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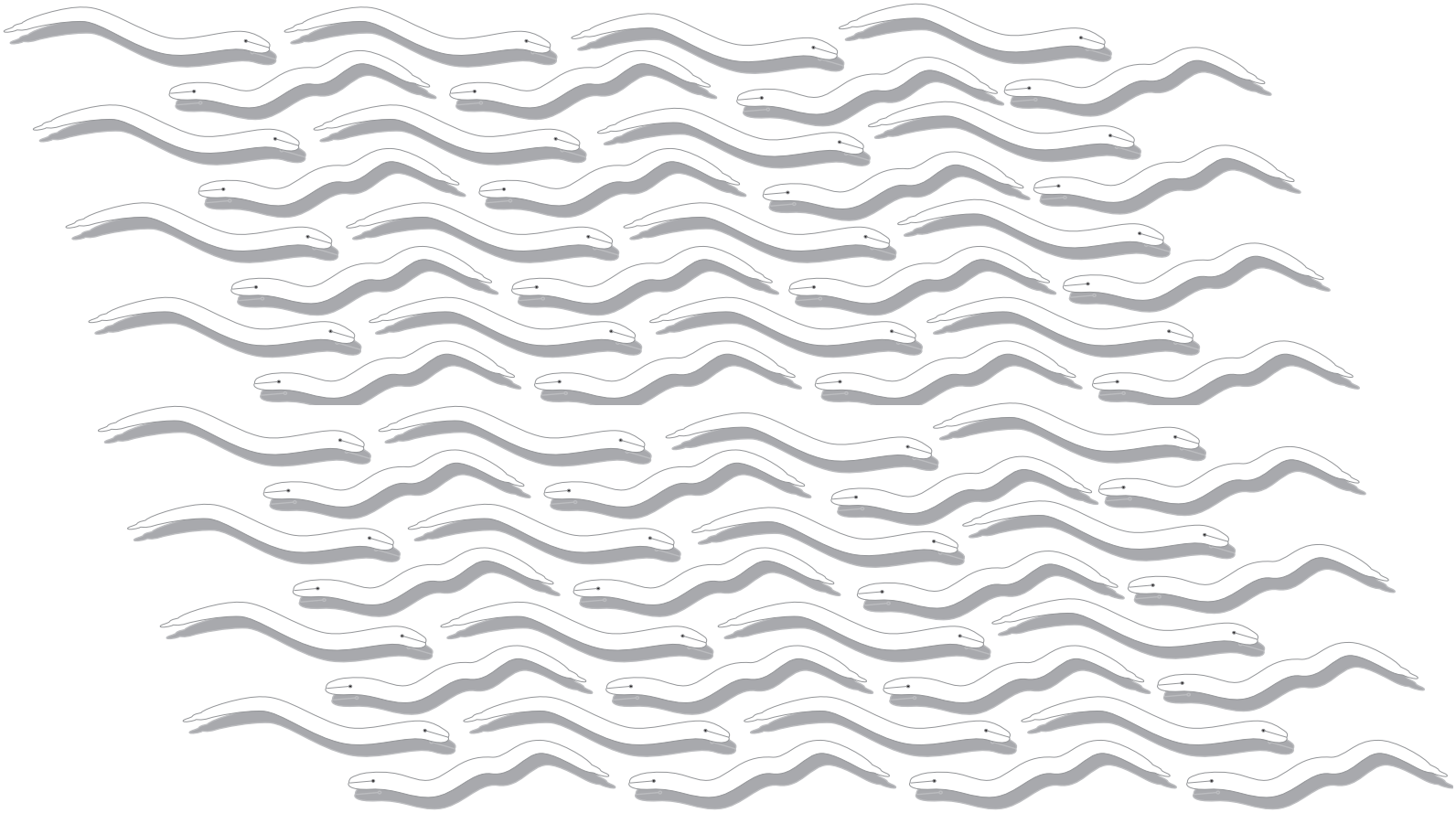
Nematode Management Investigations in Mississippi, 2004



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Nematode Management Investigations in Mississippi, 2004

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Nematode Management Investigations in Mississippi, 2004

Introduction

This summary of 2004 nematode trials on cotton and soybeans was prepared for industry cooperators, colleagues at other universities, and other interested persons. The information presented is not an endorsement or recommendation. This information is intended for private use and may not be reproduced without permission.

Trade names are used throughout this report for clarity, except where they are unavailable. A list of all chemicals used in this research — including trade, common, and chemical names when available — and company sources are included in the appendix. Nematicide rates are expressed as formulated rate per acre as suggested by manufacturers.

Data presented in this report were statistically analyzed using the Statistical Analysis System (SAS Institute Inc., Cary, N.C.). Data were subjected to ANOVA appropriate for the experimental design used, and means were separated using the least significant difference test. All statistical tests were performed at the 5% level of significance.

Single-Rate Application Methods. Temik 15G was applied at planting in the seed furrow with a Case 900 Early Riser planter equipped with a granular chemical applicator.

Telone II, was applied with a modified ripper-hipper. A CO_2-charged system was used to propel the fumigant through flow regulators mounted on stainless steel delivery tubes attached to the trailing edge of forward-swept chisels. Rows were immediately hipped with disk-hillers to seal and prevent rapid loss of the fumigant.

Gaucho was added to the seed before planting by Gustafson at their recommended rates.

Vydate C-LV was applied as a foliar spray at the 6th-true-leaf stage and again 14 days later or other specified dates. Vydate C-LV was applied with a CO_2-charged backpack field plot spray system using two 8003 flat fan nozzles spaced over each row at 30 psi.

Nematode Counts. For most tests, population densities of plant-parasitic nematodes were determined at planting and at monthly intervals for the entire growing season. Ten soil cores, 1 inch in diameter and 8 inches deep, were collected from the two center rows of each plot in a systematic randomized sampling pattern. Cores from each plot were thoroughly mixed, and a 250-cubic-centimeter subsample was collected. Nematodes were extracted using a combination of gravity sieving and centrifugal flotation (sucrose sp. gr. 1.13).

Reniform Nematode Management with Vydate C-LV Applied as a Foliar Spray

Objective: Vydate C-LV was examined in Glen Allan, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production location. Each Vydate C-LV treatment received an in-furrow application of Temik 15G at 3.5 or 5 pounds of formulated material per acre at the time of planting. These treatments were compared with applications of Temik 15G at 3.5, 5, and 7 pounds of formulated product per acre applied in the seed furrow at planting. The insecticide Di-Syston 8EC was included as an insecticide-treated control. All plots were treated with Orthene 75S at 4 ounces of formulated product per acre when thrips were detected in any plots.

Temik 15G was applied at planting with a Case 900 Early Riser planter equipped with granular chemical applicators. Vydate C-LV was applied as a foliar spray at the 6th-true-leaf stage and again 14 days later. Vydate C-LV was applied with a CO_2-charged backpack field plot spray system. A total volume of 10 gallons per acre was applied through two 8003 flat fan nozzles spaced over each row at 30 psi. All rows not treated with Vydate C-LV received a foliar spray of Orthene 75S at 4 ounces per acre.

