MANAGEMENT OF SECONDARY PESTS IN SOUTH CAROLINA COTTON

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Abstract

Secondary pests of concern in South Carolina cotton include stink bugs, armyworms, and soybean looper. Stink bug control is usually maintained by multiple pyrethroid sprays applied for cotton bollworm. Methyl parathion is added to these pyrethroid bollworm sprays when stink bugs exceed recommended thresholds. The beet armyworm is the dominant armyworm species; none of the currently recommended chemicals will consistently control this pest. Two new compounds, Pirate and Confirm, have given adequate control on established populations. Efficacy trials in 1995 indicated Pirate to be the best material against beet armyworm. With soybean looper, none of the currently recommended chemicals provide adequate control. Of the new compounds tested only Pirate provided adequate control of this pest.

Introduction

The primary insect pest attacking cotton in South Carolina is cotton bollworm (Helicoverpa zea); it has been and continues to be adequately controlled by use of synthetic pyrethroids (Sullivan, et al. 1993). Main secondary pests for the past three years include three stink bug species (brown, green, and southern green); armyworms (beet and fall) and soybean looper. Of these , beet armyworm larvae, Spodoptera exigua, have been the cause of most concern by South Carolina growers (Sullivan, et.al. 1991), although fall armyworms can be a problem (Smith, et.al., 1993). Previous studies indicated less than desirable results with any recommended materials and no biological material provided adequate control. This same scenario has been seen in succeeding years.

Until 1992, the beet armyworm had occurred in isolated areas of the state. Since that time, we have seen steadily increased pressure, particularly in the southern half of our cotton growing regions; during this same time frame, cotton acreage in this area has increased dramatically. Infestations usually occur in July/August and are associated with drought conditions.

Three stink bug species attack cotton in South Carolina, brown (Euchistis servus), green (Acrosternum hilare) and southern green (Nezara viridula). They are found in cotton from bollset (June/July) until cutout(Sept.). Synthetic pyrethroids, applied in July and August for bollworm management, do an effective job of controlling all three species (personal observations). When thresholds are exceeded during this time frame, methyl parathion (.5 lb.ai/ac) is added to a pyrethroid spray. Methyl parathion continues to be an economical and effective control for all three species.

Soybean looper, Pseudoplusia includens, are not normally found in numbers high enough to warrant insecticide treatment. They usually occur in late August/early September in late planted, rank cotton. Previous studies (Sullivan et.al., 1992) have indicated control problems with currently available materials. Observations in grower fields since that time indicate continuing problems with control of this sporadic pest.

Williams (1995) compiled cotton insect losses for 1994 and South Carolina reported 18% of 216,000 acres were infested above treatment thresholds for the above combined pests. In a continuing effort to provide South Carolina growers with good management strategies for these pests, studies were conducted in 1995 using new insecticides which will soon be available as well as currently recommended materials.

Materials and Methods

In the four tests included in this report, all chemicals were applied as foliar sprays. Results are reported as percent control 2 - 7 days after treatment (DAT) determined by counting larvae using the shake cloth sample method. Test 1 (Table 1) was a small plot, replicated test with 8 row plots, 30 ft. long, with the middle 6 rows treated using a CO_2 backpack sprayer, 8.9 gpa, 60 psi. There were 4 replications in a RCB design. Tests 2 - 4 (Tables 2 and 3) were unreplicated strip tests with applications being made using a John Deere Hi-Cycle sprayer, 5.5 gpa, 80 psi.. Strips in tests 2 and 3 were 18 rows wide. In test 4, a 60 acre block was treated with Pirate, 10 acres treated with Lannate, and two 18 row plots were left untreated within both treatment areas. Spray volume was 5.8 gpa at 80 psi.

In test 1, 2 three ft. shakes were taken in each rep. for a total of 8/treatment. In the other 3 strip tests, 20 shakes were taken in each treated area.

Results and Discussion

Test 1: Both beet armyworm and soybean looper were present in this field (Table 1). At 5DAT, a high rate of Pirate (.35ai) provided the best control of both pests; 89% control BAW and 88% control SBL. A single Dimilin (8 oz.) application gave 79% control of BAW followed by Confirm (8 oz.) with 70%. A combination of Larvin (.8ai) + Dimilin (8 oz.) provided 60% control of BAW. The virus, Spod - X (250 ml.) had 65% control. At this time the BAW population in the untreated check was 4.7/row ft.

