

COMPARISON OF INSECTICIDES FOR COTTON APHID CONTROL

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Abstract

Standard insecticides for cotton aphid control still work relatively well in Southeast Arkansas. A trend was present in the 1999 data, however, which may indicate increased tolerance to Furadan and Bidrin. More aphids survived the lower rates of these products than in previous years.

Introduction

Cotton aphids occur on cotton every year in Arkansas. Normally, the aphids do not cause much yield or quality damage before their populations collapse. The primary reason for the aphid population collapse in Arkansas is a disease caused by the insect parasitic fungus, *Neozygites fresenii*. However, each year some fields develop large populations of aphids and insecticides are needed to prevent yield losses. The development of insecticide resistance in cotton aphid populations leaves growers, consultants, and county agents wondering if the insecticide they have chosen for aphid control will be effective. This study was conducted in order to provide data on the relative performance of insecticides used for aphid control.

Methods and Materials

Each year 1996-1999, cotton aphid control studies have been conducted in Southeast Arkansas. Studies from 1996, 1997 and 1999 will be presented in this paper. These studies were conducted on the Scott Day Farm near Winchester, AR., the Paul Johnson Farm near Grady, AR. and the Southeast Branch Experiment Station near Rohwer, AR. in 1996, 1997 and 1999, respectively. The cotton variety used all three years was DPL NuCotn 33B. Planting dates were 4-27-96, 5-3-97 and 5-22-99. In each case, the fields were farmed using standard production practices used for production of irrigated cotton in Southeast Arkansas. Plots were 2 rows wide by 25 feet long and were separated by one border row. Treatments were randomly assigned to plots using Randomized Complete Block Designs. Treatments were applied on 7-12-96, 7-23-97 and 6-30-99. Insecticides were applied using CO₂ charged back-pack spray equipment. Total spray

solution applied was 6.3 gallons/acre in 1996, 12.1 gallons/acre in 1997 and 10.0 gallons/acre in 1999.

Data were collected by randomly selecting five top and five middle canopy main-stem leaves per plot and counting/estimating the number of cotton aphids present at various times posttreatment. The data were processed using PRM and ARM statistical software. Analysis of Variance and LSD ($P \geq .05$) were used to determine differences among treatments.

Results

Data from all tests show insecticide treated plots had significantly fewer aphids present than did untreated plots. In the 1996 test, Furadan at two rates, Lannate at two rates, Bidrin + Ovasyn, Provado at two rates and Bidrin at two rates provided aphid suppression below 100 aphids/leaf and did not differ statistically in aphid control. In the 1997 and 1999 tests, all insecticide treatments were statistically equal.

Conclusions

Several insecticides have provided good cotton aphid control in Southeast Arkansas since 1996. Furadan and Lannate have consistently performed well, as have Bidrin and Provado. Trends in the data appear to show weaker Furadan and Bidrin performance at lower application rates in 1999, as compared with earlier years.

Actara, Bidrin + Provado, Leverage and Fulfill, the newer products and combinations, appear to show promise for aphid control.

Summary

The standard aphid insecticides continue to provide control of cotton aphid populations in Southeast Arkansas.

Acknowledgments

The authors wish to thank Sheila Willis, Fran Tomerlin, Miranda Greer, Cori Treat, Cari Russell, Amy Gibson, and our chemical company cooperators for their work and cooperation in conducting this study.

Table 1. Aphid control^{1,2} with insecticides in 1996. Winchester, AR.

Insecticide	Rate LBS A.I./A	Aphids per Leaf
Check	--	322 a
Orthene 90S + Lorsban 4E	0.045 + 0.25	188 b
Dimethoate 4EC	0.25	143 bc
Bidrin 8	0.25	80 cd
Provado 1.6 F	0.25	60 cd
Bidrin 8	0.5	60 cd
Lannate LV	0.126	43 d
Provado 1.6 F	0.047	40 d
Bidrin 8 + Ovasyn 1.5	0.45 + 0.25	29 d
Lannate LV	0.248	19 d
Furadan 4F	0.125	10 d
Furadan 4F	0.25	9 d

¹Summary of 1-DPT and 3-DPT data.

²Means followed by the same letter are not significantly different ($P \geq .05$).

Table 2. Aphid control^{1,2} with insecticides in 1997. Grady, AR.

Insecticide	Rate LBS A.I./A	Aphids per Leaf
Check	--	119 a
Provado 1.6 F	0.026	43 b
Provado 1.6 F	0.047	35 b
Bidrin 8	0.25	22 b
Bidrin 8	0.5	17 b
Provado 1.6 F	0.073	16 b
Lannate LV	0.15	12 b
Lannate LV	0.3	8 b
Furadan 4F	0.25	5 b
Furadan 4F	0.5	4 b

¹Summary of 1-DPT, 2-DPT and 3-DPT data.

²Means followed by the same letter are not significantly different ($P \geq .05$).

Table 3. Aphid control^{1,2} with insecticides in 1999. Rohwer, AR.

Insecticide	Rate LBS A.I./A	Aphids per Leaf
Check	--	345 a
Bidrin 8	0.33	195 b
Fulfill 50 WG + Kinetic HV	0.086	171 b
Bidrin 8	0.5	167 b
Provado 1.6 F + Kinetic HV	0.025	120 b
Provado 1.6 F + Kinetic HV	0.047	106 b
Furadan 4F	0.125	83 b
Leverage + Kinetic HV	2.8 oz ³	72 b
Bidrin 8 + Provado 1.6 F	0.33 + 0.25	68 b
Actara 25 WG	0.023	60 b
Furadan 4F	0.25	48 b
Actara 25 WG	0.046	39 b

¹Summary of 1-DPT, 2-DPT and 3-DPT data.

²Means followed by the same letter are not significantly different ($P \geq .05$).

³Leverage rate given in ounces/acre because it is a product which contains two active ingredients.