Cultivar: PayMaster 1218

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Planting date: June 8, 2004

Application date:

June 8, 2004	Temik 15G applied in-furrow
June 18, 2004	Vydate C-LV 2 true leaf stage application Orthene 75S applied to all treatments
July 7, 2004	Vydate C-LV 5th-true-leaf stage application Orthene 75S applied to all treatments
July 9, 2004	Vydate C-LV 6th-true-leaf stage application Orthene 75S applied to all treatments
July 23, 2004	Vydate C-LV 14 days after 6th- to 7th-true-leaf stage application Orthene 75S applied to all treatments

Seed rate: 200 seeds per row

Nematode sample date:
June 9, 2004
July 13, 2004
September 1, 2004
October 30, 2004

Plant height: October 29, 2004

Harvest date: October 29, 2004

Results: See Table 1, Table 2, Table 3, Table 4 and Table 5

Table 1. Effect of Vydate C-LV applied as a foliar spray on population development of the reniform nematode.[1]

Treatment	Rate per acre[2]	Application	*R. reniformis* /500 cc soil at 0-143 days after planting				Mean[3]
			0	34	84	143	
Control	—	—	258	1084 ab	2511	6828 a	2670
Vydate C-LV + Cruiser	8.5 oz	6 leaf + 14 days	258	671 ab	4076	5418 ab	2606
Vydate C-LV	8.5 oz	2 leaf + 5 leaf	516	636 ab	3457	3629 b	2060
Vydate C-LV	12 oz	6 leaf + 14 days	516	894 ab	3165	5573 ab	2537
Vydate C-LV	12 oz	2 leaf + 5 leaf	258	1032 ab	4042	5607 ab	2735
Vydate C-LV	17 oz	6 leaf + 14 days	516	654 ab	3870	4059 ab	2275
Vydate C-LV	17 oz	2 leaf + 5 leaf	258	774 ab	2838	3973 ab	1961
Vydate C-LV + Cruiser	17 oz	2 leaf	516	1135 a	4283	4455 ab	2597
Vydate C-LV + Temik 15G	8.5 oz + 3.5 lb	6 leaf + 14 days + in-furrow	258	447 b	3543	4541 ab	2197
Vydate C-LV + Temik 15G	8.5 oz + 5 lb	6 leaf + 14 days + in-furrow	258	430 b	3870	6037 ab	2649
LSD (P=0.05)			NS	673	NS	2806	NS

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population across all sample dates.

Table 2. Effect of Vydate C-LV applied as a foliar spray on plant height, the number of nodes produced, and the first fruiting node on PayMaster 1218 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application[3]	Plant height (in)	Nodes per plant	Node of first fruiting branch
Control	—	—	33.9 b	15.5 d	6.8 ab
Vydate C-LV + Cruiser	8.05 oz	6 leaf + 14 days	39.9 ab	17.5 abc	6.7 ab
Vydate C-LV	8.5 oz	2 leaf + 5 leaf	45.2 a	17.5 abc	6.8 ab
Vydate C-LV	12 oz	6 leaf + 14 days	39.4 ab	17.3 abc	6.2 b
Vydate C-LV	12 oz	2 leaf + 5 leaf	37.3 b	16.2 cd	7.5 a
Vydate C-LV	17 oz	6 leaf + 14 days	39.7 ab	18.4 a	6.7 ab
Vydate C-LV	17 oz	2 leaf + 5 leaf	39.3 b	17.9 ab	6.7 ab
Vydate C-LV + Cruiser	17 oz	2 leaf	40.0 ab	17.5 abc	7.2 ab
Vydate C-LV + Temik 15G	8.5 oz + 3.5 lb	6 leaf + 14 days + in-furrow	38.5 b	11.8 bcd	6.2 b
Vydate C-LV + Temik 15G	8.5 oz + 5 lb	6 leaf + 14 days + in-furrow	37.6 b	16.9 abcd	7.0 ab
LSD (P=0.05)			6.4	1.5	0.9

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Vydate C-LV was applied at the 2nd-, 5th-, and 6th-true-leaf stage on June 18, July 7, and July 9, respectively.
[3]Rates calculated are based on 38-inch row spacing.

Table 3. Effect of Vydate C-LV on the number of bolls produced at the 1st, 2nd, and 3rd fruiting positions on PayMaster 1218 cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre	Application	Open bolls[3]			Total open bolls per plant
			Position 1	Position 2	Position 3	
Control	—	—	5.4 d	1.3 f	0.0 c	5.8 d
Vydate C-LV + Cruiser	8.5 oz	6 leaf + 14 days	6.8 abc	3.5 bcd	0.0 c	10.3 bc
Vydate C-LV	8.5 oz	2 leaf + 5 leaf	5.7 cd	4.5 a	0.0 c	10.2 bc
Vydate C-LV	12 oz	6 leaf + 14 days	7.7 a	3.2 cde	0.2 bc	11.0 b
Vydate C-LV	12 oz	2 leaf + 5 leaf	6.2 bc	3.0 cde	0.0 c	9.2 c
Vydate C-LV	17 oz	6 leaf + 14 days	7.0 ab	3.8 abc	0.5 ab	11.3 ab
Vydate C-LV	17 oz	2 leaf + 5 leaf	7.2 ab	2.5 e	0.0 c	9.7 abc
Vydate C-LV + Cruiser	17 oz	2 leaf	7.0 ab	2.9 de	0.5 ab	10.4 bc
Vydate C-LV + Temik 15G	8.5 oz + 3.5 lb	6 leaf + 14 days + in-furrow	8.0 a	4.3 ab	0.7 a	13.0 a
Vydate C-LV + Temik 15G	8.5 oz + 5 lb	6 leaf + 14 days + in-furrow	7.0 ab	2.5 e	0.0 c	9.5 bc
LSD (P=0.05)			1.3	0.8	0.3	1.8

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Vydate C-LV was applied at the 2nd-, 5th-, and 6th-true-leaf stage on June 18, July 7, and July 9, respectively.
[3]Average number of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls at position 3 and above.

Table 4. Effect of Vydate C-LV on the weight of open bolls produced at the 1st, 2nd, and 3rd fruiting positions on PayMaster 1218 cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application	Seed cotton weight (g)[4]			Total seed cotton weight per plant (g)
			Position 1	Position 2	Position 3	
Control	—	—	75.2 d	19.6 c	0.0	94.8 c
Vydate C-LV + Cruiser	8.5 oz	6 leaf + 14 days	109.2 bc	49.6 cd	1.6	160.4 bc
Vydate C-LV	8.5 oz	2 leaf + 5 leaf	105.5 bc	67.6 a	0.0	173.1 b
Vydate C-LV	12 oz	6 leaf + 14 days	114.7 b	38.7 cd	2.2	155.6 cd
Vydate C-LV	12 oz	2 leaf + 5 leaf	97.9 c	40.6 cd	0.0	138.5 d
Vydate C-LV	17 oz	6 leaf + 14 days	115.3 b	52.4 bc	5.2	172.9 b
Vydate C-LV	17 oz	2 leaf + 5 leaf	109.9 bc	36.6 d	0.0	146.5 cd
Vydate C-LV + Cruiser	17 oz	2 leaf	109.4 bc	40.1 cd	4.8	154.4 cd
Vydate C-LV + Temik 15G	8.5 oz + 3.5 lb	6 leaf + 14 days + in-furrow	131.3 a	64.7 ab	3.9	198.9 a
Vydate C-LV + Temik 15G	8.5 oz + 5 lb	6 leaf + 14 days + in-furrow	113.5 b	41.3 cd	0.0	154.8 cd
LSD (P=0.05)			14.1	14.2	NS	17.2

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Vydate C-LV was applied at the 2nd-, 5th-, and 6th-true-leaf stage on June 18, July 7, and July 9, respectively.
[3]Rates calculated are based on 38-inch row spacing.
[4]Weight of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls position 3 and above.

