



## Applied Research Report

### EVALUATION OF SEVERAL EARLY SEASON THRIPS MANAGEMENT APPROACHES FOR TEXAS HIGH PLAINS COTTON

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#### **Problem:**

Thrips are a recurring problem to seedling cotton in the Texas High Plains. Yield losses where thrips were not controlled average 21% across infested irrigated acreage. This represents approximately 1.75 million acres. In spite of considerable research over the last 20 years clearly demonstrating the economic benefits of thrips control, many producers continue to ignore thrips as a serious pest (Leser 1986). High front-end cost is a big factor for producers not willing to adopt preventative thrips control practices on over half of the affected acres. Inconvenience in using granular systemic insecticides is another reason for lower adoption rates. Toxicity of these insecticides even with the added safety provided by “lock-and load” application systems is still a concern. Producers would really rather use a seed treatment if at all possible. Finally, there are still producers that do not believe that thrips are as damaging as reported.

Until recently, available seed treatments have not been competitive with the standard systemic insecticide, Temik. Orthene, either as a seed treatment from the delinters or a planter-box treatment, has provided erratic results and usually does not provide adequate residual; control (2 weeks from planting). The newer Gaucho seed treatment, while effective in some cotton growing regions of the U. S., has never performed well in the Texas High Plains. It is not effective against the dominant species in this area, the western flower thrips.

#### **Objective:**

To evaluate thrips management strategies in irrigated cotton. This includes comparing seed treatments with Temik and foliar treatments. It also includes evaluating the need for follow-up foliar applications on at-planting preventative treatments.

## Materials and Methods:

The test was planted on May 14, 2003 using the cotton cultivar, PM 2326RR. All treatments had Maxim, Systhane and Apron fungicides applied (Dynasty). A sprinkler-irrigated commercial field near Lariat, Texas was utilized. A randomized complete block design with 4 replications was utilized with treatments applied to plots measuring 150 feet by two rows. Treatments included:

- 1) Untreated Check
- 2) Foliar Orthene based on the ET
- 3) Temik 15G, 3.5 lbs / acres
- 4) Temik 15G, 3.0 lbs / acres
- 5) Temik 15G, 5.0 lbs / acres
- 6) Temik 15G, 5.0 lbs / acres + foliar Orthene based on the ET
- 7) Cruiser 5FS ST 30
- 8) Cruiser 5FS ST 34
- 9) Cruiser 5FS ST 300
- 10) Temik 15G, 3.5 lbs / acres + foliar Orthene based on the ET
- 11) Gaucho 600 ST
- 12) Cruiser 5FS ST 34 + foliar Orthene based on the ET

Foliar treatments consisted of Orthene 90S applied at the 2.0 ounces/acre broadcast rate adjusted for a 10-inch application band. The economic threshold (ET) currently used for the Texas High Plains is one thrips per true leaf present (adult or immature) with applications usually ceasing after the 5<sup>th</sup> true leaf. Treatments that had previously been treated with a seed treatment, a soil applied or foliar insecticide had to have 30% or more immature thrips in addition to exceeding the established total thrips threshold to trigger a subsequent treatment.

Thrips were counted on ten plants in each plot on 5/28 (14 days after planting-DAP), 6/9 (26 DAP), and 6/13 (30 DAP). Adults were separated from immatures and species determinations made. Mean separation was determined using ANOVA and LSD.

## Results and Discussion

Thrips infestations were moderate as the cotton emerged (Table 1). The population was erratic due to environmental conditions including frequent thunderstorms and cool conditions. The dominant thrips species was the western flower thrips, *Franklinella occidentalis* (Pergande). This species is typically associated with wheat and moves into cotton once the wheat matures. The test field was in an area with abundant wheat fields. Fourteen days after planting cotton in test plots were in the cotyledon stage and the economic threshold was one thrips per plant. Based on total thrips numbers, the foliar Orthene ET treatment required one insecticide application on 5/28. With the exception of the Gaucho seed treatment, all preventative treatments had significantly lower thrips numbers than the untreated check or the previously untreated foliar Orthene treatment plots. Weather events prevented the regular scheduled evaluation 21 DAP. At 26 DAP the foliar Orthene, Cruiser ST 300 and all Temik treatments had significantly lower numbers of total thrips per plant than all other treatments (Table 2). The Gaucho seed treatment continued to have higher total thrips per plant than all treatments including the untreated check.

Due to the inclement weather percent immature thrips was extremely variable between replications. Immature thrips ranged from 3.3% to 16.3% but none were significantly different. At this time cotton plants had two true leaves and the ET was increased to 2 thrips/plant. Although some treatments approaches or exceeded this threshold, none of these met the 30% immatures criteria. Thrips pressure declined in all treatment by 30 DAP (Table 3). Cotton plants had 3-4 true leave present at this time. While total thrips numbers declined below threshold levels, the percent immature thrips went up due to the absence of adults. The trial was lost due to hail prior to the fourth evaluation.

