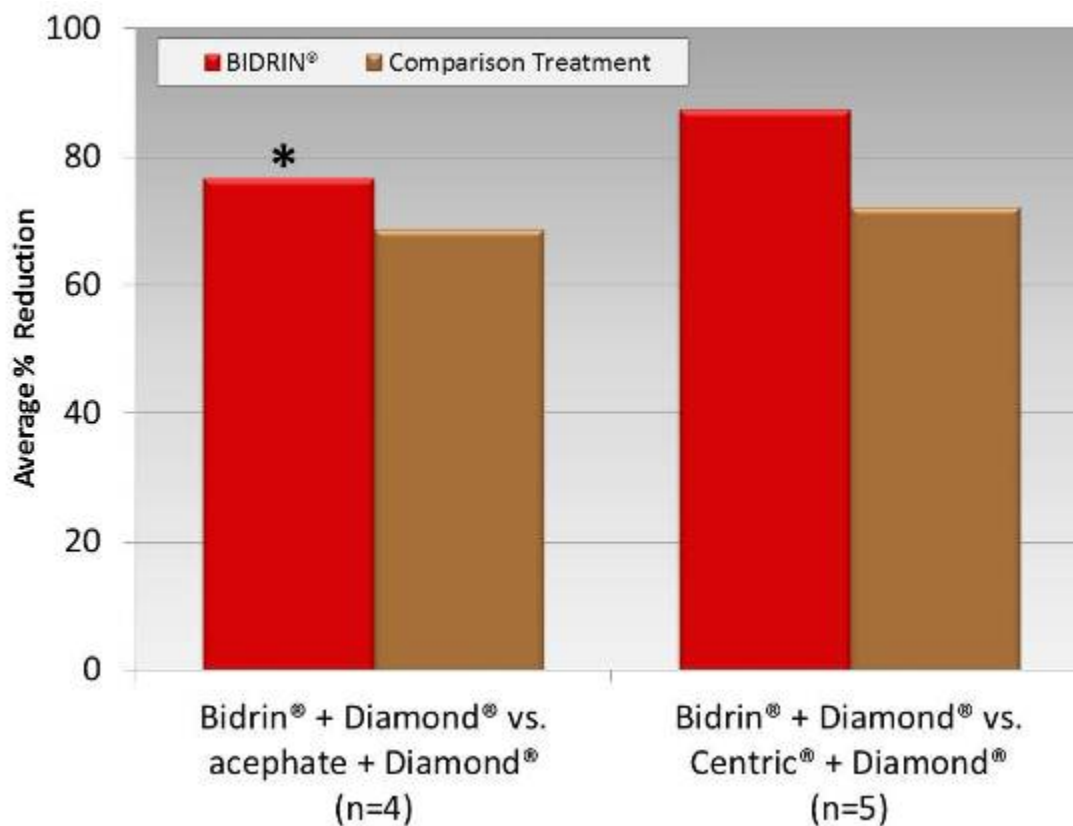


Figure 2. Performance of Bidrin® and Diamond® combinations in treatment pairings targeting tarnished plant bugs (TPB). Median reduction (%) in numbers of TPB after treatment with insecticides evaluated in Bidrin® demonstration trial program in 2013. Reduction calculated from pretreatment and post treatment counts. N = sample size; based on paired t-test analysis, treatments are significantly different at $P < 0.05$ (*).