Table 5. Effect of Vydate C-LV applied as a foliar spray on the yield of PayMaster 1218 cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Control	—	—	17.95 b	3083.5 b	—
Vydate C-LV + Cruiser	8.05 oz	6 leaf + 14 days	20.77 a	3566.5 a	483.0
Vydate C-LV	8.5 oz	2 leaf + 5 leaf	21.11 a	3625.7 a	542.2
Vydate C-LV	12 oz	6 leaf + 14 days	21.00 a	3606.4 a	522.9
Vydate C-LV	12 oz	2 leaf + 5 leaf	19.05 ab	3272.2 ab	188.7
Vydate C-LV	17 oz	6 leaf + 14 days	19.63 ab	3372.2 ab	188.7
Vydate C-LV	17 oz	2 leaf + 5 leaf	20.51 ab	3522.1 ab	438.6
Vydate C-LV + Cruiser	17 oz	2 leaf	21.11 a	3625.7 a	542.2
Vydate C-LV + Temik 15G	8.5 oz + 3.5 lb	6 leaf + 14 days + in-furrow	20.71 ab	3556.5 ab	473.0
Vydate C-LV + Temik 15G	8.5 oz + 5 lb	6 leaf + 14 days + in-furrow	18.61 ab	31.96 ab	113.1
LSD (P=0.05)			2.7	479.5	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Vydate C-LV was applied at the 2nd-, 5th-, and 6th-true-leaf stage on June 18, July 7, and July 9, respectively.
[3]Rates calculated are based on 38-inch row spacing.

Management of the Reniform Nematode with Vapam and Telone II Soil Fumigants

Objective: Vapam and Telone II were examined in Church Hill, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production location. Preplanting applications of Vapam at 3 and 5 gallons per acre and Telone II at 1.5, 3, and 5 gallons per acre were compared with the standard at-planting application of Temik 15G at 5 pounds per acre. Di-Syston 8EC was included as an insecticide-treated control. All plots were treated with Orthene 75S at 4 ounces of formulated product per acre when thrips were detected in any plots.

Vapam and Telone II were applied with a modified John Deere ripper hipper. A CO_2-charged system was used to propel the fumigant through flow regulators mounted on stainless steel delivery tubes attached to the trailing edge of forward-swept chisels. The fumigant was injected 16 inches deep 32 days before planting with one chisel per row. Rows were immediately hipped with disk hillers to seal and prevent rapid loss of the fumigant. All remaining rows were subsoiled 16 inches deep and hipped without applying the fumigant. Temik 15G was applied at planting with a Case 900 Early Riser planter equipped with granular chemical applicators.

Cultivar: PayMaster 1218

Experimental design: Randomized complete block with five replications

Plot design: Four-row plots; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

April 17, 2004	Telone II injected
	Vapam injected
June 8, 2004	Temik 15G applied in-furrow
June 18, 2004	Orthene 75S applied to all treatments
June 21, 2004	Orthene 75S applied to all treatments

Planting date: June 8, 2004

Seed rate: 200 seeds per row

Nematode sample date:
June 9, 2004
July 13, 2004
September 26, 2004
October 30, 2004

Plant height: October 29, 2004

Harvest date: October 29, 2004

Results: See Table 6, Table 7, Table 8, Table 9, and Table 10

Table 6. Effect of Vapam and Telone II on population development of reniform nematode on PM 1218 cotton.[1]

Treatment	Rate per acre[2]	Application method	*R.reniformis* /500cm soil at 0-123 days after planting				Mean[3]
			0	34	84	143	
Control	—	—	309.6	258.0 b	1496.4 ab	7843	2476.8
Vapam	3 gal	Single chisel, 16" deep, preplant	309.6	120.4 b	774.0 b	7172	2094.1
Vapam	5 gal	Single chisel, 16" deep, preplant	258.0	86.0 b	2064.0 ab	6295	2175.8
Temik 15 G	5 lb	In-furrow, at-plant	361.2	206.4 b	2528.4 a	7018	2528.4
Telone II	1.5 gal	Single chisel, 16" deep, preplant	258.0	464.4 a	877.2 b	4696	1573.8
Telone II	3 gal	Single chisel, 16" deep, preplant	309.6	120.4 b	1083.6 b	9236	2687.5
Telone II	5 gal	In-furrow, at-plant	258.0	154.8 b	1909.2 ab	5366	1922.1
LSD (P=0.05)			NS	205.6	1392	NS	NS

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population density across sample dates.

Table 7. Effect of Vapam and Telone II on the plant height, number of nodes produced, and first fruiting node on PM 1218 in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Plant height (in)	Nodes per plant	Node of first fruiting branch
Control	—	—	35.0 e	16.2 c	6.3
Vapam	3 gal	Single chisel, 16" deep, preplant	37.1 d	17.7 ab	6.7
Vapam	5 gal	Single chisel, 16" deep, preplant	40.3 ab	18.7 a	7.0
Temik 15 G	5 lb	In-furrow, at-plant	39.2 bc	17.0 bc	7.4
Telone II	1.5 gal	Single chisel, 16" deep, preplant	38.1 cd	17.2 bc	6.6
Telone II	3 gal	Single chisel, 16" deep, preplant	39.9 abc	17.2 bc	6.5
Telone II	5 gal	Single chisel, 16" deep, preplant	41.5 a	16.3 c	6.5
LSD (P=0.05)			1.8	1.2	NS

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates were calculated based on 38-inch row spacing.

Table 8. Effect of Vapam and Telone II on the numbers of bolls produced at the 1st, 2nd, and 3rd fruiting positions on PM 1218 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Open bolls[3]			Total open bolls per plant
			Position 1	Position 2	Position 3	
Control	—	—	5.7 ab	0.9 d	0.2	6.7 c
Vapam	3 gal	Single chisel, 16" deep, preplant	5.8 ab	2.9 bc	0.2	8.8 b
Vapam	5 gal	Single chisel, 16" deep, preplant	6.7 a	2.7 bc	0.5	9.9 ab
Temik 15 G	5 lb	In-furrow, at-plant	5.2 b	1.9 cd	0.2	7.2 c
Telone II	1.5 gal	Single chisel, 16" deep, preplant	5.0 b	3.5 ab	0.7	9.2 b
Telone II	3 gal	Single chisel, 16" deep, preplant	6.4 a	4.3 a	0.2	10.8 a
Telone II	5 gal	Single chisel, 16" deep, preplant	5.9 ab	2.7 bc	0.7	9.2 b
LSD (P=0.05)			1.1	1.3	NS	1.5

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates were calculated based on 38-inch row spacing.
[3]Average number of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls at position 3 and above.

Table 9. Effect of Vapam and Telone II on the weight of open bolls produced at the 1st, 2nd, and 3rd fruiting positions on PM 1218 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton weight (g)[3]			Total seed cotton weight per plant (g)
			Position 1	Position 2	Position 3	
Control	—	—	63.2 c	13.3 b	1.1 c	77.5 d
Vapam	3 gal	Single chisel, 16” deep, preplant	93.3 ab	41.9 a	3.8 bc	138.9 b
Vapam	5 gal	Single chisel, 16” deep, preplant	105.9 a	36.3 a	9.1 ab	151.2 a
Temik 15 G	5 lb	In-furrow, at-plant	64.6 c	27.5 ab	2.2 bc	94.3 c
Telone II	1.5 gal	Single chisel, 16” deep, preplant	88.9 b	41.1 a	13.0 a	142.9 ab
Telone II	3 gal	Single chisel, 16” deep, preplant	101.3 ab	41.9 a	3.4 bc	146.6 ab
Telone II	5 gal	Single chisel, 16” deep, preplant	90.9 ab	34.9 a	11.5 a	137.4 b
LSD (P=0.05)			15.5	15.3	6.9	10.1

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates were calculated based on 38-inch row spacing.
[3]Average weight of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls at position 3 and above.

