

**COTTON APHID INFESTATIONS IN
MISSISSIPPI: EFFICACY OF SELECTED
INSECTICIDES AND IMPACT ON YIELD**

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Abstract

Eleven insecticide treatments were evaluated for efficacy against cotton aphid. Treatments containing Bidrin, Metasystox-R, Lannate, or Provado provided in excess of 90% control at 2 DAT, but aphid populations recovered rapidly following treatment. Treatments providing best overall control were Bidrin at 0.5 lb AI/A and Lannate at 0.45 lb AI/A. Infestation level in the untreated check was extremely heavy, exceeding 800 aphids/leaf at one point and persisting at high levels for more than 3 weeks before being controlled by a natural fungal epizootic. This prolonged, heavy aphid infestation resulted in a yield reduction of 220 lbs. of lint per acre.

Methods

Eleven insecticide treatments were evaluated for efficacy against cotton aphid at an on-farm site in Leflore County, MS. The trial was conducted in Stone-ville 474 cotton planted on 38-inch row spacings. Treatments were applied using a CO₂ powered backpack sprayer calibrated to deliver 10 gallons of finished spray per acre at 38 PSI. Each treatment was replicated 4 times in a randomized complete block design with plots being 8 rows wide by 40 feet long. Treatments were applied on 14 June, 1995, at which time plants were at the 8th node stage and pre-treatment counts averaged 632 aphids per leaf.

Plots were evaluated at 2, 5, 9, and 15 days after treatment (DAT) by randomly sampling 10 leaves per plot and counting the number of aphids on the underside of each leaf. However, when the number of aphids on an individual leaf exceeded 200, counting was terminated and a count of 200 was recorded for that leaf. Yields were determined for only two treatments, the untreated check and the Bidrin treatment, by hand harvesting 10 row feet from each plot within these treatments.

Results and Discussion

At 2 DAT, all treatments except Phaser + Ovasyn significantly reduced aphid populations relative to the untreated check (Table 1). Although a count of 200+ is recorded for the check plots on this date, actual infestation

levels were estimated to be in excess of 600 aphids per leaf. All treatments containing Bidrin, Metasystox-R, Lannate, or Provado reduced aphid counts to less than 50 per leaf, which was greater than 90% control relative to infestation estimated for the untreated plots. By 5 DAT aphid populations had begun to resurge and only the two Bidrin treatments and the high rate of Lannate maintained populations at less than 100 aphids/leaf. Populations in the check plots were estimated to be in excess of 800 aphids/leaf at 5 DAT. The addition of Ovasyn did not significantly enhance the control provided by either Bidrin or Phaser.

At 21 DAT there were no significant differences between the check and selected treatments in either total number of nodes or square retention at the top 5 fruiting nodes (Table 2). However, measurements indicated that plants in the untreated plots were significantly shorter and had compressed terminal growth relative to the other selected treatments on which these measurements were made (Table 3). This severe stunting of untreated plants was very evident when observing the plots and persisted through harvest, as indicated in Table 4.

Comparison of yields from the Bidrin treatment and the untreated check show a 220-lb difference in lint yields that was apparently due to aphid control (Table 4). However, it must be noted that this aphid infestation was extremely severe and prolonged. Aphid counts had reached 632 aphids/leaf by the time treatments were applied. Heavy aphid populations persisted in the untreated plots for approximately three additional weeks and at one point exceeded 800/leaf before crashing due to fungal infection. It must also be noted that plants at this site did not appear to suffer undue stress from drought or other factors during the time the aphid infestation was present.

Table 1. Efficacy of selected treatments against cotton aphid, Leflore Co. MS, 1995.

Treatment	Avg. No. Aphids/Leaf ^{abc}				
	Lb ai/A	2 DAT	5 DAT	9 DAT	15DAT
Bidrin 8E	0.5	19de	58h	142de	162a
Bidrin 8E +	0.5 +				
Ovasyn 1.5E	0.188	13e	80gh	127e	180a
Metasystox-R 2E	0.33	45de	118def	166bcd	176a
Lannate 2.4LV	0.24	49cd	128cde	178bcd	182a
Lannate 2.4LV	0.45	31de	89fgh	152cde	178a
Phaser 3EC	0.75	129b	188a	185abc	174a
Thiodan 2CO	0.75	127b	185ab	187abc	182a
Phaser 3EC +	0.75 +				
Ovasyn 1.5E	0.188	141ab	152bc	180bcd	178a
Check	--	200+a	200+a	197a	194a
Lannate +	0.24 +				
Methyl P.	0.5	49cd	106efg	174bcd	192a
Provado 1.6F +	0.0473 +				
Kinetic HV	0.25%	41de	101efg	161bcde	188a
Thidan 2CO +	0.75 +				
Methyl P.	0.5	81c	148cd	196ab	171a

^a Within a column, means not followed by a common letter are significantly different (ANOVA, $P < 0.05$, LSD means separation).

^b Counts were made on 10 leaves per plot. When the number of aphids on an individual leaf exceeded 200, counting was terminated and 200 was recorded for that leaf.

^c Total number of aphids per leaf in the untreated check plot was approximately 600 and 800 at 2DAT and 5DAT respectively.

Table 2. Effect of selected aphid treatments on square retention and total number of nodes at 21 DAT, Leflore Co, 1995.

Treatment/ lb. Ai/A	% retention of P1 and P2 Squares at	
	Total Nodes ^a	Top 5 Nodes ^a
Bidrin 0.5	16.0a	98.8a
Bidrin 0.5 +		
Ovasyn 0.188	16.3a	99.3a
Lannate 0.24	16.5a	99.5a
Thiodan 0.75	16.3a	99.3a
Check	15.8a	99.5a

^a Within a column, means not followed by a common letter are significantly different (ANOVA, $P < 0.05$, LSD means separation).

Table 3. Effect of selected aphid treatments on total plant height and height of top 5 nodes at 21 DAT, Leflore Co, 1995.

Treatment/ Lb. Ai/A	Total Plant Height (in.) ^a	Height of Top 5 Nodes ^a
Bidrin 0.5	25.3ab	6.0ab
Bidrin 0.5 +		
Ovasyn 0.188	25.4a	6.3a
Lannate 0.24	23.5ab	5.6bcd
Thiodan 0.75	23.6ab	5.4cd
Check	19.2c	4.8e

^a Within a column, means not followed by a common letter are significantly different (ANOVA, $P < 0.05$, LSD means separation)

Table 4. Impact of prolonged, heavy aphid infestation on lint yield and height at harvest. Leflore Co, 1995.

Treatment	Lbs. Lint/A	Height at Harvest (in.)
Bidrin 0.5 lb. AI/A	1135	40.1
Check	915	35.3
difference	220 ^a	4.8 ^b

^a Significant at 0.01 level using t-test

^b Significant at 0.05 level using t-test

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