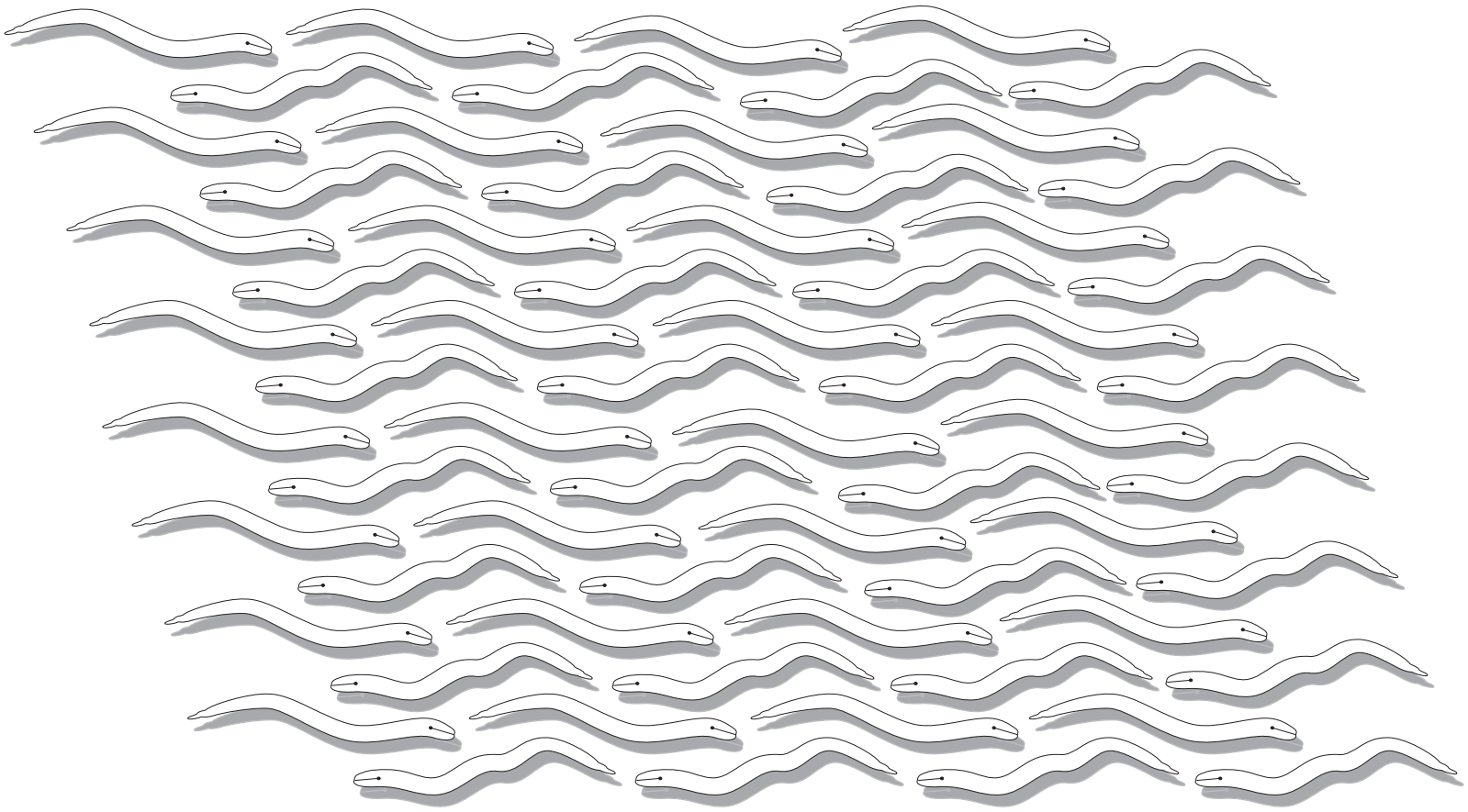
Bulletin 1110 **August 2001**

Nematode Management Investigations *in Mississippi, 1999*



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Nematode Management Investigations in Mississippi, 1999

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Appreciation is expressed to Andrew Diaz and Christi Eddlemon for their assistance in conducting these experiments. For more information, contact Gary Lawrence by telephone at (662) 325-2988 or by e-mail at glawrence@entomology.msstate.edu. This bulletin was published by the Office of Agricultural Communications, a unit of the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University.

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Nematode Management Investigations in Mississippi, 1999

INTRODUCTION

This summary of 1999 nematode management 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 carbon-dioxide-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.

Adage 5FS was added to the seed before planting at a rate of 200 grams of active ingredient per 100 kilograms of seed.

Variable-Rate Application Methods. Temik and Telone II variable-rate applications were based on nematode population levels and their distribution within the field. The distribution was determined by collecting nematode soil samples based on a 1-acre grid in the test location. Sample points were geo-referenced using Satloc GPS. For each field, a map depicting the range of nematode population densities was created using AgLink Professional software package. In the variable-rate studies, the conventional single-rate treatments were based on the average nematode populations across the field corresponding to a specific treatment. The variable-rate applications were based on nematode density maps created from half-acre subplots.

For the Telone II variable-rate test, the fumigant was injected using a 100-gallon supply tank affixed to a four-row subsoiler. Telone II was propelled using a single roller pump driven with an electrical motor system that would allow variable-rate applications. Variable-rate applications were controlled by the variable-rate software FieldLink, a Mid Tech TASC-2500 controller, and Satloc GPS. Telone II was delivered through stainless steel delivery tubes attached to the trailing edge of forward-swept parabolic subsoil chisels. The fumigant was injected 14 inches deep 18 days before planting with one chisel per row. Rows were immediately hipped with disk hillers to seal and prevent the rapid loss of the fumigant. In the Telone II test, Temik 15G was applied at planting with granular chemical applicators mounted on a commercial seed planter.

