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LATE SEASON TARNISHED PLANT BUG CONTROL WITH DIAMOND (NOVALURON)

Charles Guy
Tillar, AR
Alan Dalrymple
Crompton Corp.
Brenham, TX

Abstract

Tarnished plant bug (*Lygus lineolaris*) has become one of the most serious pests in Mid–South cotton. Two field trials were conducted to evaluate plant bug control with Diamond insecticide during 2003 and 2004. Diamond 0.83EC at 9 oz/A provided superior control of plant bug nymphs when compared to Centric at 2 oz/A, Trimax at 1.5 oz/A, and Orthene at 5.3 oz/A in 2004. Adult plant bug control was best with Diamond at 9 oz/A plus Orthene at 7 oz/A. Diamond at 9 oz/A and a tank mix of Diamond at 6 oz/A plus Karate Z at 2 oz/A resulted in excellent plant bug control in 2003.

Introduction

With the wide spread use of Bt cotton and the eradication of the boll weevil (*Anthonomus grandis*), the tarnished plant bug has become a costly and difficult pest to control. There are several insecticides labeled for plant bug control, but few have residual activity, and few work after repeated use.

The primary objective of this research was to evaluate plant bug control with Diamond and other insecticides. Adult and nymph populations were evaluated before and after application. Other data collected included square retention and seed cotton yield.

Materials and Methods

The 2003 trial was initiated as a worm trial, but tarnish plant bug became the pest of concern. Plot size was four 38-inch rows that were 50 feet long replicated four times. Treatments were applied via a hi-cycle with a CO_2 powered sprayer calibrated to deliver 10 GPA. The sprayer's operating pressure was 45 PSI with 6 hollow cone TX-6 nozzles spaced 19 inches apart (only the center two rows effectively sprayed). A modified whole plant search was used to evaluate plant bug control. Ten plants per plot were thoroughly searched down the plant past one node below the first stuck bloom tag. Data collected included the number of plant bugs per plant (adult and nymphs were separated during the last evaluation only). Yield data was obtained by harvesting the center two rows with a machine picker. Means were separated by Duncan's New MRT at P=0.10. Treatments included Diamond 0.83EC at 9 oz/A, Diamond at 6 oz/A plus Karate at 2 oz/a, and Tracer at 1.5 oz/A.

The cotton in the 2004 trial was not irrigated and was approaching 'cut-out' when initiated. Limited new cotton growth occurred during the coarse of the trial. Plot size was twenty-four 38-inch rows that were 750 feet long replicated one time. Treatments were applied via a hi-cycle with a CO_2 powered sprayer calibrated to deliver 6 GPA. The sprayers operating pressure was 22 PSI with flat fan 110015VS nozzles. The entire plot was treated. Adult and nymph plant bug populations were evaluated by making twenty-five sweeps with a 15-inch diameter net from four areas in each plot. Square retention was determined by evaluating the first position fruit at the third node from the terminal on twenty-five plants in four areas per plot. Yield data was obtained by harvesting two rows with a machine picker from three 50-foot areas per plot. Means were separated by Duncan's New MRT at P=0.10. Treatments were Diamond 0.83EC at 9 oz/A, Diamond at 9 oz/a plus Orthene 90S at 7 oz/A, Orthene 90S at 5.3 oz/A, Trimax at 1.5 oz/A, and Centric 40WG at 2 oz/A.

Results and Discussion

Plant bug control was excellent with Diamond applied alone in 2003. Four days after the first application all treatments had less than 2 plant bugs per 10 plants. Four days after the second application the untreated check had 9 plant bugs per 10 plants. Diamond at 9 oz/A had 0.7, Tracer at 1.5 oz/A had 6.7, and Diamond plus Karate at 6 plus

2 oz/A had 1 plant bug per 10 plants. At the end of the trial after four applications the number of adult and nymph plant bugs was significantly reduced when Diamond was applied alone or tank mixed with Karate. At the end of the trial the untreated check had 5.8 nymphs and 2.5 adults per 10 plants. Diamond alone at 9 oz/A had 1 nymph and 1.3 adults per 10 plants. Tracer at 1.5 oz/A had 7.5 nymphs and 1.8 adults on 10 plants. Seed cotton yield was greatest where Diamond was used. The untreated check yielded 1727 lb seed cotton/A, Diamond at 9 oz/A produced 3372 lb/A, Tracer at 1.5 oz/A produced 2656 lb/A, and Diamond plus Karate at 6 plus 2 oz/A yielded 3375 lb/A. Diamond treated cotton yielded more than Tracer treated cotton, indicating that plant bug control was more important than worm control since Tracer is not labeled for tarnished plant bugs.

In the 2004 trial Diamond and Diamond plus Orthene reduced plant bug numbers better than Centric, Trimax or Orthene. At eight days after the first application all of the treatments provided similar control. Diamond at 9 oz/A had 2.8 nymphs and 6 adults per 25 sweeps. The untreated check had 10.5 nymphs and 4.5 adults per 25 sweeps. At eight days after application square retention was 85% with Diamond plus Orthene at 9 plus 7 oz/A. The next best was Diamond alone at 9 oz/A, which resulted in 72% square retention. Centric at 2 oz/A had 42% retention, Trimax at 1.5 oz/A had 55% retention and Orthene at 5.3 oz/A had 62% square retention. By fourteen days after the first application plant bug nymph numbers were reduced the most with Diamond and Diamond plus Orthene. At fourteen days Diamond at 9 oz/A had 8 nymphs per 25 sweeps, the untreated check had 14.5, Centric had 13.8, Trimax had 20, and Orthene had 18 nymphs per 25 sweeps. At four days after the second application the untreated check had 15.3 nymphs per 25 sweeps, Diamond at 9 oz/A had 1.8, Centric had 5.5, Trimax had 13.8, and Orthene had 5.5 nymphs per 25 sweeps. At seven and eleven days after the second application plant bug numbers were declining. Diamond and Diamond plus Orthene reduced the number of plant bug nymphs greater than any of the other treatments at these evaluations. Seed cotton yield was significantly higher with Diamond plus Orthene at 9 plus 6 oz/A (2836 lb/A) when compared to any of the other treatments, and Diamond alone (2454 lb/A) was numerically greater than Centric (2356 lb/A), Trimax (2231 lb/A), or Orthene (2273 lb/A). The untreated control yielded 987 lb seed cotton/A

Conclusions

Diamond was shown to be an outstanding tarnished plant bug insecticide. Results indicated fourteen days of residual control on cotton near ‘cut-out’, which was much better than standard materials like Centric, Trimax and Orthene. Future research will include lower rates applied earlier in the season as well as tank mixes with other insecticides late in the season. Diamond might also work well if a whole community (area) were to apply at the same time.