Table 10. Effect of Vapam and Telone II on the yield of PM 1218 in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Control	—	—	17.2	2960.6	—
Vapam	3 gal	Single chisel, 16” deep, preplant	18.7	3207.0	123.2
Vapam	5 gal	Single chisel, 16” deep, preplant	19.6	3361.2	200.3
Temik 15 G	5 lb	In-furrow, at-plant	17.3	2975.8	7.6
Telone II	1.5 gal	Single chisel, 16” deep, preplant	18.1	3105.2	72.3
Telone II	3 gal	Single chisel, 16” deep, preplant	16.9	2896.4	-32.1
Telone II	5 gal	Single chisel, 16” deep, preplant	18.2	3127.2	83.3
LSD (P=0.05)			NS	NS	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates were calculated based on 38-inch row spacing.

Reniform Nematode Management with Temik 15G, KC 791230, and Three Experimental Seed Treatments Applied In-Furrow and as Sidedress Treatments

Objective: Temik 15G, KC 791230, and three experimental seed treatments were examined in Church Hill, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production system.

Temik 15G and KC791230 were applied at planting in the seed furrow or as a sidedress treatment to plants that were in the 10th-true-leaf growth stage. In-furrow treatments of both Temik 15G and KC 791230 were applied at 5 and 7 pounds per acre. The sidedress treatment rates were 5 pounds per acre in combination with a 5-pound-per-acre in-furrow rate applied at planting. The seed treatments were treated by Bayer.

Temik 15G and KC 791230 in-furrow treatments were applied with a Case 900 Early Riser planter equipped with granular chemical applicators. Sidedress applications were placed approximately 6 inches deep on each side of the row with rolling coulters.

All plots were treated with Orthene 75S at 4 ounces of formulated product per acre when thrips were detected in any plots.

Cultivar: FiberMax 960

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

June 8, 2004	Temik 15G and KC 791230 applied in-furrow
June 18, 2004	Temik 15G and KC 791230 applied in-furrow
	Orthene 75S applied to all treatments

Planting date: June 8, 2004

Seed rate: 200 seeds per row

Nematode sample date:
June 9, 2004
July 13, 2004
September 1, 2004

Plant height: October 29, 2004

Harvest date: October 29, 2004

Results: See Table 11 and Table 12

Table 11. Effect of Temik 15G, KC 791230, and three experimental seed treatments on population development of the reniform nematode on FiberMax 960.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis*/500 cc soil at 0-143 days after planting				Mean[3]
			0	34	84	143	
Untreated	—	—	310 b	877 ab	1961	8720 ab	2967 ab
Temik 15G	5 lb	In-furrow	258 c	533 abc	2786	4592 b	2043 b
KC 791230	5 lb	In-furrow	516 a	103 c	1238	9546 ab	2851 ab
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress	516 a	671 abc	2391	6037 b	2404 b
KC 791230 + KC 791230	5 lb + 5 lb	In-furrow + sidedress	516 a	327 bc	2769	7430 b	2761 ab
Temik 15G	7 lb	In-furrow	258 c	568 abc	2580	8875 ab	3070 ab
KC 791230	7 lb	In-furrow	258 c	722 abc	2786	7534 b	2825 ab
Exp 1	—	Seed treatment	258 c	189 bc	3096	13261 a	4201 a
Exp 2	—	Seed treatment	258 c	1084 a	2528	8772 ab	3161 ab
Exp 3	—	Seed treatment	258 c	241 bc	2064	6295 b	2215 b
LSD (P=0.05)			46	743	NS	5617	1642

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population density across all sample dates.

Table 12. Effect of Temik 15G, KC 791230, and three experimental seed treatments on the yield of FiberMax 960 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Untreated	—	—	14.87 b	2553.40 b	—
Temik 15G	5 lb	In-furrow	14.86 b	2551.60 b	-1.8
KC 791230	5 lb	In-furrow	17.48 ab	3001.70 ab	448.3
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress	18.73 a	3217.10 a	663.7
KC 791230 + KC 791230	5 lb + 5 lb	In-furrow + sidedress	17.76 ab	3050.90 ab	497.5
Temik 15G	7 lb	In-furrow	16.07 ab	2760.40 ab	207.0
KC 791230	7 lb	In-furrow	17.91 ab	30.75.6 ab	522.2
Exp 1	—	Seed treatment	16.93 ab	2907.80 ab	354.4
Exp 2	—	Seed treatment	18.00 ab	3091.80 ab	538.4
Exp 3	—	Seed treatment	18.72 a	3214.50 a	661.1
LSD (P=0.05)			3.7	645.6	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.

Effect of Visible as a Soil Additive on the Growth of Cotton in a Reniform-Nematode-Infested Field

Objective: Visible was examined for its effects on cotton growth and subsequent yields in Glen Allan, Mississippi. The objectives of this test were to determine if the enhanced root and plant growth provided by Visible would benefit cotton production when used in the presence of the reniform nematode.

The test was conducted in an established cotton production location and naturally infested with the reniform nematode (*Rotylenchulus reniformis*). The enhanced growth effects were compared with an at-planting application of Temik 15G at 5 pounds of formulated product per acre. The insecticide Di-Syston 8EC was included as an insecticide treatment with the control at 1 pound of active ingredient per acre. Orthene 75S was applied at 4 ounces of formulated product per acre when thrips were detected in any plots.

Temik 15G and the granular formulation of Visible were applied at planting with a Case 900 Early Riser planter equipped with granular chemical applicators. Vydate C-LV was applied as a foliar spray at the 6th-true-leaf stage. Vydate C-LV was applied with a CO_2-charged backpack field plot spray system. A total volume of 10 gallons per acre was applied through two 8003 flat fan nozzles spaced over each row at 30 psi.

Cultivar: ST 5599 BG/RR

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots with two row borders; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

April 23, 2004	Visible applied in-furrow
	Temik 15G applied in-furrow
May 17, 2004	Orthene 75S applied to all treatments
June 4, 2004	Orthene 75S applied to all treatments
	Vydate C-LV applied as a foliar spray

Planting date: April 23, 2004

Seed rate: 200 seeds per row

Nematode sample date:
April 23, 2004
May 26, 2004
July 8, 2004
August 12, 2004

Results: See Table 13 and Table 14

Table 13. Effect of Visible on population development of the reniform nematode on ST 5599 BG/RR cotton.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* /500 cc soil at 0-112 days after planting				Mean[3]
			0	33	76	112	
Control	—	—	51.6	51.6 b	2322 ab	2477 ab	1255.5 ab
Visible	3 lb	In-furrow	86.0	120.4 ab	929 b	2786 ab	980.4 b
Visible	5 lb	In-furrow	37.4	34.4 b	2735 ab	2374 ab	1294.3 ab
Visible	10 lb	In-furrow	34.4	68.8 ab	1686 ab	1342 b	782.6 ab
Visible + Temik 15G	3 lb + 3.5 lb	In-furrow + in-furrow	51.6	86.0 ab	1600 ab	3354 ab	1272.8 ab
Visible + Temik 15G	5 lb + 3.5 lb	In-furrow + in-furrow	51.6	172.0 a	3922 a	1496 a	1410.4 ab
Visible + Temik 15G	3 lb + 5 lb	In-furrow + in-furrow	103.2	86.0 ab	2391 ab	2786 ab	1341.6 ab
Visible + Vydate C-LV	5 lb + 17 oz	In-furrow + 6 true leaf	34.4	51.6 b	1032 b	2632 ab	937.4 ab
Vydate C-LV	17 oz	6 true leaf	34.4	51.6 b	1703 ab	4661 a	1612.5 a
Temik 15G	3.5 lb	In-furrow	103.2	68.8 ab	1049 b	1754 b	743.9 ab
Temik 15G	5 lb	In-furrow	34.4	68.8 ab	980 ab	1806 b	7224.0 b
LSD (P=0.05)			NS	110.4	2522	2545	868.8

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population across all sample dates.