For the Temik 15G variable-rate test, the Temik was applied using a planter equipped with pesticide hopper boxes driven by an electrical motor system that would enable variable-rate applications. Variable-rate applications were controlled by the variable-rate software FieldLink, a Mid Tech TASC-2500 controller, and Satloc GPS. A Temik 15G sidedress treatment was applied 43 days after planting using a four-row hydraulic unit equipped with an electric motor and the same variable-rate equipment as on the seed planter.

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 Adage 5FS

Objective: Adage 5FS was examined in Glen Allan, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production location. Adage 5FS was compared with applications of Temik 15G at 3.5 and 5 pounds of formulated product per acre. Adage 5FS was also included in combination with foliar applications of Vydate C-LV at 8.5 ounces per acre. The insecticide Di-Syston 8EC was included as an insecticide-treated control. A control that did not receive an insecticide or nematicide was also included. All plots were treated with Orthene 75S at 4 ounces of formulated product per acre when thrips were detected in the untreated control 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: NuCotton 33B

Experimental design: Randomized complete block with five replications

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

Application date:

May 8, 1999	Adage 5FS-treated seed planted
	Temik 15G applied in-furrow
June 9, 1999	Orthene 75S applied to all treatments
	Vydate C-LV 6th to 7th true-leaf stage application
June 24, 1999	Vydate C-LV 15 days after 6th to 7th true-leaf stage application
	Orthene 75S applied to all treatments

Planting date: May 8, 1999

Seed rate: 210 seeds per row

Nematode sample date:
May 8, 1999
June 8, 1999
July 14, 1999
August 11, 1999
September 22, 1999

Stand counts: June 8, 1999

Plant heights:
July 14, 1999
September 12, 1999

Harvest date: September 12, 1999

Results: See Tables 1-7

Comments: Thrips counts were collected at a duplicate location that was established at Mississippi State University. Ratings were made on June 17, 1999, by a graduate research assistant. The variation recorded between the two Adage 5FS treatments cannot be explained. Unfortunately, this test was lost due to an overspray with herbicide.

Table 1. Effect of Adage 5FS on population development of reniform nematode on NuCotton 33B cotton.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* / 250 cm³ soil at 0-127 days after planting					
			0	31	67	95	127	Mean[3]
Temik 15G	3.5 lb	In-furrow	6,721 a	4,674 a	30,591 a	34,067 a	13,158 bc	17,842 a
Temik 15G	5 lb	In-furrow	6,721 a	4,751 a	27,347 a	26,420 a	16,107 ab	16,269 a
Adage 5FS	200 g a.i. per 100 kg seed	Seed treatment	6,644 a	4,519 a	24,102 a	25,029 a	17,471 ab	1,553 a
Adage 5FS + Vydate C-LV	200 g a.i. per 100 kg seed + 8.5 oz	Seed treatment + pin-head + 14 days	6,180 a	4,712 a	17,883 a	8,897 b	7,995 c	9,134 b
Di-Syston 8EC	1 lb a.i.	In-furrow	6,450 a	3,592 a	23,639 a	27,115 a	14,858 ab	15,131 a
Control	—	—	7,377 a	3,708 a	20,162 a	25,570 a	19,493 a	15,262 a
LSD (P=0.05)			4,482.8	1,814.1	12,744	12,588	5,988.7	4,541.9

[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]Rates calculated are based on 40-inch row spacing.
[3]Average reniform nematode population density across sample dates.

Table 2. Effect of Adage 5FS on plant survival and height of NuCotton 33B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seedling stand[3]	Seedling stand[4]	Plant height[5]	
					67 DAP	125 DAP
					in	*in*
Temik 15G	3.5 lb	In-furrow	200.0 ab	5.00 ab	26.74 a	28.33 a
Temik 15G	5 lb	In-furrow	209.6 a	5.24 a	27.28 a	27.03 ab
Adage 5FS	200 g a.i. per 100 kg seed	Seed treatment	199.2 ab	4.98 ab	25.76 a	23.47 ab
Adage 5FS + Vydate C-LV	200 g a.i. per 100 kg seed + 8.5 oz	Seed treatment + pin-head + 14 days	172.6 b	4.32 b	22.60 b	26.57 ab
Di-Syston 8EC	1 lb a.i.	In-furrow	186.4 ab	4.66 ab	26.26 a	25.67 ab
Control	—	—	191.2 ab	4.78 ab	21.98 b	22.53 b
LSD (P=0.05)			30.9	0.773	2.261	5.114

[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 40-inch row spacing.
[3]Number of live plants per 40 feet of row; all rows received 210 seeds.
[4]Number of live plants per foot of row.
[5]Plant height was measured on July 14 and September 12, 1999. DAP = Days After Planting.

Table 3. Effect of Adage 5FS on the number of nodes produced and first fruiting node on NuCotton 33B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Nodes per plant	Node of first fruiting branch
Temik 15G	3.5 lb	In-furrow	17.3 ab	6.4 a
Temik 15G	5 lb	In-furrow	17.0 ab	6.7 a
Adage 5FS	200 g a.i. per 100 kg seed	Seed treatment	15.8 b	6.5 a
Adage 5FS+ Vydate C-LV	200 g a.i. per 100 kg seed + 8.5 oz	Seed treatment + pin-head + 14 days	18.7 a	7.8 a
Di-Syston 8EC	1 lb a.i.	In-furrow	16.1 b	6.9 a
Control	—	—	18.5 a	8.1 a
LSD (P=0.05)			2.0	2.1

[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 significance according to the least significant difference test.
[2]Rates were calculated based on 40-inch row spacing.

