

THRIPS CONTROL IN THE MISSISSIPPI DELTA, 1993-97

R. E. Furr Jr., F. A. Harris and J. T. Robbins
Delta Research and Extension Center
Mississippi State University, MAFES
Stoneville, MS

Abstract

Two methods were tested for thrips control in the Mississippi Delta from 1993-97: At planting applications (in-furrow granules, in-furrow sprays, and seed treatments) and foliar sprays. Most of the at-planting thrips control treatments recommended in the *Mississippi Cotton Insect Control Guide* have been tested in two or more field experiments during the five year period. In-furrow granule (IFG) products were Temik 15G®, Disyston 15G®, Thimet 20G®, and Payload 15G®. In-furrow spray (IFS) products were Disyston 8E® and Orthene 90S®. The seed treatment (ST) product tested was Gaucho 480®. All products tested significantly reduced thrips infestation and in some cases increased yield. Temik (0.5 and 0.75 lb ai/A) was the most consistent product tested based on thrips infestation reduction and yield increase. Gaucho seed treatment has proved to be comparable to in-furrow granules and sprays in most cases based on thrips control and yield protection. Potential thrips control foliar spray treatments were compared to products currently recommended in the *Mississippi Cotton Insect Control Guide*. Products tested in one or more field trials during the five-year period, which provided equally effective or more effective thrips control than currently recommended products were Pirate®, Karate®, Decis®, and Regent® (fipronil). Baythroid® provided good thrips control in a test in 1995 but was less effective in two trials in 1997. Provado® provided significant thrips control but there was some evidence that it was slower acting than some other products. Disyston 8E foliar spray treatment appeared to have been tested at a rate (0.2 lb ai/A) too low for effective thrips control.

Materials and Methods

The list of treatments, including product, application rate, and method of application are shown in tables of data referenced in the discussion of results for each trial.

At-Planting Insecticides

1993. Treatments were applied to 4 row plots (13.3 ft. wide x 50 ft. long) and were arranged in randomized complete blocks replicated 6 times. Planting pattern was 4 x 4 skip row so that each plot was bordered on each side by a 4 row fallow strip. Plots were planted and granule insecticide treatments (IFG at planting), and in-furrow spray treatments (IFS - at planting) were applied with a 4 row John Deere®

model 7100 planter adapted for Almaco® cone type planters and Kincaid® cone granule applicators. In-furrow spray treatments were applied with a planter mounted compressed air sprayer system operated at 69 psi which delivered 4.7 gpa spray volume through Conejet® TX-5 spray tips directed around the seed as they dropped into the seed furrow and before the seed were covered with soil. Operating speed for the planter and in-furrow treatment applications was 2.2 mph.

Planting date and in-furrow treatment application date was 21 May 1993. Cotton variety was DES-119 (Orthene treated seed). Use of treated seed was an error and caused reduced thrips counts in the plots.

Plots were harvested on 11 Oct with an International Harvester® model 622 cotton picker. Two center rows in each plot were picked and seed cotton per 100 row ft weighed. Data were converted and are presented as mean pounds of lint per acre, based on 35% gin turnout.

1994. Methods and materials in 1994 were similar to that described for 1993, except for the following difference. Plots were 2 rows wide (6.65 ft) by 50 ft long replicated 4 times. Each 2-row plot was bordered on one side by the adjacent plot and on the other side by a 4-row fallow strip in the 4x4 skip row planting pattern. In-furrow sprays were applied with the planter and planter mounted sprayer operated at 1.9 mph and 41 psi which delivered 4.36 gpa spray volume through Conejet TX-4 spray tips. Planting date of DES 119 cotton variety was 12 May. Plots were harvested on 5 Oct.

1995. Methods and materials in 1995 were the same as 1993 for in-furrow granules, and the same as 1994 for in-furrow sprays, except for the planting date of 19 May 1995 and the harvest date of 19 Sept. Gaucho seed treatment was applied by Gustafson. The same seed lot was used for all treatments. Variety was DPL 50. Treatments were replicated 4 times in a RCB design.

1996. In-furrow granule application method was the same in 1996 as in 1993. In-furrow spray application method was the same in 1996 as in 1994. Gaucho seed treatment was applied by Gustafson, Inc. who used the same seed lot as was planted in all other plots. Planting date was 10 May. Cotton variety was DPL-50. Plots were harvested on 9 Oct with a John Deere model 990 cotton picker. Treatments were replicated 4 times in a RCB design.

1997. In-furrow granule application was the same in 1997 as in 1993. In-furrow spray treatments were applied with a planter mounted compressed air sprayer system operated at 36 psi, which delivered 5 gpa spray volume through TeeJet® 80015E spray tips directed around seed as they dropped into the seed furrow and before seed were covered with soil. Planting speed was 3.5 mph. Gaucho seed treatment was applied by Gustafson, Inc. The same seed lot

of cotton variety DPL-50 was used for all treatments. Planting date was 7 May. Plots were harvested 7 Oct with a John Deere model 990 cotton picker. Treatments were replicated 4 times in a RCB design.

