**Introduction**

The tarnished plant bug (TPB), *Lygus lineolaris* (Pisolt de Beauvois), is a primary pest in cotton that consistently infests cotton and causes economic losses. Insecticides are a key tool for reducing the impact on TPB infestations in cotton. Bidrin XP II, a premix of the dicrotophos (Bidrin) and bifenthrin (Discipline), pairs the well-established efficacy of Bidrin against pests with piercing and sucking mouthparts with the pyrethroid bifenthrin, known to be particularly active on Lepidopteran pests. This combination is a broad spectrum tool for control of insects in mid to late season cotton. Regional studies were initiated by University or Extension scientists to examine the effects of Bidrin and Bidrin XP II on TPB infesting cotton. Bidrin-based combinations and sequential treatments were compared with commercially available products. Findings are reported.

**Materials and Methods**

**Design.** Each trial was established as a randomized complete block design with four replications. Plots contained 4-8 treated rows of cotton (50 ft. long). Trial locations are summarized in Table 1. Plant growth, weed, and pest management inputs were administered according to locally accepted practices.

**Application.** Trial program was partitioned into two protocols. Project 12C03043 trials evaluated sequential applications of insecticides (Tables 1 and 2). First application was initiated during early bloom after reaching a threshold of 3 TPB per 5 row ft., and a second application was made approximately 7 days later. For Project 12C03044 trials, applications of premixtures and product combinations were made at least 3 weeks into flowering (mid-bloom) and after reaching a threshold for TPB (Tables 1 and 3). Protocol requested subsequent applications on 14-day interval as needed.

**Field Observations.** Counts of total immature and adult TPB, as numbers per sample of 10 row ft. per plot with a black 2.5 ft. drop cloth, were requested at 0, 3, and 7 days after each application. An additional count at 12 days after second application was requested in 12C03043 trials.

**Data Analysis.** Although some locations were excluded from analysis due to light infestations of tarnished plant bug (TPB) and post-treatment observation periods were inconsistent among cooperators, a core group of trials were analyzed for insecticide performance against TPB. After square root transformation, data were subjected to an analysis of variance and Student-Newman-Keuls means separation test (p=0.05, protected).

**Results and Discussion**

Key Findings from 12C03043: Efficacy of Bidrin combinations for control of tarnished plant bug (TPB) in cotton.

- Seasonal average counts of TPB in Untreated Control (UTC) plots were 3-4 times above the treatment threshold of 3 TPB per 5 row ft. (Figure 1).
- All sequential treatments averaged significantly less TPB compared with UTC. Each combination of insecticides averaged a similar reduction in TPB counts, and differences among treatments were small.

Key Findings from 12C03044: Efficacy of Bidrin XP II for control of tarnished plant bug (TPB) in mid to late bloom cotton.

- Following first and second applications of insecticides, average counts of TPB in Untreated Control (UTC) plots were 3 and 7 fold higher, respectively, than threshold (Figure 2).
- Across all trials assessing the efficacy of Bidrin XP II alone and combined with Diamond and Transform, all insecticidal treatments averaged significantly less TPB compared with UTC following each application.
- Following the second application, Bidrin XP II averaged the lowest TPB counts among the premixture products of Endigo, Leverage 360, and Athena. Under intense TPB pressure, combinations of Bidrin or Bidrin XP II with either Diamond or Transform averaged the lowest counts among all insecticide treatments, which translated to 83 to 85% control.
- Adding Diamond or Transform to Bidrin or Bidrin XP II consistently offered a small increase in TPB control compared with Bidrin or Bidrin XP II alone.

**Conclusions**

Across replicated, small plot trials implemented to investigate insecticide efficacy against tarnished plant bug (TPB) in cotton, counts of TPB in the untreated control were typically 3 to 7 fold greater than the established threshold of 3 TPB per 5 row ft., which offered a strong challenge to insecticides evaluated in these studies. Combinations of Bidrin with other insecticides applied sequentially during early bloom provided insect control similar to comparison treatments. Bidrin XP II provided slightly better control compared with other premix insecticides (Endigo, Leverage 360, and Athena), and combinations of Diamond or Transform with Bidrin XP II and Bidrin averaged the lowest TPB counts following the first and second applications. Results from 2012 field trials affirm previous findings; Bidrin and Bidrin XP II are very useful tools for managing infestations of TPB in cotton.

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