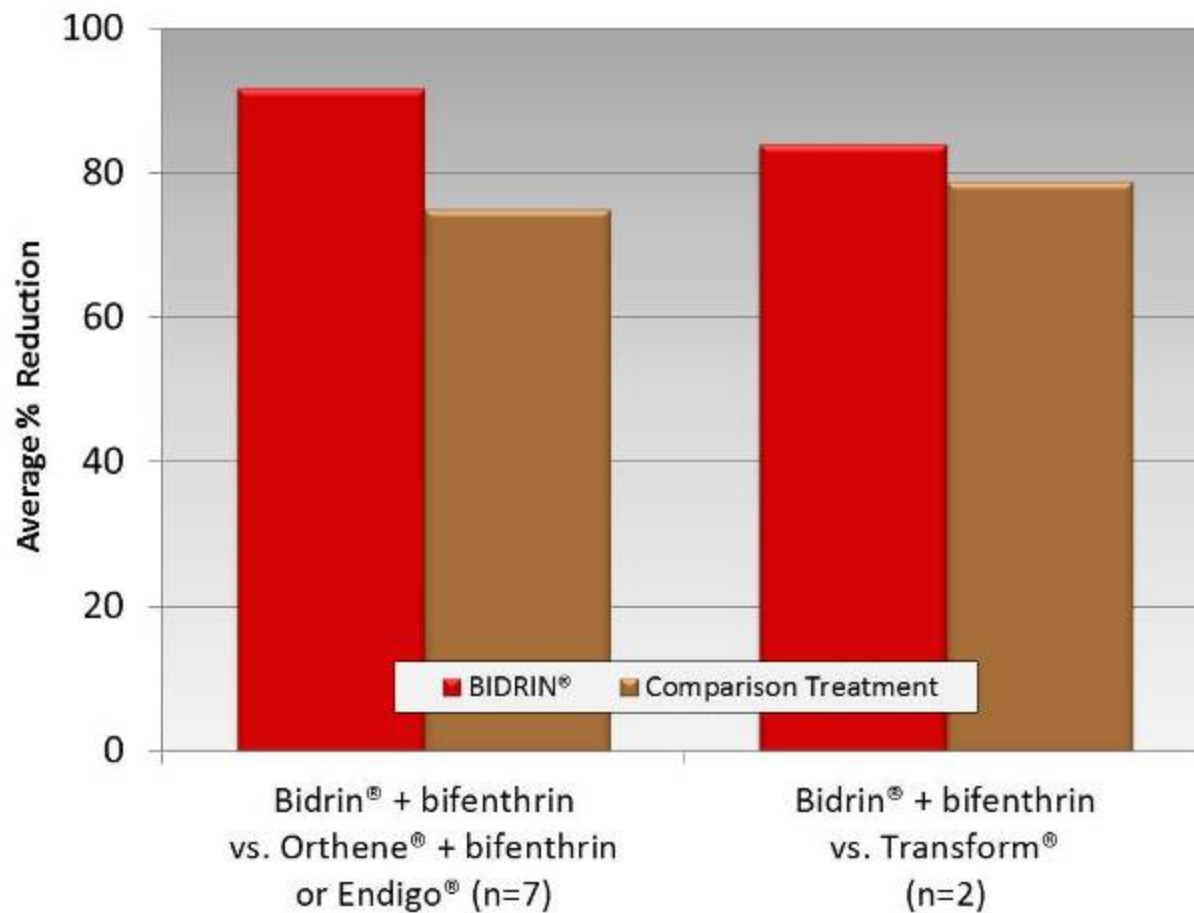


Figure 3. Performance of Bidrin® and bifenthrin combinations in treatment pairings targeting tarnished plant bugs (TPB). Median reduction (%) in numbers of TPB after treatment with insecticides evaluated in Bidrin® demonstration trial program in 2013. Reduction calculated from pretreatment and post treatment counts. N = sample size; based on paired t-test analysis, treatments are significantly different at $P < 0.05$ (*).