Foliar-Spray Insecticides

1993. Treatments were applied to 4 rows plots (13.3 ft wide x 50 ft long) and were arranged in randomized complete blocks replicated 6 times. Planting pattern was 4 x 4 skip row so that each plot was bordered on each side by a 4 row fallow strip. Planting date was 21 May 1993. Cotton variety was DES-119. Treatment applications were made with a Melroe Spracoup® model 230 at 5.5 mph. Sprayer nozzles were ConeJet® TX-8 arranged flat on the boom at 20 inch spacings between nozzles. Sprayer was operated by compressed air, which delivered 6.4 gpa water diluted spray mixtures with 42 psi line pressure. Application was later than normal for foliar spray thrips control treatment because early infestation in the plots was light.

1996. Treatments were arranged in 4 replicate randomized complete blocks. Cotton variety was DPL 50 planted on 6 May. Plot size was 4 rows wide (13.3 ft) by 50 ft long. Cotton variety was DPL-50 planted on 6 May. Experimental design was randomized complete block replicated 4 times.

Treatment applications were made with a Melroe Spracoupe, model 230 at 5.5 mph. Sprayer nozzles were ConeJet TX-8 arranged flat on the boom at 20 inch spacings between nozzles. Spray mixtures were water diluted and sprayed at an operating line pressure of 46 psi, which delivered a spray volume of 6.0 gallons per acre. Spray system was operated with compressed air with which spray tanks were pressurized to deliver spray mix to the boom.

Plots were harvested on 9 Oct with a John Deere model 990 cotton picker. Two rows in each plot were harvested and data were converted to lint cotton yield using 35 percent turnout.

1997. Two field trials were conducted on Delta Branch Experiment Station in 1997 to evaluate foliar spray insecticides for thrips control. Experimental design and method of application were the same as in 1996. Cotton variety was DPL-50 planted on 7 May. Plots were harvested 29 Sept with a John Deere model 990 cotton picker.

Observations and Data Analysis

All thrips counts were composites of all thrips species and life stages per 10 plants per plot. Plants were pulled in the field, taken to a laboratory, and threshed over a screen so thrips could be counted on white paper in the bottom of an 8.5" x 11" box. Data were analyzed by Analysis of Variance and mean differences were tested for significance by the Least Significant Difference (P=.05) procedure.

Results

At-Planting Insecticides

1993. Thrips infestation counts are summarized in Table 1 for 4 postemergence observation dates. Thrips control by insecticide treatments showed statistical significance for all treatments on the first observation date, 1 Jun, approximately 10 days after crop emergence, except Disyston 8E (0.75 lb ai/acre). Thrips counts on 10 Jun approximately 20 days postemergence showed no statistically significant differences. Thrips counts on 17 Jun, approximately 27 days postemergence, and on 24 Jun, approximately 34 days postemergence showed Temik 15G (0.5 lb ai/acre) and Temik 15G (0.75 lb ai/acre) maintained statistically significant thrips reduction.

Mean lint cotton per acre yield estimates are summarized in Table 2. No insecticide treatments resulted in yield significantly different from the Orthene seed treatment check.

1994. Thrips infestation counts are summarized in Table 3 for 4 postemergence observation dates. Thrips control by insecticide treatments showed statistical difference for all treatments on the first observation date, 24 May, approximately 6 days after crop emergence. Thrips counts on 30 May approximately 12 days postemergence showed a statistically significant difference for Thimet 20G (0.75 lb ai/Acre). Thrips counts on 6 Jun, approximately 19 days postemergence showed no statistically significant differences. On 13 Jun, approximately 26 days postemergence, Payload 15G (0.5 lb ai/acre), Orthene 90S (0.9 lb ai/acre), Temik 15G (0.75 lb ai/acre), and Thimet 20G (0.75 and 1.0 lb ai/acre) maintained statistically significant thrips reduction.

Mean lint cotton per acre yield estimates are summarized in Table 4. No insecticide treatments resulted in yield significantly different from the untreated check.

1995. Thrips infestation counts are shown in Table 5 for three postemergence observation dates. Thrips control by insecticide treatments showed statistically significant differences for all treatments over the untreated check on 25 May and 5 Jun. Gaucho seed treatment provided thrips control comparable to IFG application of Temik and Payload.

Mean lint cotton per acre yield estimates are presented in Table 6. None of the treatments showed statistical significance from the untreated check. However, Temik (0.75 lb ai/A) showed significantly higher yield than Payload (1.0 lb ai/A).

