

EVALUATION OF INSECTICIDES FOR APHID CONTROL IN MISSISSIPPI 2001(TRIAL 2)

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ABSTRACT: The purpose of this trial was to evaluate insecticides for control of aphids on cotton. Tests were planted at the Plant Science Research Farm at Mississippi State University and included the following pesticides and rates: Bidrin 8 E, 0.4 Lb ai/ac; Dra-034 5 EC, 64, 128 and 256 Oz/100 Gal; Dra-034 5 EC, 128 Oz/100 Gal + Kinetic at 0.125% V/V; Leverage 2.7 SC, 0.063 Lb ai/ac; Calypso 4 F, 0.036 Lb ai/ac; Calypso 4 F, 0.036 Lb ai/ac + Kinetic at 0.125% V/V; Provado 1.6 F, 0.047 Lb ai/ac. The average number of aphids per 15 leaves before treatment with insecticide was 411 aphids. Because of rainfall, two applications of insecticide were necessary. Only Bidrin and Calypso plus Kinetic provided acceptable control following the second application of insecticide. Lady beetles were the only beneficial in the plots in sufficient numbers for evaluation of insecticide, and they were essentially unaffected by any of the insecticides applied in the trial.

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MATERIALS AND METHODS: The statistical design was randomized complete block with 4 replicates. Cotton, variety ST 4892 BR, was planted with triple treated seed at the Plant Science North Farm at Mississippi State University on 5/24/01 at a seed rate of 3 per ft. Plots were four rows wide and 50 (15.24 m) ft long arranged with four rows of cotton between plots and a planted buffer of 10 feet at the end of each plot. Insecticides were applied on 7/11/01 and on 7/18/01 with a high-clearance plot spray tractor with nozzles (Spray Systems, Tx4, hollow cone) spaced for a 38-in (96.5 cm) row spacing at 19-in (48.3 cm) centers with one nozzle directly over the row and one directly between rows. The carrier was water, and the volumetric application rate was 7.5 gallons (28.4L) per acre. Wind speed, temperature and relative humidity at time of first application was 0 to 1.1mph, 86⁰F and 66.0%, and second application was 0 to 2.0 mph, 81⁰F, and 61.3%, respectively. Plants in each plot were sampled on a four to five day interval early in the growing season for cotton aphids by selecting fifteen random plants in each plot. One leaf from four nodes below terminal were sample on each plant. The total number of aphids on the fifteen leaves was recorded. Sweep net samples of 25 sweeps per plot were also made to evaluate numbers of beneficial insects and tarnished plant bugs. Rain following the first insecticide application prevented control, necessitating the second application.

RESULTS AND DISCUSSION: The first application for this trial was made when the aphid population was well established. Because of the rain, results of the first application indicate that none of the treatments in the trial were statistically different from the untreated plots. Following the second application, aphid numbers were reduced in the untreated plots as compared to the previous sample date indicating that aphid populations were declining because of the entomopathogenic fungus. Following the second treatment, all compounds controlled aphids effectively except DRA-34 and Calypso without Kinetic. Because of the declining population and the presence of the fungal disease, further sampling was futile. The only beneficial insect with sufficient numbers to evaluate were lady beetles. These were unaffected by the insecticides as indicated by the lack of statistical difference in beetle numbers between treatments at the end of the trial.

Table 1. Mean of aphids per fifteen leaves, MSU Location.

Treatment	Rate	Jul-11-01	Jul-13-01	Jul-17-01	Jul-19-01
Water		468.8 a	172.8 a	152.5 a	55.5 bc
Bidrin 8 E	0.4 Lb ai/ac	370.3 a	200.8 aa	137.8 a	2.5 d
Dra-034 5 EC	128 OZ/100 Gal	401.5 a	162.8 a	144.0 a	59.3 bc
Dra-034 5 EC	64 OZ/100 Gal	295.5 a	236.5 a	159.8 a	87.5 ab
Dra-034 5 EC	256 OZ/100 Gal	435.5 a	347.3 a	195.3 a	104.3 a
Dra-034 5 EC + Kinetic	128 OZ/100 Gal 0.125% V/V	339.3 a	180.5 a	115.3 a	40.8 cd
Leverage 2.7 SC	0.063 Lb ai/ac	457.5 a	211.5 a	167.8 a	18.8 cd
Calypso 4 F	0.036 Lb ai/ac	462.3 a	143.0 a	146.0 a	21.0 cd
Calypso 4 F + Kinetic	0.036 Lb ai/ac 0.125% V/V	405.5 a	191.0 a	157.0 a	10.8 d
Provado 1.6 F	0.047 Lb ai/ac	475.0 a	136.5 a	126.3 a	19.8 cd
LSD (P=.05)		240.33	149.42	109.20	41.59
Treatment Prob(F)		0.8353	0.2443	0.9479	0.0002

Means within a column not sharing a common letter differ significantly (LSD; P=0.05).