Table 4. Effect of Adage 5FS on the numbers of bolls produced at the 1st, 2nd, and 3rd fruiting positions on NuCotton 33B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Open bolls[3] Position 1	Position 2	Position 3	Total open bolls per plant
Temik 15G	3.5 lb	In-furrow	3.7 ab	1.5 ab	0.4 ab	5.6 ab
Temik 15G	5 lb	In-furrow	3.6 abc	1.3 ab	0.1 b	5.1 b
Adage 5FS	200 g a.i. per 100 kg seed	Seed treatment	4.2 a	0.6 b	0.0 b	4.8 b
Adage 5FS + Vydate C-LV	200 g a.i. per 100 kg seed + 8.5 oz	Seed treatment + pin-head + 14 days	3.5 abc	1.3 ab	1.7 a	6.4 a
Di-Syston 8EC	1 lb a.i.	In-furrow	3.7 ab	1.9 a	0.0 b	5.0 b
Control	—	—	2.6 c	1.4 ab	0.7 ab	4.6 b
LSD (P=0.05)			1.1	1.3	1.3	1.3

[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 were calculated based on 40-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 5. Effect of Adage 5FS on the weight of open bolls produced at the 1st, 2nd, and 3rd fruiting positions on NuCotton 33B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton weight[3]			Total seed cotton weight per plant
			Position 1	Position 2	Position 3	
			g	*g*	*g*	*g*
Temik 15G	3.5 lb	In-furrow	12.17 a	4.22 ab	0.37 b	16.76 ab
Temik 15G	5 lb	In-furrow	11.97 a	4.09 ab	0.39 b	16.45 ab
Adage 5FS	200 g a.i. per 100 kg seed	Seed treatment	10.66 a	1.80 b	0.00 b	12.46 b
Adage 5FS+ Vydate C-LV	200 g a.i. per 100 kg seed + 8.5 oz	Seed treatment + pin-head + 14 days	10.71 a	3.59 ab	4.50 a	18.80 a
Di-Syston 8EC	1 lb a.i.	In-furrow	10.91 a	6.16 a	0.00 b	17.07 ab
Control	—	—	7.77 a	2.97 ab	1.38 ab	12.11 b
LSD (P=0.05)			4.72	3.70	3.23	6.06

[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 were calculated based on 40-inch row spacing.
[3]Average cotton weight (g) produced per plant in each fruiting position. Position 3 includes the summation of all cotton weight at position 3 and above.

Table 6. Effect of Adage 5FS on the yield of NuCotton 33B 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	—	—	6.53 b	1,066.8 b	—
Temik 15G	3.5 lb	In-furrow	11.62 a	1,899.7 a	832.9
Temik 15G	5 lb	In-furrow	10.57 a	1,728.9 a	662.1
Adage 5FS	200 g a.i. per 100 kg seed	Seed treatment	11.03 a	1,804.0 a	737.2
Adage 5FS+ Vydate C-LV	200 g a.i. per 100 kg seed + 8.5 oz	Seed treatment + pin-head + 14 days	9.66 a	1,579.5 a	512.7
Di-Syston 8EC	1 lb a.i.	In-furrow	9.71 a	1,587.7 a	520.9
LSD (P=0.05)			2.160	353.3	

[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 were calculated based on 40-inch row spacing.

Table 7. Effect of Adage 5FS on naturally occurring thrips populations on NuCotton 33B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Thrips rating[3]
Control	—	—	2.400 a
Temik 15G	3.5 lb	In-furrow	0.000 c
Temik 15G	5 lb	In-furrow	0.000 c
Adage 5FS	200 g a.i. per 100 kg seed	Seed treatment	0.000 c
Adage 5FS+ Vydate C-LV	200 g a.i. per 100 kg seed + 8.5 oz	Seed treatment + pin-head +14 days	2.600 a
Di-Syston 8EC	1 lb a.i.	In-furrow	0.800 b
LSD (P=0.05)			0.6418

[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 were calculated based on 40-inch row spacing.
[3]Thrips ratings occurred on June 17, 1999. A rating scale of 0 to 4 was used.

Reniform Nematode Management with Nemacur 240CS

Objective: Nemacur 240CS was examined on the Mississippi State University North Plant Science Research Farm in Starkville, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production location. Nemacur 240CS was applied as an in-furrow spray at 1 pound of active ingredient per acre at planting. Nemacur 240CS was also applied as a foliar application at 1.5 pounds of active ingredient per acre when the cotton plants had reached the 5th- to 7th-node developmental stage. Nemacur 240CS was compared with Temik 15G applied in-furrow at 5 pounds of product per acre and Vydate C-LV applied as a foliar spray at 8 ounces per acre at the 5th- to 7th-node developmental stage. An untreated control that received Di-Syston 8EC was also included. All plots were treated with Orthene 75S at 4 ounces of formulated product per acre when damage due to thrips infestation was detected.

Nemacur 240CS was applied in the seed furrow with a single flat fan 8003 nozzle positioned in front of the seed furrow closing disk. The Nemacur was propelled with a CO_2-charged system at 30 psi. Nemacur 240CS and Vydate C-LV as foliar sprays were applied through two 8003 flat fan nozzles spaced over each row at 30 psi. A total volume of 10 gallons per acre was applied for both in-furrow and foliar applications. Temik 15G was applied at planting with a Case 900 Early Riser planter equipped with granular chemical applicators.