1996. Table 7 summarizes data on thrips counts per 10 plants per plot on four observation dates. On 21 May all treatments were significantly different from the untreated check except Garlic + Fish Oil (3.2 + 3.2 oz pr/A) and

Payload (0.75 lb ai/A). On 24 May only Garlic + Fish Oil (3.2 + 3.2 oz pr/A) was not significantly better than the untreated check. On 28 May five treatments were significantly lower than the untreated check; Temik (0.5 lb ai/A), Thimet (0.5 lb ai/A), Payload (0.75 lb ai/A), Payload (1.0 lb ai/A), and Orthene IFS (0.9 lb ai/A). However, on 31 May or twenty one days after treatment application only Temik (0.5 lb ai/A) and Payload (1.0 lb ai/A) were significantly lower than the untreated check.

Lint yield per acre estimates using 35 percent turnout are summarized in Table 8. Yield differences were not statistically significant (LSD, $p=0.05$).

1997. Thrips counts are summarized in Table 9. All treatments showed significant reduction in mean thrips infestation on two or more of the seven observation dates. Only Thimet (1.0 lb ai/A) and Temik (0.5 lb ai/A) resulted in statistically significant reduction in Thrips infestation on June 6, the date of heaviest infestation.

Lint yield per acre estimates are summarized in Table 10. There were no statistically significant yield differences.

Foliar-Spray Insecticides

1993. Thrips infestation counts are summarized in Table 11. All treatments showed significantly fewer thrips than the untreated check, which also showed fewer thrips than were observed pretreatment. Pirate treatments were about equivalent to Bidrin (0.2 lb ai/acre) for thrips control, and all Pirate rates had slightly lower numerical means than Bidrin.

1996. Table 12 summarizes mean thrips per 10 plants per plot. Counts made on 14 May were pretreatment.

Counts on 21 May showed thrips significantly lower than the untreated check in the following treatments: Baythroid 2E (0.015 lb ai/A), Baythroid 2E + Provado 1.6E (0.025 + 0.02 lb ai/A), Monitor 4E (0.1 lb ai/A), Karate 1E (0.015 lb ai/A), and Fipronil 2.5EC (0.025 lb ai/A).

Counts on 24 and 28 May showed no significant treatment differences even though average thrips counts were lowest on 24 May in plots treated with Monitor 4E (0.1 lb ai/A) and Fipronil 2.5EC (0.025 lb ai/A). A 1" rain on 28 May may have affected the low and variable counts on that date.

Counts on 31 May showed a much higher level of thrips infestation than the previous observation date and the following treatments showed average thrips counts significantly lower than the untreated check: Baythroid 2E + Provado 1.6E (0.025 + 0.02 lb ai/A), Karate 1E (0.015 lb ai/A), and Fipronil 2.5EC (0.025 lb ai/A).

Mean lint cotton per acre yield estimates are presented in Table 13. All treatments produced average lint yield higher than the untreated check and the following seven treatments

had average yields significantly higher than the untreated check: Provado 1.6E + OS surfactant (0.025 lb ai/A + 0.125 % v/v), Baythroid 2E (0.015 lb ai/A), Baythroid 2E + Provado 1.6E (0.015 + 0.025 lb ai/A), Monitor 4E (0.1 lb ai/A), Karate 1E (0.015 lb ai/A), Vydate CLV 3.77E + Lannate LV 2.4E (0.25 + 0.225 lb ai/A), and Fipronil 2.5E (0.025 lb ai/A). Yield effects may have been partly affected by control of other unrecorded pest infestations by the foliar sprays.

1997 (Test I). Mean thrips infestation data are shown in Table 14. All treatments significantly reduced thrips infestation on the first posttreatment observation dates, except Disyston (0.2 lb ai/A) after the second application. All three rates of Orthene 90 S (0.2, 0.5, and 1.0 lb ai/A) provided the most consistent thrips control among the treatments. The rate of Disyston 8E, 0.2 lb ai/A, appeared to be too low for consistent thrips control.

Mean lint/acre yield data are shown in Table 15. There were no significant treatment effects on yield.

1997 (Test II). Mean thrips infestation data are shown in Table 16. All treatments in the test, including the 6 pyrethroids, significantly reduced thrips infestation on the first observation date following each application.

Mean lint/acre yield data are shown in Table 17. No significant treatment effect on yield was observed.

Conclusions

All products currently recommended in the *Mississippi Cotton Insect Control Guide* for at-planting application (in-furrow granules, in-furrow sprays, and seed treatment), except Orthene seed treatment, have been tested in two or more field experiments between 1993 and 1997. All products tested significantly reduced thrips infestation and in some cases increased yield. Temik (0.5 and 0.75 lb ai/A) was the most consistent product tested based on thrips infestation reduction and yield increase. Gaucho seed treatment has been comparable to in-furrow granules and in-furrow sprays in most cases based on thrips control and yield data.

