INSECTICIDES FOR TOBACCO BUDWORM CONTROL

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RESEARCH PROBLEM

Tobacco budworm has been an important pest of cotton in Arkansas for many years. A number of new insecticides are being developed and will soon be available for use against tobacco budworms. Information about the performance of these new insecticides against Arkansas strains of the tobacco budworm is needed.

BACKGROUND INFORMATION

The tobacco budworm causes losses to Arkansas cotton each year. It is an especially troubling pest because of its ability to develop resistance to insecticides (Bagwell *et al.*, 1998; Payne *et al.*,1999). Since its release in 1996, Bollgard cotton has done a good job of controlling the tobacco budworm. Studies have shown increasing tolerance to the *Bacillus thuringiensis* (Bt) toxin used in Bollgard cotton in the cotton bollworm, but not the tobacco budworm (Sumerford *et al.*, 1999). However, other studies have shown that the yields of Bollgard cotton varieties in Arkansas have been variable and sometimes disappointing, particularly in Southeast Arkansas (Bryant *et al.*, 1999a, 1999b, 2000). Yield inconsistency and lower budworm pressure in Northeast Arkansas have driven growers to plant lower percentages of Bollgard varieties as compared with many other Delta and Southeastern cotton states (Williams, 1999). Therefore, many Arkansas growers are relying on foliar insecticides for protection against tobacco budworm populations.

MATERIALS AND METHODS

A test comparing insecticides for tobacco budworm control was planted on the Southeast Branch Experiment Station at Rohwer. Stoneville 474 was planted on 7 June 1999 in four-row plots 40 ft long with two-row unplanted borders between plots using standard production practices. Insecticide applications were applied to test plots using a high clearance sprayer on 13 August, 17 August, 27 August, and 30 August 1999. Insect and damage counts were made 3 days posttreatment on all plots by examining 25 terminals, 25 squares, and 25 small bolls per plot. Eggs, larvae (small, medium, and large), worm damage, boll weevil damage, adult boll weevils, and tarnished plant bug adults and nymphs were counted on each plant part. Heliothine eggs and larvae were

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collected for species identification several times during the test. The HelID test kits (agdia, Inc.) were used to identify eggs, while microscopic examination was used to identify larvae. Lint yields were determined by machine-harvesting the middle two rows of each plot and applying the farm average percent lint turnout of 34%. Data were stored and processed using Agriculture Research Manager Software.

RESULTS

Insect pest populations were generally low during the test. Tobacco budworms comprised 50 to 83% of the heliothine populations present. Insect counts and damage are given in Table 1. No significant differences were seen in the mean number of worms 3 days after treatments. Worm damage levels were lower in the Tracer treatments (both rates) than in the check, the low rate of S-1812 or both rates of Intrepid + Karate. Both rates of Tracer, both rates of Steward, Karate, Denim, and all rates of S-1812 had lower worm damage than that seen in untreated plots. Only Karate had statistically fewer tarnished plant bug adults than the untreated check plots. Against tarnished plant bug nymphs, only the Steward treatments performed statistically better than untreated check plots. When both adults and nymphs were considered, only the Steward treatments had significantly lower populations than were present in the untreated check plots. Lint yields were significantly higher in the high rate Steward treated plots than in other plots (Table 1).

PRACTICAL APPLICATION

In 1999, treatments that were most effective in reducing tarnished plant bug numbers were the highest yielding treatments. In both 1998 and 1999, plots treated with Steward at 0.11 lb ai/acre produced consistently high yields in late-season tobacco budworm tests in which tarnished plant bugs have been a yield limiting factor (Kharboutli *et al.*, 1999).

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Table 1. Seasonal mean insect pest counts and damage per sample[z] and lint yield per acre.

Insecticides	Rate	Worms	Worm Damage	Tarnished Plant Bugs Adults	Tarnished Plant Bugs Nymphs	Tarnished Plant Bugs Total	Lint Yield
	lb ai/acre						lb/acre
Steward	0.11	0.90 a[y]	1.15 cd	0.43 de	0.68 d	1.00 f	1016 a
Karate Z + Penetrator Plus	0.033 + 0.5 (pt)	2.10 a	1.15 cd	0.20 e	1.28 cd	1.44 def	833 b
Steward	0.09	2.55 a	2.03 bcd	0.62 cde	0.62 d	1.12 ef	820 b
Intrepid + Karate Z + Penetrator Plus	0.1 + 0.033 + 0.5 (pt)	1.88 a	2.70 ab	0.60 cde	1.42 bcd	1.94 def	787 b
Tracer	0.045	0.825 a	1.02 d	0.58 cde	1.65 abcd	2.12 def	786 b
Intrepid + Karate Z + Penetrator Plus	0.15 + 0.033 + 0.5 (pt)	1.05 a	2.78 ab	0.38 de	1.72 abcd	2.00 def	784 b
S-1812	0.05	1.88 a	2.42 bc	1.88 a	1.98 abc	4.19 ab	767 b
Denim	0.01	1.05 a	1.38 cd	1.3 abc	1.38 bcd	2.56 cde	765 b
Check	----	3.35 a	3.82 a	1.08 bcd	1.98 abc	2.88 bcd	755 b
S-1812	0.075	2.72 a	1.8 bcd	1.85 a	2.70 a	4.44 a	730 b
S-1812	0.060	3.08 a	2.18 bcd	1.48 ab	2.35 abc	3.75 abc	728 b
Tracer	0.067	0.52 a	1.00 d	0.75 bcde	1.88 abc	2.5 cdef	700 b

[z] A sample was a visual examination of 25 terminals, 25 squares, and 25 small bolls.

[y] Means followed by the same letter are not significantly different (P<.05).