### **Conclusions**

The Cruiser seed treatments and the soil applied insecticide, Temik, performed well early. The Cruiser seed treatments were no longer effective at 26 DAP with the exception of the Cruiser ST 300 treatment. Poor growing conditions and hard rainfall may have played a part in the erratic performance of the treatments. Temik continues to be a top performing thrips management tool. Foliar Orthene applied at the recommended economic threshold can perform as well as the preventative treatments but requires a high degree of management. The Cruiser seed treatment continues to show promise as an effective thrips management tool in a convenient delivery method but does not appear to have the residual activity of Temik, at 3.0 or more lbs/acre rates. The Gaucho seed treatment was again not effective due to the presence of western flower thrips. Subsequent treatment thresholds should include not only thrips numbers but also percent immatures as criteria. This trial was lost to hail before we were able to gather COTMAN and yield data.

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### **References**

Leser, J. F. 1986. Thrips management: problems and progress. Proc. Beltwide Cotton Conf. Nat. Cotton Council. pp. 175-178.

**Table 1. Thrips numbers per plant, 5-28-03 (14 DAP).**

<b>Treatment</b>	<b>Thrips per Plant</b>
Untreated Check	14.05 ab
Foliar Orthene ET	12.32 b
Temik 15G @ 3.5 lbs / acre	0.95 c
Temik 15G @ 3.0 lbs / acre	0.43 c
Temik 15G @ 5.0 lbs / acre	0.43 c
Temik 15G @ 5.0 lbs / acre + foliar ET	0.43 c
Cruiser 5FS ST 30	1.23 c
Cruiser 5FS ST 34	0.88 c
Cruiser 5FS ST 300	1.23 c
Temik 15G @ 3.5 lbs / acre + foliar ET	0.30 c
Gaucho 600 ST	14.80 a
Cruiser 5FS ST 34 + foliar ET	2.05 c
LSD (P=.10)	2.025
Standard Deviation	1.688
CV	41.26

Means followed by the same letter do not significantly differ (P=.10, LSD)

**Table 2. Thrips numbers per plant and percent immatures, 6-9-03 (26 DAP).**

<b>Treatment</b>	<b>Thrips per Plant</b>	<b>% Immature Thrips</b>
Untreated Check	6.03 bc	14.97 a
Foliar Orthene ET	2.45 f	6.1 a
Temik 15G @ 3.5 lbs / acre	3.08 ef	6.9 a
Temik 15G @ 3.0 lbs / acre	2.97 ef	13.0 a
Temik 15G @ 5.0 lbs / acre	1.83 f	10.1 a
Temik 15G @ 5.0 lbs / acre + foliar ET	1.95 f	7.4 a
Cruiser 5FS ST 30	6.35 b	10.7 a
Cruiser 5FS ST 34	5.48 bcd	16.3 a
Cruiser 5FS ST 300	4.28 de	15.4 a
Temik 15G @ 3.5 lbs / acre + foliar ET	2.50 f	3.3 a
Gaucho 600 ST	8.98 a	13.12 a
Cruiser 5FS ST 34 + foliar ET	4.90 cd	13.7 a
LSD (P=.10)	1.441	8.52
Standard Deviation	1.200	7.10
CV	28.37	65.15

Means followed by the same letter do not significantly differ (P=.10, LSD)

**Table 3. Thrips numbers per plant and percent immatures, 6-13-03 (30 DAP).**

<b>Treatment</b>	<b>Thrips per Plant</b>	<b>% Immature Thrips</b>
Untreated Check	1.58 bc	50.6 ab
Foliar Orthene ET	1.40 c	29.3 de
Temik 15G @ 3.5 lbs / acre	2.75 a	29.5 cde
Temik 15G @ 3.0 lbs / acre	1.85 bc	26.4 de
Temik 15G @ 5.0 lbs / acre	1.63 bc	23.5 de
Temik 15G @ 5.0 lbs / acre + foliar ET	1.13 c	20.0 e
Cruiser 5FS ST 30	1.83 bc	44.4 abc
Cruiser 5FS ST 34	1.73 bc	51.2 ab
Cruiser 5FS ST 300	2.28 ab	52.3 ab
Temik 15G @ 3.5 lbs / acre + foliar ET	1.35 c	21.3 e
Gaucho 600 ST	1.18 c	58.5 a
Cruiser 5FS ST 34 + foliar ET	2.28 ab	37.6 bcd
LSD (P=.10)	0.794	15.088
Standard Deviation	0.662	12.574
CV	37.9	33.95

Means followed by the same letter do not significantly differ (P=.10, LSD)