Cultivar: BXN-47

Experimental design: Randomized complete block with five replications

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

Application date:

May 18, 1999	Nemacur 240CS in-furrow application
	Temik 15G in-furrow application
June 15, 1999	Orthene 75S applied to all treatments
July 13, 1999	Nemacur 240CS 5th- to 7th-node foliar application
	Vydate C-LV 5th- to 7th-node foliar application

Planting date: May 18, 1999

Seed rate: 210 seeds per row

Nematode sample date: May 18, 1999
July 29, 1999
November 11, 1999

Stand counts: June 21, 1999

Harvest date: October 5, 1999

Results: See Tables 8-10

Table 8. Effect of Nemacur 240CS on population development of the reniform nematode on BXN-47 cotton.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* / 250 cm³ soil at 0-178 days after planting			
			0	73	178	Mean[3]
Di-Syston 8EC	1 lb a.i.	In-furrow	5,291.6 a	12,746 a	10,429 a	9,489 a
Nemacur 240CS	1 lb a.i.	In-furrow	3,823.9 ab	9,270 a	9,656 ab	7,583 ab
Nemacur 240CS + Nemacur 240CS	1 lb a.i. + 1.5 lb a.i.	In-furrow + 5th - 7th true-leaf stage	4,184.4 ab	10,429 a	5,639 b	6,751 b
Temik 15G	5 lb	In-furrow	2,845.4 b	10,661 a	7,918 ab	7,141 b
Temik 15G + Nemacur 240CS	5 lb + 1.5 lb a.i.	In-furrow + 5th - 7th true-leaf stage	4,248.8 ab	14,600 a	6,991 ab	8,613 ab
Temik 15G+ Vydate C-LV	5 lb + 8 oz	In-furrow + 6th true-leaf stage	4,673.6 a	9,502 a	7,532 ab	7,236 ab
LSD (P=0.05)			1,773.7	5,559	4,761.9	2,303

[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 9. Effect of Nemacur 240CS on plant survival of BXN-47 cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seedling stand[3]	Seedling stand[4]
Di-Syston 8EC	1 lb a.i	In-furrow	158.00 a	3.95 a
Nemacur 240CS	1 lb a.i.	In-furrow	152.60 a	3.82 a
Nemacur 240CS + Nemacur 240CS	1 lb a.i. + 1.5 lb a.i.	In-furrow + 5th - 7th true-leaf stage	159.20 a	3.98 a
Temik 15G	5 lb	In-furrow	153.20 a	3.83 a
Temik 15G + Nemacur 240CS	5 lb + 1.5 lb a.i.	In-furrow + 5th - 7th true-leaf stage	166.60 a	4.17 a
Temik 15G + Vydate C-LV	5 lb + 8 oz	In-furrow + 6th true-leaf stage	166.40 a	4.16 a
LSD (P=0.05)			24.424	6.106

[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]Number of live plants per 40 feet of row; all rows received 210 seeds.
[4]Number of live plants per foot of row.

Table 10. Effect of Nemacur 240CS on the yield of BXN-47 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*
Di-Syston 8EC	1 lb a.i	In-furrow	5.57 b	955.6 b	—
Nemacur 240CS	1 lb a.i.	In-furrow	8.57 a	1,470.5 a	514.9
Nemacur 240CS + Nemacur 240CS	1 lb a.i. + 1.5 lb a.i.	In-furrow + 5th - 7th true-leaf stage	9.18 a	1,575.6 a	620.0
Temik 15G	5 lb	In-furrow	8.52 a	1,462.0 a	506.4
Temik 15G + Nemacur 240CS	5 lb + 1.5 lb a.i.	In-furrow + 5th - 7th true-leaf stage	9.14 a	1,568.2 a	612.6
Temik 15G + Vydate C-LV	5 lb + 8 oz	In-furrow + 6th true-leaf stage	8.28 a	1,421.1 a	465.5
LSD (P=0.05)			1.639	281.27	

[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]Foliar Nemacur applications were made at the 5th- to 7th-node growth stage on July 13, 1999.
[3]Rates were calculated based on 38-inch row spacing.

Root-Knot Nematode Management in Ultra-Narrow-Row Cotton with Telone II Soil Fumigant

Objective: Telone II was examined in Bartahatchie, Mississippi, for the management of the root-knot nematode (*Meloidogyne incognita*) in an established narrow-row cotton production location. Telone II was applied as a broadcast application at 3, 6, and 9 gallons per acre. A control that did not receive an insecticide or nematicide was also included.

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 14 inches deep 17 days before planting with chisels spaced 20 inches apart. The treated area was immediately disked to form a seal to prevent the rapid loss of the fumigant.

Cultivar: PayMaster 1218

Experimental design: Treatments were applied as strips across the field in a completely randomized design with five replications.

Plot design: Twenty-four plots; rows 40 feet long, 10 inches wide

Application date: April 29, 1999 Telone II injected

Planting date: May 16, 1999

Nematode sample date: May 17, 1999
June 17, 1999
September 30, 1999

Harvest date: September 30, 1999

Results: See Tables 11-12

Table 11. Effect of Telone II on population development of the root-knot nematode (*Meloidogyne incognita*) on ultra-narrow rows planted with PayMaster 1218 cotton.[1]

Treatment	Rate per acre[2]	Application method	*M. incognita* / 250 cm³ soil at 0-136 days after planting			
			0	31	136	Mean[3]
Telone II	3 gal/A	Injected 14 inches deep	51.50 a	38.63 b	576.2 a	222.1 a
Telone II	6 gal/A	Injected 14 inches deep	38.63 a	64.37 ab	1,814.6 a	639.2a
Telone II	9 gal/A	Injected 14 inches deep	38.63 a	25.75 b	903.0 a	318.2 a
Control	—	—	25.75 a	193.12 a	516.0a	249.3 a
LSD (P=0.05)			48.588	144.63	1,495	512.97

[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 were calculated on 38-inch row spacing.
[3]Average root-knot nematode population density across all sample dates.

Table 12. Effect of Telone II on yield of narrow-row PayMaster 1218 cotton planted in a field infested with the root-knot nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton yield	Yield over control
			lb/A	*lb/A*
Telone II	3 gal/A	Injected 14 inches deep	1,338.5 ab	163.6
Telone II	6 gal/A	Injected 14 inches deep	1,434.5 ab	259.6
Telone II	9 gal/A	Injected 14 inches deep	1,609.9 a	435.0
Control	—	—	1,174.9 b	—
LSD (P=0.05)			288.93	

[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 were calculated based on 38-inch row spacing.