Table 14. Effect of Visible on the yield of ST 5599 BG/ RR cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Control	—	—	24.9 d	4270.0 d	—
Visible	3 lb	In-furrow	26.5 abcd	4554.4 abcd	284.4
Visible	5 lb	In-furrow	26.8 abcd	4597.0 abcd	327.0
Visible	10 lb	In-furrow	25.8 cd	4438.3 cd	168.3
Visible + Temik 15G	3 lb + 3.5 lb	In-furrow + in-furrow	27.2 abcd	4663.6 abcd	393.6
Visible + Temik 15G	5 lb + 3.5 lb	In-furrow + in-furrow	26.7 abcd	4591.5 abcd	321.5
Visible + Temik 15G	3 lb + 5 lb	In-furrow + in-furrow	28.9 ab	4966.6 ab	696.6
Visible + Vydate C-LV	5 lb + 17 oz	In-furrow + 6 true leaf	26.6 abcd	4575.7 abcd	305.7
Vydate C-LV	17 oz	6 true leaf	26.0 cd	4463.7 cd	193.7
Temik 15G	3.5 lb	In-furrow	26.3 bcd	4518.0 bcd	248.0
Temik 15G	5 lb	In-furrow	29.4 a	5042.9 a	772.9
LSD (P=0.05)			2.9	499.6	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Vydate C-LV was applied at the 6th-true-leaf stage on June 4, 2004
[3]Rates calculated are based on 38-inch row spacing.

Effect of Visible, Jenner-8 Plus, and Earthworm Tea as Soil Additives on the Growth of Cotton in a Reniform-Nematode-Infested Field

Objective: Visible, Jenner-8 Plus, and Earthworm Tea were examined for their effects on cotton growth and subsequent yields in Church Hill, Mississippi. The objectives of this test were to determine if the enhanced root and plant growth provided by these materials would benefit cotton production when used in the presence of the reniform nematode.

The test was conducted in an established cotton production location and naturally infested with the reniform nematode (*Rotylenchulus reniformis*). The enhanced growth effects were compared with an at-planting application of Temik 15G at 5 pounds of formulated product per acre. The insecticide Di-Syston 8EC was included as an insecticide treatment with the control at 1 pound of active ingredient per acre. Orthene 75S was applied at 4 ounces of formulated product per acre when thrips were detected in any plots.

Temik 15G and the granular formulation of Visible were applied at planting with a Case 900 Early Riser planter equipped with granular application of Visible and Jenner-8 Plus were applied in the seed furrow with a single flat fan 8003 nozzle positioned in front of the seed furrow closing disk. The earthworm tea was applied as a soil drench calibrated to deliver 20 gallons per acre. Vydate C-LV was applied as a foliar spray at the 6th-true-leaf stage. Vydate C-LV was applied with a CO_2- charged backpack field plot spray system.

Cultivar: PM 1218

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots with two row borders; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

June 8, 2004	Visible applied in-furrow
	Temik 15G applied in-furrow
	Jenner-8 Plus applied in-furrow
June 18, 2004	Orthene 75S applied to all treatments
June 21, 2004	Orthene 75S applied to all treatments
July 9, 2004	Vydate C-LV applied as a foliar spray
July 22, 2004	Earthworm Tea applied as a drench

Planting date: June 8, 2004

Seed rate: 200 seeds per row

Nematode sample date:
June 9, 2004
July 13, 2004
September 17, 2004
October 29, 2004

Plant height: October 29, 2004

Harvest date: October 29, 2004

Results: See Table 15, Table 16, Table 17, Table 18, and Table 19

Table 15. Effect of organic nontoxic compounds on population development of the reniform nematode on PayMaster 1218 cotton.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* /500 cc soil at 0-143 days after planting				Mean[3]
			0	34	84	143	
Control	—	—	258 d	774.0 cde	5418 a	6708 ab	3289.5
Visible	3 lb	In-furrow	1032 a	1548.0 a	4128 ab	5676 b	3096.0
Visible	5 lb	In-furrow	258 d	516.0 ef	2976 bc	5676 b	2356.4
Visible	10 lb	In-furrow	516 b	172.0 f	4217 ab	7482 ab	3121.8
Visible + Temik 15G	3 lb + 3.5 lb	In-furrow + in-furrow	1032 a	172.0 f	3681 ab	8583 ab	3366.9
Visible + Temik 15G	5 lb + 3.5 lb	In-furrow + in-furrow	258 d	1548.0 a	3939 ab	9460 ab	3801.2
Visible + Temik 15G	3 lb + 5 lb	In-furrow + in-furrow	464 c	1032.0 bcd	3285 abc	8789 ab	3392.7
Visible + Vydate C-LV	5 lb + 17 oz	In-furrow + 6 true leaf	1032 a	602.0 def	1428 c	11679 a	3685.1
Temik 15G	3.5 lb	In-furrow	516 b	1032.0 bcd	2580 bc	10406 ab	3633.5
Temik 15G	5 lb	In-furrow	1032 a	928.8 cde	3285 abc	10389 ab	3908.7
Jenner-8 Plus	15 gal	In-furrow	258 d	1548.0 a	2976 bc	5246 b	2506.9
Visible	1 pt	In-furrow	516 b	1135.0 abc	3027 bc	7276 ab	2988.5
E-Tea	20 gal	In-furrow	1032 a	1238.4 ab	3681 ab	6708	3164.8
LSD (P=0.05)			39	450.7	2187	5384.3	NS

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population density across all sample dates.

Table 16. Effect of organic nontoxic compounds on the plant height, number of nodes produced, and the first fruiting node of selected treatments on PayMaster 1218 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Plant height (in)	Nodes per plant	Node of first fruiting branch
Control	—	—	32.1 b	14.9 b	7.0 bc
Visible	3 lb	In-furrow	36.8 a	17.0 a	7.2 bc
Visible	5 lb	In-furrow	37.8 a	17.0 a	6.7 c
Visible + Temik 15G	5 lb + 3.5 lb	In-furrow + in-furrow	38.3 a	17.7 a	7.2 bc
Temik 15G	5 lb	In-furrow	35.6 ab	16.9 a	7.3 ab
Jenner-8 Plus	15 gal	In-furrow	38.6 a	17.5 a	7.9 a
E-Tea	20 gal	In-furrow	37.3 a	16.9 a	7.0 bc
LSD (P=0.05)			4.5	1.1	0.6

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.

Table 17. Effect of organic nontoxic compounds on the number of bolls produced at the 1st, 2nd, and 3rd fruiting position of selected treatments on PayMaster 1218 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre	Application method	Open bolls[2]			Total open bolls per plant
			Position 1	Position 2	Position 3	
Control	—	—	3.7 c	0.9 c	0.0 b	4.5 b
Visible	3 lb	In-furrow	5.8 b	4.5 a	0.0 b	10.3 a
Visible	5 lb	In-furrow	6.5 ab	3.4 b	0.7 b	10.0 a
Visible + Temik 15G	5 lb + 3.5 lb	In-furrow + In-furrow	7.0 A	2.8 b	0.7 a	10.5 a
Temik 15G	5 lb	In-furrow	5.9 b	2.7 b	0.4 ab	8.9 a
Jenner-8 Plus	15 gal	In-furrow	7.0 a	2.6 b	0.4 ab	10.0 a
E-Tea	20 gal	In-furrow	6.5 ab	3.5 ab	0.0 b	10.0 a
LSD (P=0.05)			1.1	1.0	0.4	1.9

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Average number of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls at position 3 and above.