Several foliar spray insecticides that are not included in the *Mississippi Cotton Insect Control Guide* have been tested in field trials. Products tested in one or more field trials during the five-year period, which provided equally or more effective thrips control than currently recommended products were Pirate, Karate, Decis, and Regent (fipronil). Baythroid provided good thrips control in a test in 1995 but was less effective in two tests in 1997. Provado provided significant thrips control but there was some evidence that it was slower acting than some other products.

References

Cotton insect control guide. 1997. Mississippi State University, Mississippi Cooperative Extension Service, Pub. 343.

Table 1. Mean thrips per 10 plants on 4 observations dates, Stoneville, MS. 1993.

| Treatment | Rate (lb ai/acre) | Observation Dates | | | |
|-------------------|----------------------|-------------------|------------|------------|------------|
| | | 6/1 | 6/10 | 6/17 | 6/24 |
| Temik 15G IFG | 0.5 | 0.2 | 1.2 | 9.0 | 6.6 |
| Temik 15G IFG | 0.75 | 0.2 | 0.2 | 5.2 | 7.3 |
| Disyston 15G IFG | 0.75 | 0.2 | 0.3 | 12.0 | 8.2 |
| Orthene 90S IFS | 1.0 | 0.2 | 2.0 | 10.5 | 14.0 |
| Payload 15F IFG | 0.5 | 0.2 | 1.5 | 17.5 | 13.7 |
| Payload 15F IFG | 0.75 | 0.2 | 1.0 | 21.3 | 10.2 |
| Disyston 8E IFS | 0.75 | 0.5 | 0.7 | 16.5 | 12.5 |
| Untreated check | | 1.0 | 1.3 | 17.3 | 12.8 |
| LSD (0.05) | | 0.7 | 1.1 | 7.9 | 4.9 |

Treatments applied at planting on May 21.

IFG = in-furrow granule

IFS = in-furrow spray

Table 2. Mean lint cotton yield per acre, harvested 11 Oct, Stoneville, MS. 1993.

| Treatment | Rate (lb ai/acre) | Yield (lb/acre) |
|-------------------|----------------------|--------------------|
| Temik 15G IFG | 0.5 | 810 |
| Temik 15G IFG | 0.75 | 772 |
| Disyston 15G IFG | 0.75 | 734 |
| Orthene 90S IFS | 1.0 | 749 |
| Payload 15G IFG | 0.5 | 743 |
| Payload 15G IFG | 0.75 | 749 |
| Payload 15G IFG | 1.0 | 688 |
| Disyston 8E IFS | 0.75 | 703 |
| Untreated check | | 749 |
| LSD (0.05) | | 76 |

Treatments applied at planting on May 21.

Calculated from 100 row ft samples per plot = (lbs seed cotton/100 row ft)

* 130.69 * .35

IFG = in-furrow granule

IFS = in-furrow spray

Table 3. Mean thrips per 5 plants on 4 observation dates, Stoneville, MS. 1994.

| Treatment | Rate (lb ai/acre) | Observation Dates | | | |
|-------------------|----------------------|-------------------|------------|------------|------------|
| | | 5/24 | 5/30 | 6/6 | 6/13 |
| Payload 15G IFG | 0.5 | 0.3 | 1.8 | 1.5 | 0.5 |
| Payload 15G IFG | 0.75 | 0.0 | 2.8 | 0.8 | 3.0 |
| Payload 15G IFG | 1.0 | 0.0 | 2.3 | 0.5 | 1.3 |
| Orthene 90S IFS | 0.9 | 1.5 | 3.0 | 3.5 | 0.8 |
| Temik 15G IFG | 0.5 | 0.0 | 1.5 | 1.0 | 1.5 |
| Temik 15G IFG | 0.75 | 0.0 | 1.0 | 1.5 | 0.5 |
| Thimet 20G IFG | 0.75 | 1.3 | 0.3 | 0.0 | 0.8 |
| Thimet 20G IFG | 1.0 | 0.8 | 1.3 | 1.3 | 0.8 |
| Disyston 15G IFG | 0.75 | 0.5 | 1.8 | 1.8 | 1.3 |
| Disyston 15G IFG | 1.0 | 0.8 | 3.0 | 0.3 | 1.3 |
| Untreated check | | 5.3 | 4.5 | 0.8 | 2.5 |
| LSD (0.05) | | 1.6 | 3.5 | 2.9 | 1.6 |

Treatments applied at planting on May 12.