Management of the Reniform Nematode with Telone II Soil Fumigant

Objective: Telone II was examined in Glen Allan, Mississippi, for the management of the reniform nematode (*Rotylenchulus reniformis*) in an established cotton production location. Telone II was applied at 1.5, 3, and 4.5 gallons per acre. Telone II was compared with at-planting applications of Temik 15G at 3.5 and 5 pounds per acre. A Temik 15G at-planting and sidedress combination (5 pounds + 5 pounds) treatment was also included. 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.

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 18 inches deep 26 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 18 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. Temik 15G was applied as a sidedress treatment 4 inches deep and approximately 10 inches away from each side of the plant with rolling coulters attached to a Temik applicator box.

Cultivar: Delta and Pine Land 20B

Experimental design: Randomized complete block with five replications

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

Application date:

April 14, 1999	Telone II injected
May 8, 1999	Temik 15G applied in-furrow
June 9, 1999	Orthene 75S applied to all treatments
June 23, 1999	Temik 15G sidedress application

Planting date: May 8, 1999

Seed rate: 210 seeds per row

Nematode sample date:
April 14, 1999
May 10, 1999
June 8, 1999
July 14, 1999
August 11, 1999
September 22, 1999

Stand counts: June 8, 1999

Plant height:
July 14, 1999
September 11, 1999

Harvest date: September 11, 1999

Results: See Tables 13-18

Table 13. Effect of Telone II on population development of the reniform nematode on Delta and Pine Land 20B cotton.[1]

Treatment[2]	Rate per acre[3]	Application method	*R. reniformis* / 250 cm³ soil at 0-136 days after planting						
			26 days preplant[4]	0	35	66	94	136	Mean[5]
Telone II	1.5 gal	Injected 14 in deep 3 weeks preplant	5,523 a	1,468 b	2,047 b	11,858 bc	17,150 abc	4,699 c	8,549 c
Telone II	3 gal	Injected 14 in deep 3 weeks preplant	4,828 a	1,082 b	2,034 b	7,030 cd	10,661 c	3,322 c	5,791 d
Telone II	4.5 gal	Injected 14 in deep 3 weeks preplant	6,219 a	1,004 b	2,820 ab	3,167 d	11,819 c	5,227 c	6,051 d
Temik 15G	3.5 lb	In-furrow	6,064 a	4,596 a	4,056 a	24,797 a	22,325 a	17,330 a	15,834 a
Temik 15G	5 lb	In-furrow	6,798 a	3,940 a	2,820 ab	16,029 b	16,223 abc	6,232 bc	10,408 bc
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress 6th true-leaf stage	6,489 a	4,210 a	2,897 ab	13,828 b	12,862 bc	9,849 b	10,027 c
Di-Syston 8EC (Control)	1 lb a.i.	In-furrow	4,905 a	4,635 a	2,395 b	25,029 a	19,815 ab	5,626 c	12,481 b
LSD (P=0.05)			2,114.1	1,970.7	1,358.6	5,413.4	7,163.8	3,844.4	2,203.1

[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 significance according to the least significant difference test.
[2]Temik 15G sidedress treatment was applied at 6th true-leaf stage on June 23, 1999.
[3]Rates were calculated based on 40-inch row spacing.
[4]Soil samples for nematode counts were collected before injection of Telone II on this date.
[5]Average of all sample dates.

Table 14. Effect of Telone II on plant survival and height of Delta and Pine Land 20B cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application method	Seedling stand[4]		Plant height[5]	
			Per row	Per row foot	36 DAP	125 DAP
					in	*in*
Telone II	1.5 gal	Injected 14 in deep 3 weeks preplant	150.8 d	3.77 d	34.3 c	36.47 b
Telone II	3 gal	Injected 14 in deep 3 weeks preplant	154.4 cd	3.86 cd	36.3 b	40.90 a
Telone II	4.5 gal	Injected 14 in deep 3 weeks preplant	157.2 cd	3.93 cd	38.4 a	42.13 a
Temik 15G	5 lb	In-furrow	170.0 a	4.25 a	30.4 d	30.60 c
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress 6th true-leaf stage	165.8 ab	4.15 ab	29.6 d	30.60 c
Temik 15G	3.5 lb	In-furrow	161.2 bc	4.03 bc	27.2 e	26.57 c
Di-Syston 8EC (Control)	1 lb a.i.	In-furrow	124.6 c	3.12 c	27.2 e	27.43 c
LSD (P=0.05)			7.17	0.19	1.47	4.05

[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]Temik 15G sidedress treatment was applied at the 6th true-leaf stage on June 23, 1999.
[3]Rates calculated are based on 40-inch row spacing.
[4]Number of live plants per 40 feet of row; all rows received 210 seeds.
[5]Plant height recorded on July 14, 1999, and September 11, 1999. DAP = Days After Planting.

Table 15. Effect of Telone II on the number of nodes produced and first fruiting node on Delta and Pine Land 20B cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application method	Nodes per plant	Node of first fruiting branch
Telone II	1.5 gal	Injected 14 in deep 3 weeks preplant	17.90 abc	4.90 b
Telone II	3 gal	Injected 14 in deep 3 weeks preplant	19.90 a	5.67 ab
Telone II	4.5 gal	Injected 14 in deep 3 weeks preplant	19.33 ab	6.13 a
Temik 15G	5 lb	In-furrow	17.23 bc	5.57 ab
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress 6th true-leaf stage	16.43 c	5.33 ab
Temik 15G	3.5 lb	In-furrow	17.90 abc	6.23 a
Di-Syston 8EC (Control)	1 lb a.i.	In-furrow	17.67 bc	5.87 ab
LSD (P=0.05)			2.10	1.07

[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]Temik 15G sidedress treatment was applied at 6th true-leaf stage on June 23, 1999.
[3]Rates were calculated based on 40-inch row spacing.