Table 18. Effect of organic nontoxic compounds on the weight of open bolls produced at the 1st, 2nd, and 3rd fruiting positions of selected treatments on PayMaster 1218 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton weight (g)[3]			Total seed cotton weight per plant (g)
			Position 1	Position 2	Position 3	
Control	—	—	63.8 e	13.5 e	0.0 c	77.2 d
Visible	3 lb	In-furrow	109.7 ab	72.2 a	0.0 c	181.9 ab
Visible	5 lb	In-furrow	92.9 d	53.3 b	3.2 bc	152.4
Visible + Temik 15G	5 lb + 3.5 lb	In-furrow + in-furrow	119.4 a	58.9 b	8.8 a	187.0 a
Temik 15G	5 lb	In-furrow	95.2 cd	43.9 c	6.3 ab	145.4 c
Jenner-8 Plus	15 gal	In-furrow	120.1 a	28.1 d	3.5 abc	151.6 c
E-Tea	20 gal	In-furrow	105.9 bc	51.6 bc	0.0 c	157.5 bc
LSD (P=0.05)			12.9	12.0	5.5	25.6

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Weight of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls position 3 and above.

Table 19. Effect of organic nontoxic compounds on the yield of PayMaster 1218 cotton.[1]

Treatment[2]	Rate per acre[2]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Control	—	—	17.2 bc	2957.0 a	—
Visible	3 lb	In-furrow	19.4 b	3334.4 b	377.4
Visible	5 lb	In-furrow	19.4 b	3329.0 b	372.0
Visible	10 lb	In-furrow	16.3 bc	2790.6 bc	-166.4
Visible + Temik 15G	3 lb + 3.5 lb	In-furrow + in-furrow	18.4 bc	3156.6 bc	1996.0
Visible + Temik 15G	5 lb + 3.5 lb	In-furrow + in-furrow	16.8 bc	2889.4 bc	-67.6
Visible + Temik 15G	3 lb + 5 lb	In-furrow + in-furrow	17.0 bc	2919.0 bc	-38.0
Visible + Vydate C-LV	5 lb + 17 oz	In-furrow + 6 true leaf	17.9 bc	3077.2 bc	120.2
Temik 15G	3.5 lb	In-furrow	17.8 bc	3062.6 bc	105.6
Temik 15g	5 lb	In-furrow	18.7 bc	3208.0 bc	251.0
Jenner-8 Plus	15 gal	In-furrow	17.4 bc	2995.2 bc	38.2
Visible	1 pt	In-furrow	19.1 bc	3287.2 bc	330.2
E-Tea	20 gal	In-furrow	24.7 a	4248.0 a	1291.0
LSD (P=0.05)			3.4	587.8	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.

Reniform Nematode Management with Temik 15G Alone and in Combination with Gaucho Seed Treatment

Objective: Temik 15G and a combination of Temik 15G plus Gaucho were examined in Glen Allan, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production system.

Temik 15G was applied at planting in the seed furrow or as a sidedress treatment to plants that were in the 10th-true-leaf growth stage. In-furrow Temik 15G was applied at 5 pounds per acre. The sidedress treatment was 5 pounds per acre in combination with a 5-pound-per-acre in-furrow rate applied at planting. The Gaucho seed treatment was applied to the seed by Bayer.

Temik 15G in-furrow treatments were applied with a Case 900 Early Riser planter equipped with granular chemical applicators. Sidedress applications were placed approximately 6 inches deep on each side of the row with rolling coulters.

All plots were treated with Orthene 75S at 4 ounces of formulated product per acre when thrips were detected in any plots.

Cultivar: DP 555 BR

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

April 23, 2004	Temik 15G applied in-furrow
June 4, 2004	Temik 15G sidedress treatment
June 17, 2004	Orthene 75S applied to all treatments

Planting date: April 23, 2004

Seed rate: 200 seeds per row

Nematode sample date:
April 23, 2004
May 26, 2004
July 8, 2004

Results: See Table 20 and Table 21

Table 20. Effect of Temik 15G and Gaucho on population development of the reniform nematode on DP 555 BR cotton.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* /500 cc soil at 0-112 days after planting			Mean[3]
			0	33	76	
Control	—	—	52	52	636 b	247 b
Gaucho	8 fl. oz / cwt seed	Seed treatment	69	86	894 b	350 b
Gaucho + Temik 15G	8 fl. oz / cwt seed + 5 lb	Seed treatment + In-furrow	52	69	2632 a	917 a
Temik 15G	5 lb	In-furrow	69	275	1032 b	459 b
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress	34	52	533 b	206 b
Gaucho + Temik 15G	8 fl. oz / cwt seed + 5 lb	Seed treatment + sidedress	34	69	9288 b	344 b
LSD (P=0.05)			NS	NS	938	319

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population density across all sample dates.

Table 21. Effect of Temik 15G and Gaucho on the yield of DP 555 BR cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Control	—	—	19.91 ab	3420.1 b	—
Gaucho	8 fl. oz / cwt seed	Seed treatment	20.63 a	3543.8 a	123.7
Gaucho + Temik 15G	8 fl. oz / cwt seed + 5 lb	Seed treatment + In-furrow	20.15 ab	3461.0 ab	40.9
Temik 15G	5 lb	In-furrow	17.34 b	2986.6 b	-433.5
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress	19.66 ab	3033.3 ab	-386.8
Gaucho + Temik 15G	8 fl. oz / cwt seed + 5 lb	Seed treatment + sidedress	20.36 ab	3497.4 ab	77.3
LSD (P=0.05)			3.10	529.0	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Temik 15G was applied as a sidedress treatment on June 4, 2004.
[3]Rates calculated are based on 38-inch row spacing.

Effect of STAN and Temik 15G on the Management of the Reniform Nematode

Objective: STAN (seed treatment against nematodes) and Temik 15G were examined in Glen Allan, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production system.

Cotton seed (Delta and Pine Land DP 451 BR) was treated with Dynasty CST 1.04 FS, 25 active ingredient ga/100Kg per seed, Cruiser 5 FS, 0.34 Mga per seed and with 0.12 Mga or 0.15 Mga Abamectin per seed by Syngenta. Temik 15G was applied at planting in the seed furrow at formulated rates of 3.5 pounds and 5 pounds per acre. Vydate C-LV was applied as a foliar spray at a formulated rate of 8.5 ounces per acre when the cotton plant had reached the 6th-true-leaf physiological growth stage. A second Vydate C-LV application was applied 14 days later. Visible was applied in the seed furrow at a formulated rate of 5 pounds per acre.

Temik 15G and Visible in-furrow treatments were applied with a 900 Early Riser planter equipped with granular chemical applicators. Vydate C-LV was applied as a foliar spray at the 6th-true-leaf stage and again 14 days later. Vydate C-LV was applied with a CO_2-charged backpack field plot spray system. A total volume of 10 gallons per acre was applied through two 8003 flat fan nozzles spaced over each row at 30 psi. All rows not treated with Vydate C-LV received a foliar spray of Orthene 75S at 4 ounces per acre.

Cultivar: DP 451 BR

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

April 23, 2004	Temik 15G applied in-furrow
May 17, 2004	Orthene 75S applied to all treatments
June 4, 2004	Vydate C-LV applied at 6th true leaf
	Orthene 75S applied to all treatments
June 18, 2004	Vydate C-LV second application
	Orthene 75S applied to all treatments

Planting date: April 23, 2004

Seed rate: 200 seeds per row

Nematode sample date:
April 23, 2004
May 26, 2004
July 8, 2004
August 12, 2004

Harvest date: October 7, 2004

Results: See Table 22 and Table 23

Table 22. Effect of STAN and Temik 15G on population development of the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* /500 cc soil at 0-112 days after planting				Mean[3]
			0	33	76	112	
Control	—	—	69	258 a	671 a	5934	1733
STAN	0.12 Mga	Seed treatment	34	206 ab	2012 ab	4489	1685
STAN	0.15 Mga	Seed treatment	34	69 b	980 bc	4059	1286
Temik 15G	3.5 lb	In-furrow	68	103 ab	1548 abc	4180	1475
Temik 15G	5 lb	In-furrow	34	138 ab	1032 abc	5108	1578
STAN + Vydate C-LV	0.15 Mga + 8.5 oz	Seed treatment + 6 true leaf + 14 days	17	120 ab	671 a	4799	1402
STAN + Visible	0.15 Mga + 5 lb	Seed treatment + In-furrow	17	120 ab	2167 b	5831	2034
LSD (P=0.05)			NS	176	115	NS	NS

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population across all sample dates.