IFG = in-furrow granule

IFS = in-furrow spray

Table 4. Mean lint yield per acre, harvested 5 Oct, Stoneville, MS. 1994.

| Treatment | Rate (lb ai/acre) | Yield (lb/acre) |
|-------------------|----------------------|--------------------|
| Payload 15G IFG | 0.5 | 989 |
| Payload 15G IFG | 0.75 | 949 |
| Payload 15G IFG | 1.0 | 818 |
| Orthene 90S IFS | 0.9 | 812 |
| Temik 15G IFG | 0.5 | 1029 |
| Temik 15G IFG | 0.75 | 1018 |
| Thimet 20G IFG | 0.75 | 749 |
| Thimet 20G IFG | 1.0 | 960 |
| Disyston 15G IFG | 0.75 | 858 |
| Disyston 15G IFG | 1.0 | 995 |
| Untreated check | | 823 |
| LSD (0.05) | | 213 |

Treatments applied at planting on May 12.

Calculated from 50 row ft samples per plot = (lbs seed cotton/50 row ft) * 261.36 * .35.

IFG = in-furrow granule

Table 5. Mean thrips per 10 plants on 3 observation dates, Stoneville, MS. 1995.

| Treatment | Rate | Observation Dates | | |
|-------------------|--------------|-------------------|------------|-------------|
| | | 5/25 | 6/1 | 6/5 |
| Gaucha 480 ST | 8 fl oz/CWT | 0.5 | 5.0 | 3.5 |
| Temik 15G IFG | 0.5 lb ai/A | 1.0 | 2.5 | 4.0 |
| Temik 15G IFG | 0.75 lb ai/A | 1.5 | 1.3 | 2.3 |
| Payload 15G IFG | 0.75 lb ai/A | 3.3 | 3.3 | 8.8 |
| Payload 15G IFG | 1.0 lb ai/A | 1.3 | 0.8 | 5.3 |
| Untreated check | | 12.8 | 3.0 | 24.3 |
| LSD (0.05) | | 5.2 | 3.9 | 12.0 |

Treatments applied at planting on May 15.

ST = seed treatment

IFG = in-furrow granule

Table 6. Mean lint per acre yield estimates, Stoneville, MS. 1995.

| Treatment | Rate | Yield |
|------------------|---------------|------------|
| Gaucha 480 ST | 8 fl. oz./CWT | 1006 |
| Temik 15 G IFG | 0.5 lb ai/A | 1041 |
| Temik 15 G IFG | 0.75 lb ai/A | 1161 |
| Payload 15 G IFG | 0.75 lb ai/A | 918 |
| Payload 15 G IFG | 1.0 lb ai/A | 881 |
| Untreated Check | | 952 |
| LSD(0.05) | | 234 |

Harvested on 19 Sept.

Yield calculated from seed cotton weight per 100 row feet * 130.68

ST = seed treatment

IFG = in-furrow granule

Table 7. Mean thrips per 10 plants per plot on four observation dates, Stoneville, MS. 1996.

| Treatment | Rate | Observation Dates | | | |
|-----------------------------------|----------------------------|-------------------|------|------|------|
| | | 5/21 | 5/24 | 5/28 | 5/31 |
| | (lb ai/A) | | | | |
| Gaucho 480 - ST | 8 fl oz /100 wt | 2.8 | 8.5 | 23.0 | 78.0 |
| Temik 15G - IFG | 0.5 | 2.8 | 5.5 | 7.8 | 24.8 |
| Thimet 20G - IFG | 0.5 | 2.8 | 5.3 | 10.0 | 56.5 |
| Payload 15G - IFG | 0.75 | 7.0 | 4.8 | 11.0 | 64.8 |
| Payload 15G - IFG | 1.0 | 3.8 | 0.3 | 2.3 | 27.0 |
| Orthene 90S - IFS | 0.9 | 2.3 | 3.8 | 13.0 | 59.3 |
| Disyston 8E + Furadan 4F - IFS | 0.75 + 0.5 | 1.5 | 4.5 | 20.0 | 48.0 |
| Garlic + Fish Oil - IFS | 3.2 oz pr/A 3.2 oz pr/A | 16.5 | 19.0 | 24.0 | 83.3 |
| MetaSystox R 2E - IFS | 0.5 | 5.5 | 7.8 | 15.0 | 62.8 |
| UTC | | 13 | 18 | 26 | 95.0 |
| LSD (0.05) | | 6.4 | 9.2 | 11.0 | 42.9 |

Treatments applied at planting on May 7.

ST = seed treatment
IFG = in-furrow granule
IFS = in-furrow spray.