Table 16. Effect of Telone on the numbers of bolls produced at the 1st, 2nd, and 3rd fruiting positions on Delta and Pine Land 20B cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application method	Open bolls[4]			Total open bolls per plant
			Position 1	Position 2	Position 3	
Telone II	1.5 gal	Injected 14 in deep 3 weeks preplant	7.3 abc	2.9 a	1.2 a	11.4 a
Telone II	3 gal	Injected 14 in deep 3 weeks preplant	8.9 a	1.7 abc	0.1 b	10.7 ab
Telone II	4.5 gal	Injected 14 in deep 3 weeks preplant	7.9 ab	2.3 ab	0.1 b	10.3 abc
Temik 15G	3.5 lb	In-furrow	5.4 bc	1.1 abc	0.0 b	6.6 cd
Temik 15G	5 lb	In-furrow	5.8 bc	0.4 c	0.1 b	6.3 d
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress 6th true-leaf stage	7.3 abc	2.9 a	0.2 b	10.4 ab
Di-Syston 8EC (Control)	1 lb a.i.	In-furrow	5.2 c	1.0 bc	0.1 b	6.3 d
LSD (P=0.05)			2.5	1.9	0.7	3.8

[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]Temik 15G sidedress treatment was applied at 6th true-leaf stage on June 23, 1999.
[3]Rates were calculated based on 40-inch row spacing.
[4]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 17. Effect of Telone II on the weight of open bolls produced at the 1st, 2nd, and 3rd fruiting positions on Delta and Pine Land 20B cotton in a field infested with the reniform nematode.[1]

Treatment[2]	Rate per acre[3]	Application method	Seed cotton weight[4]			Total seed cotton weight per plant
			Position 1	Position 2	Position 3	
			g	*g*	*g*	*g*
Telone II	1.5 gal	Injected 14 in deep 3 weeks preplant	31.59 a	8.89 a	4.46 a	44.93 a
Telone II	3 gal	Injected 14 in deep 3 weeks preplant	34.20 a	4.30 abc	0.46 b	38.96 a
Telone II	4.5 gal	Injected 14 in deep 3 weeks preplant	29.39 ab	7.18 ab	0.52 b	37.09 ab
Temik 15G	3.5 lb	In-furrow	18.75 d	2.72 bc	0.00 b	21.48 c
Temik 15G	5 lb	In-furrow	20.68 bcd	1.14 c	0.36 b	22.18 bc
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress 6th true-leaf stage	29.11 abc	6.83 abc	0.61 b	36.55 ab
Di-Syston 8EC (Control)	1 lb a.i.	In-furrow	19.39 cd	2.67 bc	0.32 b	22.38 bc
LSD (P=0.05)			9.86	5.91	2.49	14.98

[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]Temik 15G sidedress treatment was applied at 6th true-leaf stage on June 23, 1999.
[3]Rates were calculated based on 40-inch row spacing.
[4]Average cotton weight (g) produced per plant in each fruiting position. Position 3 includes the summation of all cotton weights at position 3 and above.

Table 18. Effect of Telone II on the yield of Delta and Pine Land 20B 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*
Telone II	1.5 gal	Injected 14 in deep 3 weeks preplant	14.70 a	2,409.6 a	989.9
Telone II	3 gal	Injected 14 in deep 3 weeks preplant	13.50 ab	2,206.4 ab	786.7
Telone II	4.5 gal	Injected 14 in deep 3 weeks preplant	15.00 a	2,460.2 a	1,040.5
Temik 15G	3.5 lb	In-furrow	3.99 bc	1,727.2 bc	307.5
Temik 15G	5 lb	In-furrow	11.30 bc	1,846.8 bc	427.1
Temik 15G + Temik 15G	5 lb + 5 lb	In-furrow + sidedress 6th true-leaf stage	11.60 bc	1,895.8 bc	476.1
Di-Syston 8EC (Control)	1 lb a.i.	In-furrow	8.70 c	1,419.7 c	—
LSD (P=0.05)			3.100	512.5	

[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 significance according to the least significant difference test.
[2]Temik 15G sidedress treatment was applied at 6th true-leaf stage on June 23, 1999.
[3]Rates were calculated based on 40-inch row spacing.

Root-Knot Nematode Management using Variable-Rate Applications of Telone II Soil Fumigant

Objective: Telone II was examined in Cruger, Mississippi, for the management of the root-knot nematode (*Meloidogyne incognita*) in an established cotton production location. Variable-rate, site-specific applications of Telone II were compared with conventional one-rate uniform applications. Telone II was injected at 1.5, 3, and 4.5 gallons per acre. A variable-rate application that ranged from 1.5 to 4.5 gallons per acre was also included.

Telone II applications were based on nematode population levels and their distribution within the field. The distribution was determined by collecting nematode soil samples based on a 1-acre grid in the test location. Sample points were geo-referenced using Satloc GPS. A field map depicting the range of nematode population densities was created using AgLink Professional software package. Telone II was injected 14 inches deep as a conventional single-rate treatment or as a variable-rate treatment. The conventional single-rate treatments were based on the average nematode populations across the field corresponding to a specific treatment. The variable-rate applications were based on nematode density maps created from half-acre subplots. Telone II was injected using a 100-gallon supply tank affixed to a four-row subsoiler. Telone II was propelled using a single roller pump driven with an electrical motor system that would allow variable-rate applications. Variable-rate applications were controlled by the variable-rate software FieldLink, a Mid Tech TASC-2500 controller, and Satloc GPS. Telone II was delivered through stainless steel delivery tubes attached to the trailing edge of forward-swept parabolic subsoil chisels. The fumigant was injected 14 inches deep 18 days before planting with one chisel per row. Rows were immediately hipped with disk hillers to seal and prevent the rapid loss of the fumigant. Temik 15G was applied at planting with granular chemical applicators mounted on a commercial seed planter.

Cultivar: Delta and Pine Land 20B

Experimental design: Four-row plots were extended across the field. Treatments were randomized across the field and replicated four times.

