EVALUATION OF INSECTICIDES FOR CONTROL OF SOYBEAN AND CABBAGE LOOPERS ON COTTON IN SOUTHEAST ARKANSAS

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RESEARCH PROBLEM

Loopers occur each year in a few cotton fields in Southeast Arkansas, and occasionally, serious outbreaks occur. Insecticides are used to control loopers and prevent economic loss. However, because loopers are rarely treated, limited information is available on what insecticides are effective against them. It is imperative that available insecticides for looper control be regularly monitored to manage resistance. Also, new insecticides have been introduced for looper control, and farmers need adequate information about their efficacy.

BACKGROUND INFORMATION

The soybean looper *(Pseudoplusia includens* Walker) and the cabbage looper *(Trichoplusia ni* Huebner) are occasional pests of cotton in Southeast Arkansas. Although cotton is not their preferred host, the cotton crop can be attacked by loopers as a source of nectar for the adults (Jensen *et al.*, 1974) and as a probable site for the development of insecticide resistance (Thomas and Boethel, 1994). Normally, loopers do not greatly influence cotton yield in Arkansas, but they can become a problem late in the growing season and cause extensive defoliation damage. Moreover, the pest status of loopers in the Arkansas cotton agroecosystem may soon change with the initiation of the boll weevil eradication program and the adverse effects on the natural enemies of widespread malathion sprays. The increased usage of *Bacillus thuringiensis* (Bt) cotton may also be conducive to having more looper outbreaks in cotton because of the reduced susceptibility of soybean looper to Bt (Mascarenhas *et al.*,1997) on one hand and, on the other hand, the reduced number of insecticide applications against Heliothines that controlled loopers. Due to the development of resistance in loopers to pyrethroids (Leonard *et al.*, 1990), new chemistries such as Pirate and Tracer, with modes of action different from those of pyrethroids, have been developed for looper control. This study was conducted to provide efficacy information on selected traditional, new, and experimental foliar insecticides for control of soybean and cabbage looper.

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RESEARCH DESCRIPTION

The study was conducted in 1999 in Desha County on the Southeast Branch Experiment Station (SEBES) near Rohwer. A field of looper-infested DPL 5415 cotton that was planted on 21 May 1999 was used. The test was conducted using a randomized block design with four replications of each treatment. Plots were 25 ft long by 2 rows wide with a border row between treated plots. Treatments were applied on 17 September using a CO_2-charged hand-boom sprayer calibrated to deliver 10 gal/acre at 40 psi, using two hollow cone nozzles (Tx4) per row. Insects were counted at 3 and 7 days after application by taking two beat sheet samples (6 row ft) in each plot. Data were processed using the Agriculture Research Manager (ARM), an analysis of variance was run, and the least significant difference used to separate the means ($P = 0.05$).

RESULTS AND DISCUSSION

The high rate (0.2 lb ai/acre) of the experimental compound RH-2485 (Intrepid) was the only treatment that significantly reduced soybean looper counts at both 3 and 7 days after treatment application compared with the untreated check (Table 1). In addition to the initial population suppression, RH-2485 at all rates used exerted increased control with time, indicating enhanced residual activity as compared to the other treatments. Soybean looper counts in plots treated with RH-2485 (0.2 lb ai/acre) were 4 and 15.6 times smaller than those in the untreated check plots at 3 and 7 days after treatment, respectively. Treatments such as Larvin and Lannate reduced looper counts to half the level seen in the check plots and were noticeably more effective than Orthene or Confirm. When data were analyzed across sampling dates, all treatments except Confirm and Orthene significantly reduced soybean looper counts compared with the check (Table 1).

None of the insecticides significantly reduced cabbage looper counts on any sampling date or across sampling dates (Table 1). However, some treatments such as RH-2485, Confirm, and Tracer tended to reduce cabbage looper counts compared with the untreated check. Orthene, the weakest of all treatments, had no or little activity on cabbage looper 7 days after treatment. Populations were numerically higher in Orthene-treated plots than in untreated check plots (Table 1).

No significant differences in saltmarsh caterpillars existed among treatments 3 days after treatment (Table 1). At 7 days after treatment, all insecticides significantly reduced caterpillar counts compared with the check. When data were analyzed across sampling dates, no significant differences in caterpillar counts were shown to exist among treatments (Table 1). Saltmarsh caterpillar counts were relatively low in this test. That may have influenced the outcome of the test by masking the control potential of some of the insecticides used.

PRACTICAL APPLICATION

Traditional insecticides such as Larvin and Lannate continue to be effective against soybean and cabbage loopers. However, the experimental insecticide RH-2485 (Intrepid) with its new chemistry, gave the best control of both soybean and cabbage loopers. It enhanced residual activity and appeared to be superior to Larvin or Lannate. Confirm was intermediate in its activity against loopers, while the level of control provided by Tracer was not adequate. Orthene had no or little activity on loopers. Saltmarsh caterpillar populations were relatively low in our test plots and a meaningful efficacy comparison of treatments could not be obtained.

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Table 1. Effect of insecticides on soybean looper, cabbage looper, and saltmarsh caterpillar. Rohwer, AR, 1999.

		Soybean Looper			Cabbage Looper			Saltmarsh Caterpillar		
Treatment	Rate	3 DAT[z]	7 DAT	Summary	3 DAT	7 DAT	Summary	3 DAT	7 DAT	Summary
	lb ai/acre									
Check	-	38.8 a[y]	12.5 a	25.6 a	8.8 a	0.8 b	4.8 a	1.0 a	1.3 a	1.13 a
Orthene 90SP	0.9	37.0 ab	12.3 a	24.6 a	6.8 a	3.8 a	5.3 a	0.3 a	0.3 b	0.25 a
Confirm 2F	0.12	23.3 ab	8.8 ab	16.0 ab	3.3 a	1.8 ab	2.5 a	0.8 a	0.0 b	0.38 a
Tracer 4SC	0.067	17.3 ab	8.0 ab	12.6 b	3.5 a	1.3 b	2.4 a	0.3 a	0.5 b	0.38 a
Lannate LV 2.4SL	0.6	13.8 ab	7.8 ab	10.8 b	8.8 a	2.8 ab	5.8 a	0.3 a	0.0 b	0.13 a
Larvin 3.2SC	0.6	13.5 ab	6.5 ab	10.0 b	4.5 a	2.5 ab	3.5 a	1.0 a	0.0 b	0.5 a
RH-2485 80WP + Penetrator Plus[x]	0.05	13.3 ab	2.5 ab	7.9 b	3.0 a	0.3 b	1.6 a	0.3 a	0.0 b	0.13 a
RH-2485 80WP + Penetrator Plus	0.1	13.3 ab	3.0 ab	8.1 b	1.8 a	0.3 b	1.0 a	0.3 a	0.3 b	0.25 a
RH-2485 80WP + Penetrator Plus	0.2	9.8 b	0.8 b	5.3 b	2.8 a	0.0 b	1.4 a	0.3 a	0.3 b	0.25 a

[z] DAT = days after treatment.

[y] Means in columns followed by the same letter are not significantly different (P = 0.05, LSD).

[x] Penetrator Plus used at the rate of 0.5 pt/acre.