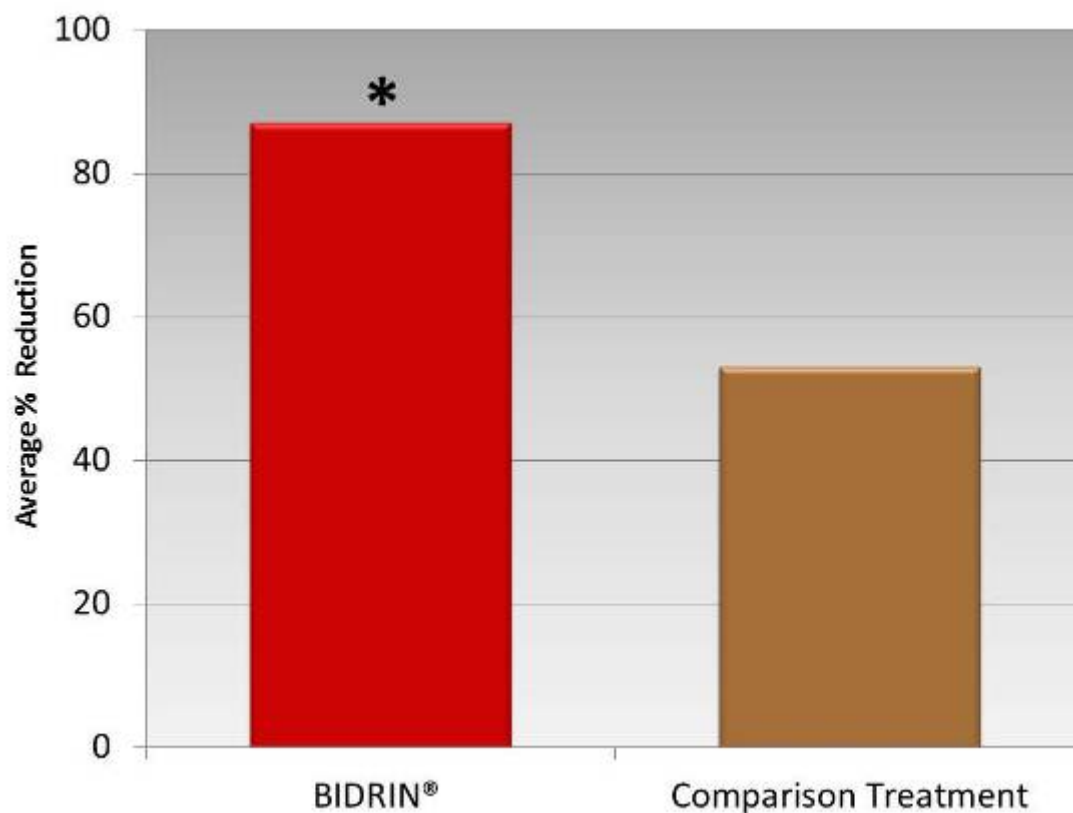


Figure 4. Performance of Bidrin® alone in treatment pairings targeting brown and green stink bugs. Median reduction (%) in numbers of stink bugs after treatment with insecticides evaluated in Bidrin® demonstration trial program in 2013. Reduction calculated from pretreatment and post treatment counts. Based on 12 observations and a paired t-test analysis, treatments are significantly different at $P=0.028$ (*).

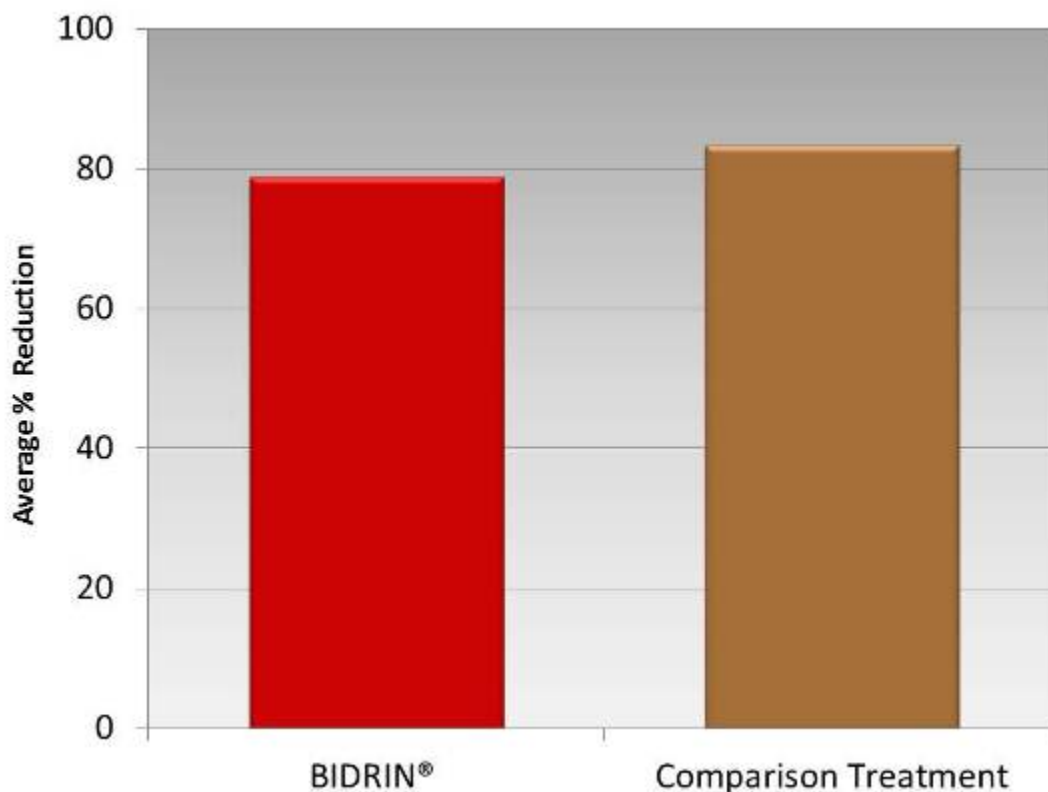


Figure 5. Performance of Bidrin® alone from treatment pairings targeting cotton fleahoppers. Median reduction (%) in numbers of cotton fleahoppers after treatment with insecticides evaluated in Bidrin® demonstration trial program in 2013. Reduction calculated from pretreatment and post treatment counts. Based on 11 observations and a paired t-test analysis, treatments are significantly different at * $P < 0.05$.

Conclusions

An important step in defining and developing product expertise for production agriculture is evaluation by crop protection professionals. In 2013, Bidrin® was assessed in a broad series of commercial evaluations of insecticides utilized in cotton production. Reduction in tarnished plant bugs and stink bugs with Bidrin® was significantly greater than comparison treatments, and against cotton fleahoppers Bidrin® provided performance equivalent to competitive standards. Results from 2013 commercial demonstration field trials confirm other research that Bidrin® is a useful tool for managing infestations of tarnished plant bugs, stink bugs, cotton fleahoppers, and other pests in cotton.

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