LATE SEASON CONTROL OF BOLL WEEVIL

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Abstract

Carbamate, organophosphate, and pyrethroid insecticides were compared for efficacy and yield in Lonoke county, Arkansas. Both in 1994 and 1995 pyrethroids in general had better control of boll weevil than organophosphate and carbamate insecticides. In particular, Baythroid at low and high rates provided superior control compared to Vydate C-LV at 0.25 lb ai/A and Guthion 2L at 0.25 lb ai/A.

Introduction

The boll weevil, *Anthonomus grandis grandis*, continues to be a dominant insect pest in Arkansas and throughout much of the cotton growing regions of the U.S.. Conventional insecticides continue to be the producers first line of defense against the resilient boll weevil. Eradication efforts if passed by producers will probably not be implemented for several years and currently there are no state-of-the-art biotechnology products for the boll weevils such as the Bt gene used against the tobacco budworm/ bollworm complex. Pheromone attract and kill systems such as the BWACT tube have yet to be a proven effective. The continued lack of alternative control techniques will keep conventional insecticides as an integral part of a producers program in the near foreseeable future. Our objective is to evaluate the efficacy of several insecticides and insecticide combinations. In our tests carbamate, organo-phosphate, and pyrethroid insecticides were compared for efficacy in Lonoke county, Arkansas.

Materials and Methods

Field tests on insecticide efficacy were conducted 1991 through 1995. Cotton was planted in early May in Lonoke County, Arkansas. Long season varieties, DPL 90, DPL 5415 and DPL 5690 were used to insure adequate fruit for evaluation during late season peak weevil populations. A single row was mowed to separate each plot to hamper boll weevil migration from plot to plot. This has been observed to be an effective deterrence to migration.

Foliar insecticides were applied using a John Deere 6000 hi-cycle equipped with a CO_2 sprayer. Total spray volume for all years was between 7 -9 gal/acre at 25 psi using Teejet TX-6 or TX-8 hollowcone nozzles on 19 inch spacing at 3.5 MPH. Insecticide treatments began when damage to squares and terminals reached an average of 15-20 percent. Plots consisted of 12 rows (38 inch centers) X 50 ft. Treatments were arranged in a RCBD with 4 replications. Ratings were made 2-3 DAT by examining 25 squares/plot for boll weevil damage. The center two rows of each plot were harvested on using a John Deere 2-row picker. Square damage data collected 1994 and 1995 will be presented in this paper.

In 1994, insecticides were applied on 14, 22 , 25, 29 Aug and 1 Sept. Treatments included Phaser 3.0 EC [.25 lb AI/acre]; Phaser,3.0 EC [.375 lb AI /acre]; Phaser,3.0 EC [.50 lb AI/acre]; Guthion,2.0 L,[.25 lb AI/acre]; Baythroid,2.0 EC [.028 lb AI/acre]; Karate,1.0 EC [.025 lb AI/acre]; Methyl Parathion,4.0 EC [.5 lb AI/acre];FiproniL,80 WG,[.05 lb AI /acre]; Fipronil, 80 WG [.068 lb AI/acre]; Vydate,3.77 EC [.25 lb AI]; Baythroid,2.0 EC [.022 lb AI/acre]; Untreated.

In 1995, insecticides were applied on 11, 19, 22, 26, and 29 Aug. Treatments included Fury 1.5 EC [0.0375 lb AI/acre]; Karate 1 EC [0.028 lb AI /acre]; Baythroid 2 EC [0.028 lb AI/acre]; Regent 80 WG [0.05 lb AI/acre]; Regent 80 WG [0.068 lb AI/acre]; Penncap-M 2 E [0.25 lb AI/acre]; FCR4545 1 EC [0.014 lb AI/acre]; Guthion 2 L [0.25 lb AI/acre]; Guthion 2 L [0.258 lb AI/acre] + Orthene 90 SP [0.5 lb AI/acre]; Vydate 3.77 LV [0.25 lb AI/acre]; Vydate 3.77 LV + [0.25 lb AI /acre]; Orthene 90 SP [0.5 lb AI/acre].

Results and Discussion

In 1994 Baythroid was the only treatment that had significantly fewer damaged squares after the first treatment. After the third spray all treatments had significantly fewer damaged squares.

In 1995, Fury, Karate, Baythroid and both rates of Regent had significantly fewer damaged squares when compare to the untreated check. After the second spraying all but Fury treated plots had fewer damaged squares when compared to the untreated check.

In both 1994 and 1995 tests the pyrethroids in general had fewer damaged squares when compared to the carbamates and organophosphates

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Table 1. Mean number of boll weevil damaged squares per 25 squares checked in 1994.

Treatment	Mean No. Damage Squares				
	4 Aug	8 Aug	11 Aug	15 Aug	22 Aug
Phaser	3.75 ab	3.75 de	1.50 b	7.5 b	13.75 b
Phaser[1]	5.25 ab	4.75 cde	2.50 b	6.0 bc	14.50 b
Phaser	6.00 ab	4.25 cde	2.50 b	4.3 bcd	11.25 b
Guthion	7.50 a	5.50 cde	2.00 b	3.0 bcd	9.75 bc
Baythroid	3.25 b	2.50 e	1.75 b	1.0 d	2.25 d
Karate	5.75 ab	4.75 cde	1.75 b	1.3 cd	5.00 d
Methyl P.	5.25 ab	9.75 a	2.50 b	2.5 cd	3.50 d
Fipronil	6.25 ab	7.25 abc	2.00 b	5.3 bcd	6.25 cd
Fipronil[1]	7.00 ab	5.75 b-e	2.25 b	3.5 bcd	4.75 d
Vydate	5.00 ab	6.25 bcd	2.75 b	2.8 bcd	11.25 b
Baythroid	6.00 ab	6.75 a-d	2.50 b	2.0 cd	3.00 d
Untreated	5.00 ab	9.00 ab	5.75 a	13.3 a	20.25 a

Means followed by same letter do not significantly differ (P=.05, Duncan's MRT)

[1]Treatment at the higher rate.

Table 2. Mean number of boll weevil damaged squares per 25 squares checked in 1995

Treatment	Mean No. Damage Squares				
	14 Aug	22 Aug	25 Aug	29 Aug	1 Sept
UTC	7.75ab	17.5a	9.25ab	5.25a	10.5a
Fury	2.5d	12.75abc	7.5abc	1.75b	1.75b-e
Karate	3.25cd	7.25de	6.0bcd	2.5ab	0.25e
Baythroid	2.5d	4.25e	3.0d	1.75b	1.25de
Regent	3.5cd	9.25cde	6.75abc	3.25ab	2.25b-e
Regent [1]	2.75cd	6.5de	7.5abc	4.25ab	1.5cde
Penncap-M	8.25ab	15.5ab	9.25ab	4.0ab	4.25bcd
FCR4545	1.75d	5.5e	4.5cd	3.0ab	1.0de
Guthion	8.75a	16.25ab	10.0a	5.25a	9.5a
Guthion + Orthene	5.75a-d	14.0abc	8.75ab	4.0ab	5.0bc
Vydate	6.75abc	14.25abc	8.0ab	5.0a	5.25b
Vydate + Orthene	4.5bcd	11.0bcd	6.75abc	3.0ab	4.0bcd

Means within a column followed by the same letter do not significantly differ (P=0.05;DRMT)

[1]Treatment at the higher rate.