Plot design: Four-row plots; rows 40 inches wide

Application date:
April 12, 1999 Telone II injected
April 30, 1999 Temik 15G applied to all plots

Planting date: April 30, 1999

Seed rate: Four seeds per linear row foot

Nematode sample date: March 12, 1999

Stand counts: May 28, 1999

Plant height: July 27, 1999

Harvest date: September 21, 1999

Results: See Tables 19-20

Comments: The variable-rate application was not applied due to a faulty docking station between the GPS unit and the MidTech controller. Yield data between the Telone II treatments and Temik 15G-alone treatments are not indicative of the actual benefits from applications of Telone II. Temik 15G was applied at the nematicidal rate of 5 pounds of formulated product per acre rather than the insecticidal rate of 3.5 pounds per acre. Final nematode populations were not collected due to GPS equipment failure of the system on loan from the Georgia Agricultural Experiment Station. The use license had expired and was not renewed. A second borrowed system from Mississippi State University was not compatible with the previously existing software. At the test location, reference sample points could not be determined using the MSU system. The test site was subsequently land formed; therefore, nematode samples could not be collected.

Table 19. Effect of Telone II on plant survival and height of cotton in a root-knot-nematode-infested field.[1]

Treatment	Rate per acre[2]	Application method	Seedling stand[3]	Plant height[4]
				in
Telone II	1.5 gal	Injected 14 in deep 18 days preplant	140.5 a	48.9 a
Telone II	3 gal	Injected 14 in deep 18 days preplant	127.3 a	48.8 a
Telone II	4.5 gal	Injected 14 in deep 18 days preplant	143.8 a	49.8 a
Telone II	1.5 - 4.5 gal variable rate (not applied)	Injected 14 in deep 18 days preplant	144.5 a	44.7 b
Temik 15G	5 lb	In-furrow	119.5 a	43.6 b
Temik 15G	3.5 lb	In-furrow	141.8 a	46.9 a
LSD (P=0.05)			27.7	2.1

[1]Data are means of four 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 were calculated based on 40-inch row spacing.
[3]Number of live plants per 40 feet of row.
[4]Plant height was recorded on July 27, 1999.

Table 20. Effect of Telone II on the yield of cotton grown in a field infested with the root-knot nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton yield	Yield over control
			lb/A	*lb/A*
Telone II + Temik 15G	3 gal + 5 lb	Injected 14 in deep 18 days preplant	3,448.91 bc	24.12
Telone II + Temik 15G	1.5 gal + 5 lb	Injected 14 in deep 18 days preplant	3,382.50 d	- 42.29
Telone II + Temik 15G	4.5 gal + 5 lb	Injected 14 in deep 18 days preplant	3,465.94 abc	41.15
Telone II + Temik 15G	1.5 - 4.5 gal variable rate (not applied) + 5 lb	Injected 14 in deep 18 days preplant	3,493.16 ab	68.37
Temik 15G	5 lb	In-furrow at plant	3,517.86 a	93.07
Temik 15G	3.5 lb	In-furrow at plant	3,424.79 cd	—
LSD (P=0.05)			64.926	

[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 were calculated based on 40-inch row spacing.

Reniform Nematode Management with Temik 15G

Objective: Temik 15G was 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 at the formulated rates of 3.5, 5, and 7 pounds per acre. Temik 15G was applied at planting with a Case 900 Early Riser planter equipped with granular chemical applicators. Di-Syston 8EC was included as an insecticide-treated control. A control that did not receive an insecticide or nematicide was also included. All plots were treated with Orthene 75S at 4 ounces of formulated product per acre when thrips were detected in the untreated control plots.

Cultivar: Delta and Pine Land 20B

Experimental design: Randomized complete block with five replications

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

Application date:

May 8, 1999	Temik 15G applied in-furrow
June 9, 1999	Orthene 75S applied to all treatments

Planting date: May 8, 1999

Seed rate: 210 seeds per row

Nematode sample date:
May 8, 1999
June 8, 1999
July 14, 1999
August 11, 1999
September 22, 1999

Stand counts: June 8, 1999

Plant height: September 22, 1999

Harvest date: September 22, 1999

Results: See Tables 21-26

Table 21. Effect of Temik 15G on population development of the reniform nematode on DPL-20B cotton.[1]

Treatment	Rate per acre[2]	Application method	*R. reniformis* / 250 cc soil at 0-137 days after planting					
			0	31	74	95	137	Mean[3]
Temik 15G	3.5 lb	In-furrow	6,064 ab	3,322 b	35,690 ab	26,883 a	18,308 a	18,053 a
Temik 15G	5 lb	In-furrow	4,481 b	3,360 b	29,201 ab	19,931 ab	19,699 a	15,334 ab
Temik 15G	7 lb	In-furrow	5,717 ab	4,558 ab	28,621 ab	22,480 a	25,261 a	17,327 a
Di-Syston 8EC	1 lb a.i.	In-furrow	5,678 ab	4,365 b	39,398 a	13,673 bc	21,553 a	16,933 ab
Control	—	—	7,493 a	6,489 a	20,549 b	7,648 c	23,175 a	13,071 b
LSD (P=0.05)			2,145.2	1,991.2	16,448	8,201	9,518.8	4,151.9

[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]Rates calculated are based on 40-inch row spacing.
[3]Average reniform nematode population density across all sample dates.

Table 22. Effect of Temik 15G on plant survival and height of DPL-20B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seedling stand[3]	Seedling stand[4]	Plant height[5]
					in
Temik 15G	3.5 lb	In-furrow	173.2 a	4.3 a	30.6 a
Temik 15G	5 lb	In-furrow	159.6 ab	3.9 ab	30.6 a
Temik 15G	7 lb	In-furrow	157.2 abc	3.9 abc	26.6 b
Di-Syston 8EC	1 lb a.i.	In-furrow	131.2 c	3.2 c	27.4 ab
Control	—	—	146.4 bc	3.6 bc	28.5 ab
LSD (P=0.05)			26.73	0.67	3.87

[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 40-inch row spacing.
[3]Number of live plants per 40 feet of row; all rows received 210 seeds.
[4]Number of live plants per row foot.
[5]Plant height was recorded on September 22, 1999.

