Evaluation of Insecticides for Control of Kurtomathrips Morrilli in Cotton, 2011

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Summary:

Kurtomathrips morrilli is an unusual thrips that occasionally attacks and severely damages cotton in the southwestern United States, but there is very little information available regarding this pest. In 2011, the south plains region of Texas was severely impacted by a drought which may have been a key factor resulting in an outbreak of *K. morrilli*. This outbreak encompassed an estimated 330,000 acres of cotton, approximately 83,000 acres of which received insecticide applications. The outbreak resulted in the loss of about 24 million pounds of cotton lint, resulting in over $20 million in yield loss and control costs. Water-deficit stressed cotton appeared to be most severely affected by *K. morrilli*, while cool temperatures and precipitation appeared to naturally mediate the outbreak. Insecticide efficacy tests determined that the neonicotinoid insecticides, Intruder (acetamiprid), Trimax Pro (imidacloprid) and Centric (thiamethoxam), and the organophosphate Orthene (acephate) were highly effective in mediating *K. morrilli* infestations. The mostly commonly used insecticides in the 2011 outbreak were imidacloprid, primarily generic brands, and acephate. These were the insecticides of choice primarily because they were inexpensive, yet effective.

Objective:

The objective of this study was to evaluate the efficacy of insecticides towards Kurtmathrips Morrilli in cotton.

Materials and Methods:

Three tests were conducted in a commercial cotton fields grown near Seminole, TX. The fields were on 36 or 40-inch rows, and were irrigated using a pivot irrigation system. All three tests were planted with the same variety, Phytogen 367WRF. All the tests were RCB designs with four replications. Plots were 4-rows wide × 50 ft in length. Insecticides were applied with a CO_2 pressurized hand-boom sprayer calibrated to deliver 10 gpa through TX-6 hollow cone nozzles (2 per row) at 40 psi. Insecticides were applied to all four rows of each plot.

Treatments were evaluated by collecting 5 or 10 leaves into 1-pt jars containing a 30% isopropyl alcohol solution. The jars were returned to the laboratory where the thrips were vacuum filtered onto filter paper and then counted using a stereo dissecting scope. On two tests, the middle two rows of each plot were harvested using a mechanized cotton stripper with integrated scales. Grab samples were ginned for turn out and quality. Data were analyzed using ANOVA and means were separated using an F-protected LSD ($P \leq 0.05$).

Results and Discussion:

At test site 1, the thrips population was very high averaging 136 thrips per leaf prior to spraying on 25 Jul (Table 1). At 3 days after treatment (DAT), the thrips numbers were highly variable among treatments and there were no significant differences. However, for immature and total thrips at 7 DAT, Intruder had the fewest thrips, but did not differ from Orthene or Trimax Pro. Neither Radiant nor Tracer differed from the untreated. By 9 Aug the thrips population had declined across the entire test and all the insecticide treatments had fewer thrips than the untreated.

At test site 2, the thrips population was averaging about 23 thrips per leaf when the test was initiated on 17 Aug (Table 2). At 7, 12, and 21 DAT, all of the products and rates evaluated had fewer thrips than the untreated, but there were no differences among the insecticides. Significant differences in yield were detected in this test. Centric at 1.8 oz had the highest yield but was not statistically better than either rate of Intruder, the low rate of Centric or the high rates of Orthene or Trimax Pro. Both rates of Centric and Intruder were the only insecticide treatments that yielded significantly more than the untreated.

At test site 3, the thrips population was averaging 16.75 thrips per leaf on 26 Aug prior to the insecticide applications, and there were no statistical differences among treatments at this time (Table 3). At 7 DAT, Vydate at 17 fl-oz had fewer immature and total thrips than the untreated but did not differ from Vydate at 8.5 fl-oz. By 14 DAT, the thrips population had increased in the untreated and both rates of Vydate had fewer immature and total thrips than the untreated. Vydate does have some activity on these thrips, but the level of activity does not appear to be as good as what was observed from some of

the other insecticides in the other tests. No differences in yield were detected among treatments in test 3.

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Disclaimer Clause:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M University System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Test 1.