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with SBL larvae, only Pirate (.35 ai) provided adequate efficacy.

At 7 DAT, all treatments except Spod - X (250 ml.) gave 80:% control or better of BAW with Pirate (.35 ai) and Confirm (8 oz.) providing 93 and 90 % control respectively. With SBL, Pirate (.35 ai) again was the only treatment that controlled this pest.

Table 2 presents data on BAW efficacy in two separate strip tests in Hampton County. Pirate (.2 ai) provided the best control in both tests. In field 1, Confirm (8 oz.) gave 92% control but only 74% in field 2. A combination of Larvin (.4 ai) and Dimilin (8 oz.) gave 78 and 70% control in field 1 and 2 respectively. The combination of Curacron (1.0 ai) and Lorsban (.5 ai) gave 79% control of BAW in field 1 but only 32% in field 2. The combination of Larvin (.4 ai) and Ovasyn (.19ai) was not effective.

Pirate (.2 ai) did an excellent job of controlling a high population of SBL at 4DAT.. (Table 3). Lannate (.375 ai) only gave 34% control at 2 DAT and was not counted 4DAT..

With BAW, the authors observed several grower fields that were treated with various insecticides. South Carolina obtained a Section 18 for use of Confirm; in fields treated with this material, % control ranged from 60 - 80. Other materials used by growers included Dimilin and Larvin; none of these provided adequate control. From these observations and based on our limited test results, Pirate (.2 ai) is the best material for BAW control followed by Confirm (8 oz.). Our results are similar to those reported from Mississippi (Furr and Harris, 1995).

In the case of SBL, observations in grower fields and our test results indicate Pirate (.2 ai) to be the most efficacious material currently available. High populations of this pest usually occur in late planted cotton and late in the growing season (September). The best control mechanism in South Carolina is a naturally occurring virus that eliminates these late developing SBL populations.

The third secondary insect pest currently causing problems in South Carolina cotton is stink bug. Three species (brown, green, and southern green) are commonly found with green and brown stink bug being found most frequently. These can occur in the months of July, August, and September. In July and August, most cotton in South Carolina is being treated for our primary insect pest, cotton bollworm, with synthetic pyrethroids on a 6 - 12 day interval depending on bollworm pressure. Stink bugs are usually controlled by these pyrethroids (personal observations, data not presented in this report). If stink bugs exceed treatment thresholds during this time frame, methyl parathion (.5 ai) is added to the pyrethroid bollworm spray. Methyl parathion is an economical and effective control measure for all three species of stink bug.

References

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Table 1. Percent control of beet armyworm and soybean looper larvae in small plot replicated test. Bamberg County, S.C. 1995.

Treatment (Rate)	% Control 5DAT		% Control 7DAT	
	BAW	SBL	BAW	SBL
Pirate (.35 ai)	89	88	93	91
Confirm (8 oz.) Larvin (.8 ai)+ Dimilin (8 oz.)	70	10	90	34
Dimilin (8 oz.)	60	42	80	45
Spod X (250 ml.)	79	0	83	36
UTC[1]	4.7	10.0	1.7	7.8

[1]In untreated check, the mean number of larvae/row ft. is given based on shake cloth samples.

Table 2. Percent control of beet armyworm larvae in unreplicated strip test. Hampton County, S. C. 1995.

Treatment (Rate)	% Control - 6DAT	
	Field 1	Field 2
Pirate (.2 ai) Larvin (.4 ai) + Dimilin (8 oz.)	100	87
Curacron (1.0 ai) + Lorsban (.5 ai)	78	70
Confirm (8 oz.) Larvin (.4 ai) + Ovasyn (.19 ai)	79	32
UTC[1]	92	74
	- - -	48
	2.4/row ft.	2.8/row ft.

[1] In untreated check, the mean number of larvae/row ft. is given based on shake cloth samples.

Table 3. Percent control of soybean looper larvae in unreplicated strip test. Bamberg County, S. C. 1995.

Treatment (Rate)	**% Control**	
	2DAT	**4DAT.**
Pirate (.2 ai)	61	94
Lannate (.375 ai)	34	- -
UTC[1]	9.7/row ft.	6.5/row ft.

[1] In untreated check, the mean number of larvae/row ft. is given based on shake cloth samples.