Table 8. Mean lint cotton per acre yield estimates using 35 percent turnout, Stoneville, MS. 1996.

| Treatment | Rate | Lint |
|-----------------------------------|----------------------------|-----------|
| | (lb ai/Acre) | (lb/Acre) |
| Gaucho 480 - ST | 8 oz/100 wt | 908 |
| Temik 15G - IFG | 0.5 | 982 |
| Thimet 20G - IFG | 0.5 | 890 |
| Payload 15G - IFG | 0.75 | 908 |
| Payload 15G - IFG | 1.0 | 922 |
| Orthene 90S - IFS | 0.9 | 944 |
| Disyston 8E + Furadan 4F - IFS | 0.75 + 0.5 | 990 |
| Garlic + Fish Oil - IFS | 3.2 oz pr/A 3.2 oz pr/A | 906 |
| MetaSystox R 2E - IFS | 0.5 | 970 |
| UTC | | 926 |
| LSD (0.05) | | 142 |

ST = seed treatment
IFG = in-furrow granule
IFS = in-furrow spray
Harvested 10/9/96

Table 9. Mean thrips counts per 10 seedlings on seven observation dates, Stoneville, MS. 1997.

| Treatment (rate ¹) | Observation Dates | | | | | | |
|---|-------------------|------|------|------|------|------|------|
| | 5/19 | 5/22 | 5/26 | 5/29 | 6/2 | 6/6 | 6/13 |
| Thimet 20G (0.75) IFG | 1.3 | 3.5 | 0.8 | 6.0 | 4.3 | 14.3 | 4.8 |
| Thimet 20G (1.0) IFG | 1.0 | 3.3 | 0.8 | 4.3 | 6.5 | 9.8 | 3.3 |
| Gaucho 480 ST | 0.5 | 2.5 | 3.5 | 2.3 | 8.5 | 22.5 | 7.0 |
| Temik 15G (0.5) IFG | 0.5 | 2.5 | 0.5 | 3.0 | 3.8 | 13.3 | 2.0 |
| Orthene 90S (0.75) IFS | 2.3 | 7.8 | 3.3 | 3.8 | 10.3 | 20.8 | 7.3 |
| Disyston 8EC (0.8) IFS | 1.5 | 3.8 | 1.3 | 10.0 | 5.3 | 20.0 | 4.0 |
| Admire 2F + Disyston 8EC (0.025 + 0.5) IFS | 0.5 | 5.0 | 2.0 | 5.3 | 6.0 | 18.0 | 3.5 |
| Admire 2F + Disyston 8EC (0.05 + 0.5) IFS | 0.5 | 2.3 | 1.0 | 4.8 | 6.8 | 17.8 | 5.8 |
| Admire 2F + Orthene 90S (0.025 + 0.5) IFS | 0.5 | 5.5 | 0.0 | 8.8 | 11.3 | 22.3 | 5.3 |
| Admire 2F + Orthene 90S (0.05 + 0.5) IFS | 1.3 | 4.3 | 1.0 | 1.5 | 11.0 | 27.5 | 7.5 |
| Untreated Check | 3.3 | 10.0 | 7.8 | 5.8 | 11.8 | 27.3 | 15.0 |
| LSD (p=0.05) | 1.7 | 4.6 | 3.6 | 5.1 | 6.1 | 13.4 | 8.0 |

Treatments applied at planting on May 7.

¹Rate = lb ai/A
IFG = in-furrow granule
ST = seed treatment by Gustafson, Inc.
IFS = in-furrow spray

Table 10. Mean lint yield based on estimated 35% lint turnout for cotton harvested October 7, 1997, Stoneville, MS. 1997.

| Treatment (rate ¹) | Lint/Acre |
|--|-----------|
| Thimet 20G (0.75) IFG | 1127 |
| Thimet 20G (1.0) IFG | 1175 |
| Gaucho 480 (ST) | 1287 |
| Temik 15G (0.5) IFG | 1218 |
| Orthene 90S (0.75) IFS | 1224 |
| Disyston 8EC (0.8) IFS | 1241 |
| Admire 2F + Disyston 8EC (0.025 + 0.5) IFS | 1266 |
| Admire 2F + Disyston 8EC (0.05 + 0.5) IFS | 1281 |
| Admire 2F + Orthene 90S (0.025 + 0.5) IFS | 1167 |
| Admire 2F + Orthene 90S (0.05 + 0.5) IFS | 1238 |
| Untreated Check | 1292 |
| LSD (p=0.05) | 210 |

Treatments applied at planting on May 7.