Table 2. Mean insects per 25 sweeps and yield, MSU location, July 13, 2001.

Treatment	Rate	Tarnished plant bug adults	Tarnished plant bugs nymphs	Bigeyed bugs	Lady beetles
Water		1.3 a	0.0 a	2.5 a	7.3 a
Bidrin 8 E	0.4 Lb ai/ac	0.8 a	1.0 a	0.0 a	4.0 a
Dra-034 5 EC	128 OZ/100 Gal	1.3 a	0.3 a	0.5 a	9.3 a
Dra-034 5 EC	64 OZ/100 Gal	2.0 a	0.3 a	0.5 a	13.0 a
Dra-034 5 EC	256 OZ/100 Gal	1.3 a	0.5 a	0.3 a	11.8 a
Dra-034 5 EC + Kinetic	128 OZ/100 Gal 0.125% V/V	2.3 a	0.3 a	0.3 a	10.8 a
Leverage 2.7 SC	0.063 Lb ai/ac	1.0 a	0.0 a	0.3 a	11.5 a
Calypso 4 F	0.036 Lb ai/ac	0.8 a	0.0 a	0.8 a	8.8 a
Calypso 4 F + Kinetic	0.036 Lb ai/ac 0.125% V/V	1.3 a	0.3 a	0.3 a	4.3 a
Provado 1.6 F	0.047 Lb ai/ac	1.8 a	0.0 a	0.0 a	7.8 a
LSD (P=.05)		1.75	0.74	1.98	7.71
Treatment Prob(F)		0.7077	0.2059	0.3632	0.2647

Means within a column not sharing a common letter differ significantly (LSD; P=0.05).

Table 3. Mean insects per 25 sweeps, MSU location, July 17, 2001.

Treatment	Rate	Tarnished plant bug adults	Tarnished plant bug nymphs	Bigeyed bugs	Lady beetles
Water		0.3 a	0.0 a	0.0 a	6.0 a
Bidrin 8 E	0.4 Lb ai/ac	0.5 a	0.0 a	0.0 a	5.8 a
Dra-034 5 EC	128 Oz/100 Gal	0.0 a	0.0 a	0.0 a	4.0 a
Dra-034 5 EC	64 Oz/100 Gal	0.0 a	0.0 a	0.0 a	3.3 a
Dra-034 5 EC	256 Oz/100 Gal	0.0 a	0.0 a	0.0 a	8.5 a
Dra-034 5 EC + Kinetic	128 Oz/100 Gal 0.125% V/V	0.3 a	0.0 a	0.0 a	4.5 a
Leverage 2.7 SC	0.063 Lb ai/ac	0.3 a	0.0 a	0.0 a	5.7 a
Calypso 4 F	0.036 Lb ai/ac	0.3 a	0.0 a	0.0 a	4.3 a
Calypso 4 F + Kinetic	0.036 Lb ai/ac 0.125% V/V	0.5 a	0.0 a	0.0 a	4.8 a
Provado 1.6 F	0.047 Lb ai/ac	0.8 a	0.0 a	0.0 a	5.5 a
LSD (P=.05)		0.92	0.00	0.00	4.56
Treatment Prob(F)		0.7673	1.0000	1.0000	0.5745

Means within a column not sharing a common letter differ significantly (LSD; P=0.05).

Table 4. Mean insects per 25 sweeps, MSU location, July 19, 2001.

Treatment	Rate	Tarnished plant bug adults	Tarnished plant bug nymphs	Bigeyed bugs	Lady beetles
Water		0.3 a	0.0 a	0.0 a	3.5 a
Bidrin 8 E	0.4 Lb ai/ac	0.0 a	0.0 a	0.3 a	0.8 a
Dra-034 5 EC	128 Oz/100 Gal	0.5 a	0.0 a	0.3 a	1.0 a
Dra-034 5 EC	64 Oz/100 Gal	0.5 a	0.0 a	0.3 a	2.0 a
Dra-034 5 EC	256 Oz/100 Gal	0.3 a	0.3 a	0.5 a	3.0 a
Dra-034 5 EC + Kinetic	128 Oz/100 Gal 0.125% V/V	0.3 a	0.0 a	0.3 a	1.5 a
Leverage 2.7 SC	0.063 Lb ai/ac	0.0 a	0.0 a	0.0 a	1.5 a
Calypso 4 F	0.036 Lb ai/ac	0.3 a	0.0 a	0.8 a	2.0 a
Calypso 4 F + Kinetic	0.036 Lb ai/ac 0.125% V/V	0.5 a	0.0 a	1.3 a	1.8 a
Provado 1.6 F	0.047 Lb ai/ac	0.3 a	0.0 a	0.3 a	4.3 a
LSD (P=.05)		0.63	0.23	0.80	2.55
Treatment Prob(F)		0.6830	0.4635	0.0988	0.1595

Means within a column not sharing a common letter differ significantly (LSD; P=0.05).