Table 23. Effect of STAN and Temik 15G on the yield of DP 451 BR cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Untreated	—	—	27.0 b	4643.7 b	—
STAN	0.12 Mga	Seed treatment	31.4 ab	5390.2 ab	746.5
STAN	0.15 Mga	Seed treatment	28.4 ab	4884.9 ab	241.2
Temik 15G	3.5 lb	In-furrow	28.7 ab	4926.8 ab	283.1
Temik 15G	5 lb	In-furrow	29.2 ab	5014.7 ab	371.0
STAN + Vydate C-LV	0.15 Mga + 8.5 oz	Seed treatment + 6 true leaf + 14 days	29.8 ab	5132.2 ab	488.5
STAN + Visible	0.15 Mga + 5 lb	Seed treatment + In-furrow	29.2 ab	5018.1 ab	374.4
LSD (P=0.05)			3.2	550	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.

Effect of STAN, Prepack Variants of STAN, and Temik 15G on the Management of the Reniform Nematode

Objective: STAN (seed treatment against nematodes), three prepack variants of STAN, and Temik 15G were examined in Glen Allan, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production system.

Cotton seed of ST 5599 BR was treated with Cruiser 5 FS, 0.34 Mga or 0.15 Mga per seed and/or with 0.12 Mga Abamectin per seed by Syngenta. Temik 15G was applied at planting in the seed furrow at a formulated rates of 5 pounds per acre.
Temik 15G was applied with a Case 900 Early Riser planter equipped with granular chemical applicators. All plants received a foliar spray of Orthene 75S at 4 ounces per acre when early season insects were detected in any plot.

Cultivar: ST 5599 BR

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

April 23, 2004	Temik 15G applied in-furrow
May 17, 2004	Orthene 75S applied to all treatments

Planting date: April 23, 2004

Seed rate: 200 seeds per row

Nematode sample date:
April 23, 2004
May 26, 2004
July 8, 2004
August 12, 2004

Harvest date: October 7, 2004

Results: See Table 24 and Table 25

Table 24. Effect of STAN, prepack variants of STAN, and Temik 15G on the population development of the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* /500 cc soil at 0-112 days after planting				Mean[3]
			0	33	76	112	
Control	—	—	378 a	52	1410 ab	5624	1866
Cruiser 5FS	0.34 Mga/seed	Seed treatment	17 b	17	3612 a	3612	1815
Cruiser + STAN	0.15 Mga/seed + 0.12 Mga/seed	Seed treatment	34 b	34	1737 ab	5263	1767
Prepack Variant A	—	Seed treatment	224 ab	69	1135 b	4334	1441
Prepack Variant B	—	Seed treatment	34 b	34	1995 ab	5005	1767
Prepack Variant C	—	Seed treatment	34 b	34	1806 ab	5057	1733
Temik 15G	5 lb	In-furrow	34 b	34	2649 ab	3285	1501
LSD (P=0.05)			294	NS	2438	NS	NS

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population across all sample dates.

Table 25. Effect of STAN, prepack variants of STAN, and Temik 15G on the yield of ST 5599 BG/RR cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Untreated	—	—	20.72 b	3559.6 b	—
Cruiser 5FS	0.34 Mga/seed	Seed treatment	23.10 a	3967.7 a	408.1
Cruiser + STAN	0.15 Mga/seed + 0.12 Mga/seed	Seed treatment	22.92 a	3936.7 a	377.1
Prepack Variant A	—	Seed treatment	24.37 a	4185.4 a	625.8
Prepack Variant B	—	Seed treatment	22.46 a	4030.2 a	470.6
Prepack Variant C	—	Seed treatment	23.57 a	4048.7 a	489.1
Temik 15G	5 lb	In-furrow	22.94 a	3939.5 a	379.9
LSD (P=0.05)			1.80	317.0	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.

Effect of STAN, Telone II, and Temik 15G on the Management of the Reniform Nematode

Objective: STAN (seed treatment against nematodes) and Temik 15G were examined in Church Hill, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production system.

Cotton seed (Delta and Pine Land DP 444 BR) was treated with Cruiser 5 FS, 0.34 Mga per seed and 0.10 Mga or 0.15 Mga Abamectin per seed by Syngenta. Temik 15G was applied at planting in the seed furrow at a formulated rate of 5 pounds per acre. Telone II was injected in the row at a rate of 3 or 5 gallons per acre. All plants received a foliar spray of Orthene 75S at 4 ounces per acre when early-season insects were detected in any plots.

Temik 15G was applied with a Case 900 Early Riser planter equipped with granular chemical applicators. Telone II was applied with a modified John Deere ripper hipper. A CO_2-charged system was used to propel the fumigant through flow regulators mounted on stainless steel delivery tubes attached to the trailing edge of forward-swept chisels. The fumigant was injected 16 inches deep 31 days before planting with one chisel per row. Rows were immediately hipped with disk hillers to seal and prevent rapid loss of the fumigant. All remaining rows were subsoiled 16 inches deep and hipped without applying the fumigant.

Cultivar: DP 444 BR

Experimental design: Randomized complete block with five replications

Plot design: Two-row plots; rows 40 feet long, 38 inches wide; blocks separated by a 20-foot alley

Application date:

May 7, 2004	Telone II injected in the appropriate plots
June 8, 2004	Temik 15G applied in-furrow
June 21, 2004	Orthene 75S applied to all treatments

Planting date: June 8, 2004

Seed rate: 200 seeds per row

Nematode sample date:
May 7, 2004
June 9, 2004
July 13, 2004
August 4, 2004
September 1, 2004
October 30, 2004

Harvest date: October 30, 2004

Results: See Table 26, Table 27, Table 28, Table 29, and Table 30

Table 26. Effect of STAN, Telone II, and Temik 15G on the population development of the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* /500 cc soil at 0-112 days after planting					Mean[3]
			0	34	56	84	143	
Control	—	—	255	206	5363 ab	5263 ab	8720	2964 ab
Cruiser 5FS + STAN	0.34 ga + 0.1 Mga/seed	Seed treatment	189	155	3251 ab	3251 ab	6760	2227 ab
Cruiser 5FS + STAN	0.34 ga + 0.15 Mga/seed	Seed treatment	155	189	4868 ab	4868 ab	5005	2242 ab
Cruiser 5FS + Telone II	0.34 ga + 3 gal	Seed treatment + inject preplant	172	189	4661 ab	4661 ab	6605	2652 ab
Cruiser 5FS + Telone II	0.34 ga + 5 gal	Seed treatment + inject preplant	103	172	3991 b	3991 b	6140	2104 ab
Cruiser 5FS + Telone II + STAN	0.34 ga + 3 gal + 0.15 Mga/seed	Seed treatment + inject preplant	138	172	2563 b	2563 b	5624	1949 b
Cruiser 5FS + Telone II + STAN	0.34 ga + 5 gal + 0.15 Mga/seed	Seed treatment + inject preplant	189	120	3904 ab	3904 ab	8927	2586 ab
Temik 15G	5 lb	In-furrow	120	86	6702 a	6072 a	8720	3136 a
LSD (P=0.05)			NS	NS	2932	2932	NS	1168

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test. Average reniform populations at the time of injection were 1427 reniform/500 cc soil.
[2]Rates calculated are based on 38-inch row spacing.
[3]Average reniform nematode population across all sample dates.