¹Rate = lb ai/A
IFG = in-furrow granule
ST = seed treatment by Gustafson Inc.
IFS = in-furrow spray

Table 11. Mean thrips per 10 plants on 2 observation dates, Stoneville, MS. 1993.

| Treatment | Rate | Pretreat 6/17 | Posttreatment 6/23 |
|------------------|------------------|---------------|--------------------|
| Pirate 3SC | 0.05 | 41.5 | 10.3 |
| Pirate 3SC | 0.10 | 38.7 | 9.5 |
| Pirate 3SC | 0.15 | 33.3 | 10.3 |
| Pirate 3SC + COC | 0.05 + 0.25% v/v | 35.7 | 11.3 |
| Bidrin 8E | 0.2 | 36.7 | 13.3 |
| Untreated check | | 34.0 | 19.7 |
| LSD (0.05) | | 12.4 | 5.0 |

Treatment application date: 6/18.
COC = crop oil concentrate

Table 12. Mean thrips per 10 plants per plot on one pretreatment date and 4 posttreatment observation dates, Stoneville, MS, 1996.

| Treatment | Rate (lb ai/A) | Observation Dates | | | | |
|-----------------|-------------------|-------------------|------|------|------|-------|
| | | 5/14 | 5/21 | 5/24 | 5/28 | 5/31 |
| | | Pretreat | | | | |
| Provado 1.6E | 0.047 | 6.3 | 8.5 | 15.0 | 2.0 | 109.0 |
| Provado 1.6E | 0.025 | 7.8 | 9.8 | 21.0 | 16.5 | 102.5 |
| Provado 1.6E | 0.025 + | 7.5 | 10.5 | 30.5 | 8.8 | 81.5 |
| +OS surfactant | 0.125% v/v | | | | | |
| Baythroid 2E | 0.015 | 7.3 | 4.8 | 20.3 | 2.3 | 47.5 |
| Baythroid 2E + | 0.015 + | 6.3 | 6 | 23.3 | 6.3 | 44.3 |
| Provado 1.6E | 0.025 | | | | | |
| Baythroid 2E + | 0.025 + | 7.0 | 4 | 16.5 | 0.8 | 23.3 |
| Provado 1.6E | 0.02 | | | | | |
| Monitor 4E | 0.1 | 7.5 | 5 | 9.8 | 2.3 | 62.8 |
| Karate 1E | 0.015 | 5.8 | 3.3 | 15.0 | 1.0 | 27.0 |
| Karate 2CS | 0.015 | 8.8 | 8.8 | 16.3 | 2.8 | 49.0 |
| Vydate CLV | 0.25 + | 7.0 | 7.8 | 15.0 | 3.3 | 94.0 |
| 3.77E + | 0.225 | | | | | |
| Lannate LV 2.4E | | | | | | |
| Fipronil 2.5EC | 0.025 | 6.5 | 2.3 | 5.8 | 1.8 | 37.3 |
| UTC | | 4.3 | 14.3 | 15.8 | 7.5 | 85.8 |
| LSD (0.05) | | 4.4 | 8.9 | 11.3 | 9.9 | 47.1 |

Treatment application dates - 5/15, 5/24.

OS = organo-silicon

Table 13. Mean lint cotton per acre yield estimates using 35 percent turnout, Stoneville, MS, 1996.

| Treatment | Rate (lb ai/A) | Lint Yield (lb/A) |
|--------------------|-------------------|----------------------|
| Provado 1.6E | 0.047 | 794 |
| Provado 1.6E | 0.025 | 790 |
| Provado 1.6E + | 0.025 + | 852 |
| OS surfactant | 0.125 % v/v | |
| Baythroid 2E | 0.015 | 834 |
| Baythroid 2E + | 0.015 + | 850 |
| Provado 1.6E | 0.025 | |
| Baythroid 2E + | 0.025 + | 788 |
| Provado 1.6E | 0.02 | |
| Monitor 4E | 0.1 | 814 |
| Karate 1E | 0.015 | 802 |
| Karate 2CS | 0.015 | 740 |
| Vydate CLV 3.77E + | 0.25 + | 862 |
| Lannate LV 2.4E | 0.225 | |
| Fipronil 2.5EC | 0.025 | 854 |
| UTC | | 682 |
| LSD (0.05) | | 116 |

Treatment application dates - 5/15, 5/24

OS = organo-silicon

Table 14. Mean thrips counts per 10 seedlings on 9 observation dates - Test I, Stoneville, MS 1997.

