

EFFECT OF SYSTEMIC INSECTICIDES ON APHIDS AND THRIPS IN COTTON

Texas Agricultural Experiment Station, Corpus Christi, TX, 1999

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OBJECTIVES: This field study was conducted to evaluate the effects of seed and in-furrow at-planting systemic insecticides on early season insects and to determine their impact on lint production.

MATERIALS/METHODS: DPL 20B variety cotton was planted at 56,000 seed/acre on 23 Mar in a sandy clay loam texture soil (52% sand, 16% silt, 32% clay, pH 8.1 and 1.1% organic matter) at the Texas Agricultural Experiment Station, Corpus Christi, TX, to evaluate effects of insecticides on aphids and thrips. The soil profile contained excellent moisture on the planting date and at the 4-inch depth was 74°F. Five days following planting 2.01 inches of rain was received. Fertilizer applied was 100-14-0+0.6 Zn and Treflan (1 qt/acre) was applied in late 1998 for weed control. Pix Plus (5.5 oz/acre) was applied for plant growth control on 14 May. Plots were 2 rows (38-inch centers) x 34 ft and 4 replications were arranged in a RCB design. Seed treatments were applied before planting and Temik was applied into the seed furrow through Gandy equipment.

Treatments effects were assessed by (1) counting the number of aphids and thrips found on 2 true leaf stage cotton (13 Apr) from 5 plants per plot (plants were placed in alcohol, washed and insects were collected on filter paper for microscopic examination), (2) assigning a visual plant damage rating (1 = no damage up to 5 = severe stunting and leaf curling) to plots on 1 May, and (3) harvesting 13.75 ft row by hand in each plot on 13 Aug. Seed cotton was processed on a 10-Saw Eagle Laboratory gin and samples were sent to the International Textile Center, Texas Tech University, Lubbock, TX for fiber analysis.

RESULTS/DISCUSSION: A significant reduction in thrips larvae, total numbers of thrips and plant damage was observed in cotton at the two true leaf stage in all insecticide treatments (Table 1). No differences were found in numbers of adult thrips. Numerically, all insecticide treated cotton had fewer cotton aphids. Aphids were statistically reduced in two of the Adage rate plots and in Gaucho treated cotton. No differences were found in plant population (Table 2). Except for Adage (5.1 oz/cwt seed), significantly more bolls were harvested from insecticide treated cotton and Adage (5.1 oz/cwt seed) treated cotton required fewer bolls to produce a pound of lint compared to all other treatments. Except for Adage (5.1 oz/cwt seed), significantly more cotton was harvested from insecticide treated cotton compared with the untreated check. Differences in micronaire, length, strength or elongation of cotton fiber were not detected (Table 3). A statistical difference in fiber uniformity occurred but we doubt the difference was due to treatment.

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Table 1. Thrips and aphids on 2 true leaf cotton where systemic insecticide was applied as a seed or in-furrow at-planting treatment, Texas Agricultural Experiment Station, Corpus Christi, TX, 1999.

Treatment/ rate	Thrips (number/5plants) ^a			Plant damage rating ^b	Aphids per 5 plants ^a
	Larvae	Adults	Total		
Adage 5FS (5.1 oz/cwt seed)	0.0 b	1.3 a	1.3 b	1.3 b	0.5 b
Adage 5FS (6.4 oz/cwt seed)	0.0 b	.8 a	.8 b	1.0 b	6.3 ab
Adage 5FS (7.6 oz/cwt seed)	0.0 b	.5 a	.5 b	1.0 b	0.3 b
Gaucho 480F (8.0 oz/cwt seed)	0.0 b	1.3 a	1.3 b	1.3 b	2.5 b
Temik 15G (4.0 oz/1000 ft row)	0.0 b	.8 a	.8 b	1.0 b	3.8 ab
Untreated	6.0 a	1.5 a	7.5 a	3.8 a	13.5 a
LSD (P=0.05)	̄	̄	2.01	.758	10.523
P>F	.0000	.1836	.0000	.0000	.0332

Means in a column followed by the same letter are not significantly different by ANOVA (P=0.05; LSD).

^a Cotton was at the 2 true leaf stage on 4/13.

^b Plant damage ratings range from 1 = no damage to 5 = severe stunting and leaf curling.

^c The P > F is based on transformed $\sqrt{x+1}$ data values; it is inappropriate to list LSD values based on transformed data.

Table 2. Plant population, cotton boll production and lint yield in cotton where systemic insecticide was applied as a seed or in-furrow at-planting treatment, Texas Agricultural Experiment Station, Corpus Christi, TX, 1999.

Treatment/rate	Plants (1000's/acre)	Numbers (1000's/acre)		Yield (lb lint/acre)
		Harvested bolls	Bolls/lint lb	
Adage 5FS (5.1 oz/cwt seed)	46.5 a	290 b	259 b	1120 bc
Adage 5FS (6.4 oz/cwt seed)	57.7 a	330 a	278 a	1188 ab
Adage 5FS (7.6 oz/cwt seed)	58.2 a	331 a	276 a	1200 a
Gaucho 480F (8.0 oz/cwt seed)	58.2 a	334 a	277 a	1203 a
Temik 15G (4.0 oz/1000 ft row)	53.0 a	328 a	276 a	1186 ab
Untreated	49.2 a	293 b	276 a	1060 c
LSD (P=0.05)	NS	30.79	16.63	76.2
P>F	.0518	.0036	.0466	.0014

Means in a column followed by the same letter are not significantly different by ANOVA (P=0.05; LSD).

Table 3. Effects of systemic insecticide applied as a seed or in-furrow at-planting treatment on cotton fiber characteristics, Texas Agricultural Experiment Station, Corpus Christi, TX, 1999.

Treatment/formulation	Fiber characteristics ^a				
	Mic	Lgth	Ur	St	Elong
Adage 5FS (5.1 oz/cwt seed)	5.2 a	1.08 a	84.0 a	26.5 a	6.5 a
Adage 5FS (6.4 oz/cwt seed)	5.0 a	1.08 a	83.2 abc	26.8 a	6.5 a
Adage 5FS (7.6 oz/cwt seed)	4.9 a	1.09 a	83.7 ab	26.4 a	6.5 a
Gaucho 480F (8.0 oz/cwt seed)	5.0 a	1.06 a	83.6 ab	26.2 a	6.5 a
Temik 15G (4.0 oz/1000 ft row)	5.1a	1.09 a	82.4 c	26.5 a	6.4 a
Untreated	5.2 a	1.08 a	82.8 bc	26.4 a	6.7 a
LSD (P=0.05)	NS	NS	1.171	NS	NS
P>F	.1183	.1033	.0179	.5437	.1777

Means in a column followed by the same letter are not significantly different by ANOVA (P=0.05; LSD).
^a Mic = micronaire, Lgth = length, Ur = uniformity ratio, St = strength, Elong = % elongation