Table 27. Effect of STAN, Telone II, and Temik 15G on the plant height, number of nodes produced, and the first fruiting node of DP 444 BR cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method[3]	Plant height (in)	Nodes per plant	Node of first fruiting branch
Control	—	—	34.3 c	15.5 ab	6.5 b
Cruiser 5FS + STAN	0.34 ga + 0.12 Mga/seed	Seed treatment	35.6 bc	15.9 ab	5.9 c
Cruiser 5FS + STAN	0.34 ga + 0.15 Mga/seed	Seed treatment	37.9 abc	15.5 ab	6.4 b
Cruiser 5FS + Telone II	0.34 ga + 3 gal	Seed treatment + inject preplant	38.0 abc	15.5 ab	5.8 c
Cruiser 5FS + Telone II	0.34 ga + 5 gal	Seed treatment + inject preplant	35.7 bc	15.0 b	5.9 c
Cruiser 5FS + Telone II + STAN	0.34 ga + 3 gal + 0.15 Mga/seed	Seed treatment + inject preplant	40.6 a	16.7 a	6.9 a
Cruiser 5FS + Telone II + STAN	0.34 ga +5 gal + 0.15 Mga/seed	Seed treatment + inject preplant	39.8 ab	15.8 ab	6.3 b
Temik 15G	5 lb	In-furrow	35.2 c	14.7 b	5.7 c
LSD (P=0.05)			4.4	1.6	0.4

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.

Table 28. Effect of STAN, Telone II, and Temik 15G on the number of bolls produced at the 1st, 2nd, and 3rd fruiting positions on DP 444BR cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre	Application method	Open bolls[2]			Total open bolls per plant
			Position 1	Position 2	Position 3	
Control	—	—	5.5	2.2	0.0 b	7.6 b
Cruiser 5FS + STAN	0.34 ga + 0.12 Mga/seed	Seed treatment	6.3	2.2	0.5 ab	9.0 ab
Cruiser 5FS + STAN	0.34 ga + 0.15 Mga/seed	Seed treatment	6.2	2.8	0.1 b	9.1 ab
Cruiser 5FS + Telone II	0.34 ga + 3 gal	Seed treatment + inject preplant	5.9	2.5	0.2 b	8.5 ab
Cruiser 5FS + Telone II	0.34 ga + 5 gal	Seed treatment + inject preplant	5.7	2.9	0.4 ab	8.9 ab
Cruiser 5FS + Telone II + STAN	0.34 ga + 3 gal + 0.15 Mga/seed	Seed treatment + inject preplant	6.5	2.3	2.5 a	11.3 a
Cruiser 5FS + Telone II + STAN	0.34 ga + 5 gal + 0.15 Mga/seed	Seed treatment + inject preplant	5.7	2.5	0.0 b	8.2 ab
Temik 15G	5 lb	In-furrow	5.8	2.4	0.0 b	8.2 ab
LSD (P=0.05)			NS	NS	2.2	3.2

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Average number of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls at position 3 and above.

Table 29. Effect of STAN, Telone II, and Temik 15G on the weight of open bolls produced at the 1st, 2nd, and 3rd fruiting positions of DP 444 BR cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton weight (g)[3]			Total seed cotton weight per plant (g)
			Position 1	Position 2	Position 3	
Control	—	—	78.3 ab	27.3	0.0 b	105.6
Cruiser 5FS + STAN	0.34 ga + 0.12 Mga/seed	Seed treatment	82.6 ab	28.6	0.0 b	111.1
Cruiser 5FS + STAN	0.34 ga + 0.15 Mga/seed	Seed treatment	91.5 a	28.9	2.7 ab	123.1
Cruiser 5FS + Telone II	0.34 ga + 3 gal	Seed treatment + inject preplant	82.7 ab	29.1	1.8 ab	113.5
Cruiser 5FS + Telone II	0.34 ga + 5 gal	Seed treatment + inject preplant	73.1 b	36.7	1.1 ab	110.9
Cruiser 5FS + Telone II + STAN	0.34 ga + 3 gal + 0.15 Mga/seed	Seed treatment + inject preplant	88.7 a	24.2	4.8 a	117.7
Cruiser 5FS + Telone II + STAN	0.34 ga + 5 gal + 0.15 Mga/seed	Seed treatment + inject preplant	77.5 ab	40.2	0.0 b	117.7
Temik 15G	5 lb	In-furrow	83.9 a	26.9	0.0 b	110.7
LSD (P=0.05)			14.2	NS	3.7	NS

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of significance according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.
[3]Weight of cotton bolls produced per plant in each fruiting position. Position 3 includes the summation of all bolls position 3 and above.

Table 30. Effect of STAN, Telone II, and Temik 15G on the yield of DP 444 BR cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton	Seed cotton	Yield over control
			lb/plot	*lb/A*	*lb/A*
Control	—	—	14.5 b	2498 b	0.0
Cruiser 5FS + STAN	0.34 ga + 0.12 Mga/seed	Seed treatment	16.5 ab	2831 ab	333.2
Cruiser 5FS + STAN	0.34 ga + 0.15 Mga/seed	Seed treatment	15.8 ab	2708.4 ab	210.4
Cruiser 5FS + Telone II	0.34 ga + 3 gal	Seed treatment + inject preplant	18.8 a	3222.4 a	724.4
Cruiser 5FS + Telone II	0.34 ga + 5 gal	Seed treatment + inject preplant	17.5 ab	3000.4 ab	502.4
Cruiser 5FS + Telone II + STAN	0.34 ga + 3 gal + 0.15 Mga/seed	Seed treatment + inject preplant	16.6 ab	2852.6 ab	354.6
Cruiser 5FS + Telone II + STAN	0.34 ga + 5 gal + 0.15 Mga/seed	Seed treatment + inject preplant	17.5 ab	3011.4 ab	513.4
Temik 15G	5 lb	In-furrow	17.2 ab	2955.8 ab	457.8
LSD (P=0.05)			1.5	273.0	

[1]Data are means of five replications. Means within a column not followed by the same letter are significantly different at the 0.05 level of probability according to the least significant difference test.
[2]Rates calculated are based on 38-inch row spacing.

Appendix Table 1. List of chemicals used in the nematode management studies for 2004.				
Trade name	**Formulation**	**Company**	**Common name**	**Scientific description**
STAN	—	Syngenta	Abamectin	
Di-Syston	8EC	Bayer Corporation	Disulfoton	O, O-Diethyl S-[2-(ethylthio)ethyl] phosphordodithioate
Cruiser	5 FS	Syngenta	Thiamethoxam	
Telone II	—	Dow AgriSciences	—	1, 3-dichloropropene
Temik	15G	Rhone-Poulenc	Aldicarb	[2-methyl-2-(methylthio) propionaldehyde O-(methyl carbamoy)oxime]
Orthene	75S	Valent	Acephate	O, S-Dimethyl acetyl phosphoramidothioate
Vydate	C-LV	DuPont	Oxamyl	[Methyl N'N'-dimethyl-N-[(methyl carbamoy)oxy] -1-thioxamimidate]
Worm Tea	—	Church Hill Worm Farm	—	Leachates from Worm Castings
Visible	—	AgTime Company, Inc.	—	Secondary Alcohol ethoxylates
Jenner-8 Plus	—	The Catalyst Product Group	—	Carbon Rich, Liquid Humic/Fulvic Acid
Di-Syston	8EC	Bayer Corporation	Disulfoton	O, O-Diethyl S-[2-(ethylthio)ethyl] phosphordodithioate
Vapam	HL	AMVAC	—	Sodium methyl dithiocarbamate (anhydrous)
KC791230	—	Bayer	—	Unknown
Gaucho	600	Bayer	Imidacloprid	1-[(6-Chloro-3-pyridinyl) methyl]-N-nitro-2 -imidazdidinimine

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