Treatment/ formulation	Rate amt product/acre	Thrips per 5 leaves											
		25 Jul (pre-treatment)			28 Jul (3 DAT)			1 Aug (7 DAT)			9 Aug (15 DAT)		
		immatures	adults	total	immatures	adults	total	immatures	adults	total	immatures	adults	total
Untreated	--	377.75a	167.50a	545.25a	293.75a	51.25a	345.00a	334.00a	61.25a	395.25a	139.00a	56.00a	195.00a
Trimax Pro	1.8 fl-oz	665.00a	110.50a	775.50a	90.00a	5.25a	95.25a	55.50cd	5.75a	61.25bc	21.25b	22.00b	43.25b
Orthene 97	8 oz	424.50a	61.00a	485.50a	145.25a	13.00a	158.25a	45.50cd	9.00a	54.50c	10.75b	13.75b	24.50b
Intruder 70WP	1.0 oz	716.00a	136.50a	852.50a	77.75a	10.50a	88.25a	23.00d	1.75a	24.75c	0.50b	1.75b	2.25b
Radiant 1SC	6.0 fl-oz	545.00a	113.75a	658.75a	154.75a	14.50a	169.25a	177.50bc	14.50a	192.00bc	2.25b	4.00b	6.25b
Tracer 4SC	2.5 fl-oz	509.25a	242.25a	751.50a	227.25a	17.75a	245.00a	230.00ab	18.75a	248.75ab	15.50b	18.50b	34.00b

Values in a column followed by the same letter are not significantly different based on an F-protected LSD ($P \leq 0.05$).

Test 2.

Treatment/ formulation	Rate amt product/acre	Thrips per 10 leaves 17 Aug (pre-treatment) imm	adults	total	24 Aug (7 DAT) imm	adults	total	30 Aug (12 DAT) imm	adults	total	8 Sep (21 DAT) imm	adults	total	7 Nov Yield lint-lbs/ac
Untreated	--	172.00a	51.25a	223.25a	217.00a	57.75a	274.75a	227.00a	52.25a	279.00a	53.00a	30.00a	83.00a	431.35d
Trimax Pro	1.2 fl-oz	154.88a	225.71a	380.60a	42.25b	10.00b	52.25b	13.00b	15.75b	29.00b	2.00b	2.25b	4.25b	454.27cd
Trimax Pro	1.8 fl-oz	158.25a	29.75a	188.00a	22.75b	6.75b	29.50b	1.00b	3.00b	4.00b	0.50b	2.50b	3.00b	675.92a-d
Orthene 97	4 oz	54.25a	38.25a	92.50a	13.50b	6.50b	20.00b	0.75b	3.50b	4.00b	1.00b	0.50b	1.50b	570.42bcd
Orthene 97	8 oz	168.88a	51.05a	219.93a	13.00b	13.00b	26.00b	4.75b	15.50b	20.00b	1.00b	2.25b	3.25b	727.05ab
Intruder 70WP	0.6 oz	204.50a	57.25a	261.75a	13.00b	12.50b	25.50b	0.00b	0.50b	1.00b	0.75b	0.75b	1.50b	712.88ab
Intruder 70WP	1.0 oz	154.50a	41.75a	196.25a	15.75b	14.75b	30.50b	0.75b	7.00b	8.00b	1.25b	0.25b	1.50b	766.93ab
Centric 40WG	1.8 oz	171.00a	41.75a	212.75a	30.50b	24.00b	54.50b	0.75b	6.50b	7.00b	1.00b	3.25b	4.25b	859.01a
Centric 40WG	2.5 oz	175.00a	66.00a	241.00a	12.50b	10.00b	22.50b	0.75b	4.25b	5.00b	1.00b	0.25b	1.25b	687.62abc

Values in a column followed by the same letter are not significantly different based on an F-protected LSD ($P \leq 0.05$).

Test 3.

Treatment/ formulation	Rate amt product/acre	Thrips per 10 leaves 26 Aug (pre-treatment) imm	adults	total	1 Sep (7 DAT) imm	adults	total	8 Sep (14 DAT) imm	adults	total	10 Oct Yield lint-lbs/ac
Untreated	--	290.50a	381.25a	381.25a	295.00a	102.00a	397.00a	409.00a	173.50a	582.50a	639.25a
Vydate C-LV	8.5 fl-oz	214.50a	293.50a	293.50a	159.25ab	27.25a	186.50ab	141.50b	23.75a	165.25b	713.76a
Vydate C-LV	17 fl-oz	194.25a	314.25a	314.25a	48.25a	11.25a	59.50b	63.75b	20.50a	84.25b	688.09a

Values in a column followed by the same letter are not significantly different based on an F-protected LSD ($P \leq 0.05$).