| Treatment (rate ¹) | Observation Date | | | | | | | |
|--------------------------------|------------------|------|------|------|-----|-----|------|------|
| | 5/22 | 5/26 | 5/29 | 6/2 | 6/4 | 6/6 | 6/9 | 6/13 |
| Orthene 90S (0.2) | 7.0 | 0.0 | 1.0 | 4.0 | 1.8 | 2.8 | 1.3 | 1.5 |
| Orthene 90S (0.5) | 5.8 | 0.0 | 2.0 | 4.0 | 1.3 | 0.8 | 0.8 | 0.5 |
| Orthene 90S (1.0) | 8.3 | 0.3 | 0.3 | 3.5 | 1.0 | 0.5 | 0.3 | 1.0 |
| Provado 1.6F (0.047) | 9.5 | 2.3 | 1.3 | 7.8 | 2.9 | 0.8 | 5.3 | 0.0 |
| Monitor 4EC (0.1) | 8.8 | 0.5 | 0.3 | 5.8 | 2.3 | 2.5 | 2.8 | 2.0 |
| Baythroid 2EC (0.015) | 12.8 | 0.0 | 0.8 | 11.5 | 2.4 | 0.5 | 1.5 | 0.3 |
| Baythroid 2EC (0.0125) | 7.5 | 0.0 | 2.0 | 10.0 | 2.7 | 0.8 | 2.5 | 1.0 |
| Bidrin 8 (0.2) | 7.0 | 0.3 | 1.3 | 3.3 | 1.8 | 4.5 | 1.0 | 0.8 |
| Disyston 8EC (0.2) | 3.8 | 2.5 | 3.8 | 7.5 | 6.6 | 8.0 | 10.8 | 7.3 |
| Untreated Check | 8.3 | 7.3 | 3.8 | 9.8 | 5.6 | 7.5 | 2.8 | 2.3 |
| LSD (p=0.05) | 3.8 | 2.9 | 3.6 | 5.7 | 1.7 | 5.8 | 4.3 | 2.6 |

¹Rate = lb ai/A

Application Dates: 5/23, 6/3.

Table 15. Mean lint yield based on estimated 35% lint turnout for cotton harvested September 29, 1997 - Test I, Stoneville, MS 1997.

| Treatment (rate ¹) | Lint/Acre |
|--------------------------------|-----------|
| Orthene 90S (0.2) | 1241 |
| Orthene 90S (0.5) | 1221 |
| Orthene 90S (1.0) | 1298 |
| Provado 1.6F (0.047) | 1269 |
| Monitor 4EC (0.1) | 1264 |
| Baythroid 2EC (0.015) | 1121 |
| Baythroid 2EC (0.0125) | 1267 |
| Bidrin 8 (0.2) | 1255 |
| Disyston 8EC (0.2) | 1178 |
| Untreated Check | 1224 |
| LSD (p=0.05) | 125 |

¹Rate = lb ai/A

Table 16. Mean thrips counts per 10 seedlings on seven observation dates - Test II, Stoneville, MS 1997.

| Treatment (rate ¹) | Observation Date | | | | | |
|--------------------------------|------------------|------|------|------|-----|------|
| | 5/22 | 5/26 | 5/29 | 6/2 | 6/6 | 6/13 |
| Ammo 2.5EC (0.025) | 8.8 | 0.3 | 1.0 | 8.0 | 0.8 | 3.0 |
| Karate 1EC (0.0125) | 6.3 | 0.5 | 0.3 | 4.8 | 0.5 | 3.3 |
| Baythroid 2EC (0.014) | 4.8 | 1.0 | 0.8 | 10.3 | 0.3 | 0.8 |
| Asana XL 0.66EC (0.015) | 8.0 | 1.0 | 2.0 | 9.0 | 0.5 | 2.3 |
| Scout Xtra 0.9EC (0.008) | 6.5 | 0.3 | 2.5 | 10.0 | 0.3 | 0.8 |
| Decis 1.5EC (0.01) | 10.3 | 1.0 | 0.5 | 4.5 | 1.0 | 1.5 |
| Bidrin 8 (0.2) | 8.0 | 0.8 | 1.0 | 10.0 | 1.3 | 3.3 |
| Orthene 90S (0.2) | 6.5 | 0.3 | 1.8 | 4.0 | 1.5 | 3.5 |
| Cygon 4EC (0.2) | 7.5 | 0.0 | 1.8 | 10.8 | 1.3 | 1.8 |
| Untreated Check | 4.5 | 6.0 | 0.3 | 10.8 | 6.0 | 4.0 |
| LSD (p=0.05) | 5.5 | 2.0 | 1.6 | 4.8 | 2.6 | 3.3 |

¹Rate = lb ai/A

Application Dates: 5/23, 6/3.

Table 17. Mean lint yield based on estimated 35% lint turnout for cotton harvested September 29, 1997 - Test II, Stoneville, MS, 1997.

| Treatment (rate ¹) | Lint/Acre |
|--------------------------------|-----------|
| Ammo 2.5EC (0.025) | 1147 |
| Karate 1EC (0.0125) | 1184 |
| Baythroid 2EC (0.014) | 1158 |
| Asana XL 0.66EC (0.015) | 1189 |
| Scout Xtra 0.9EC (0.008) | 1224 |
| Decis 1.5EC (0.01) | 1141 |
| Bidrin 8 (0.2) | 1206 |
| Orthene 90S (0.2) | 1175 |
| Cygon 4EC (0.2) | 1204 |
| Untreated Check | 1172 |
| LSD (p=0.05) | 91 |

¹Rate = lb ai/A