Table 23. Effect of Temik 15G on the number of nodes produced and first fruiting node on DPL-20B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Nodes per plant	Node of first fruiting branch
Temik 15G	3.5 lb	In-furrow	17.90 a	6.23 a
Temik 15G	5 lb	In-furrow	17.23 a	5.57 a
Temik 15G	7 lb	In-furrow	16.90 a	5.43 a
Di-Syston 8EC	1 lb a.i.	In-furrow	17.67 a	5.87 a
LSD (P=0.05)			2.800	0.875

[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 were calculated based on 40-inch row spacing.

Table 24. Effect of Temik on the numbers of bolls produced at the 1st, 2nd, and 3rd fruiting positions on DPL-20B 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	
Temik 15G	3.5 lb	In-furrow	5.4 a	1.1 a	0.0 a	6.6 a
Temik 15G	5 lb	In-furrow	5.8 a	0.4 a	0.1 a	6.3 a
Temik 15G	7 lb	In-furrow	6.0 a	1.3 a	0.0 a	7.3 a
Di-Syston 8EC	1 lb a.i.	In-furrow	5.2 a	1.0 a	0.1 a	6.3 a
LSD (P=0.05)			2.83	1.39	0.26	3.54

[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 were calculated based on 40-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 25. Effect of Temik 15G on the weight of open bolls produced at the 1st, 2nd, and 3rd fruiting positions on DPL-20B cotton in a field infested with the reniform nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton weight[3]			Total seed cotton weight per plant
			Position 1	Position 2	Position 3	
			g	*g*	*g*	*g*
Temik 15G	3.5 lb	In-furrow	18.75 a	2.72 a	0.00 a	21.48 a
Temik 15G	5 lb	In-furrow	20.68 a	1.14 a	0.36 a	22.18 a
Temik 15G	7 lb	In-furrow	20.00 a	3.89 a	0.00 a	23.89 a
Di-Syston 8EC	1 lb a.i.	In-furrow	19.39 a	2.67 a	0.32 a	22.38 a
LSD (P=0.05)			10.063	5.205	0.899	13.021

[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 were calculated based on 40-inch row spacing.
[3]Average cotton weight (g) produced per plant in each fruiting position. Position 3 includes the summation of all cotton weights at position 3 and above.

Table 26. Effect of Temik 15G on the yield of DPL-20B 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*
Temik 15G	3.5 lb	In-furrow	11.34 a	1,853.7 a	765.3
Temik 15G	5 lb	In-furrow	10.68 a	1,746.9 a	658.5
Temik 15G	7 lb	In-furrow	11.36 a	1,857.3 a	768.9
Di-Syston 8EC	1 lb a.i.	In-furrow	10.12 a	1,654.3 a	565.9
Control	—	—	6.66 b	1,088.4 b	—
LSD (P=0.05)			2.639	431.52	

[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 were calculated based on 40-inch row spacing.

Variable-Rate Applications of Temik 15G for the Management of the Root-Knot Nematode

Objective: Temik 15G was examined in Cruger, Mississippi, for the management of the root-knot nematode (*Meloidogyne incognita*) in an established cotton production location. Variable-rate, site-specific applications of Temik 15G were compared with conventional one-rate uniform applications. Temik 15G was applied at 3.5 and 5 pounds per acre and a variable rate ranging from 3.5 to 7 pounds per acre of the product in the seed furrow at planting. Temik 15G was also used as a sidedress treatment at the conventional single rate of 5 pounds per acre and as a variable rate ranging from 3.5 to 7 pounds of product per acre.

Temik 15G applications were based on nematode population levels and distribution in the field. The distribution was determined by collecting nematode soil samples based on a 1-acre grid in the test location. Sample points were geo-referenced using Satloc GPS. A field map depicting the range of nematode population densities was created using AgLink Professional software package. Temik 15G was applied in-furrow as a conventional single-rate treatment or as a variable-rate treatment. The conventional single-rate treatments were based on the average nematode populations across the field corresponding to a specific treatment. The variable-rate applications were based on nematode density maps created from half-acre subplots. Temik 15G was applied using a planter equipped with pesticide hopper boxes driven by an electrical motor system that enabled variable-rate applications. Variable-rate applications were controlled by the variable-rate software FieldLink, a Mid Tech TASC-2500 controller, and Satloc GPS. A Temik 15G sidedress treatment was applied 43 days after planting using a four-row hydraulic unit equipped with an electric motor and the same variable-rate equipment as was on the seed planter.

Cultivar: Delta and Pine Land 20B

Experimental design: Four-row plots were extended across the field and replicated four times in a randomized complete block design.

Plot design: Four-row plots; rows 40 inches wide

Application date:
April 30, 1999 Temik 15G in-furrow treatments
June 10, 1999 Temik 15G sidedress treatments

Planting date: April 30, 1999

Seed rate: 4 seeds per linear row foot

Nematode sample date: March 12, 1999

Stand counts: May 28, 1999

Plant height: July 27, 1999

Harvest date: September 21, 1999

Results: See Tables 27-29

Comments: Final nematode populations were not collected due to GPS equipment failure of the system on loan from the Georgia Agricultural Experiment Station. The use license had expired and was not renewed. A second borrowed system from Mississippi State University was not compatible with the previously existing software. At the test location, reference sample points could not be determined using the MSU system. The test site was subsequently land formed; therefore, nematode samples could not be collected.

Table 27. Effect of Temik 15G on plant survival and height of cotton in a root-knot-nematode-infested field.[1]

Treatment	Rate per acre[2]	Application method	Seedling stand[3]	Plant height[4]
				in
Temik 15G	3.5 lb	In-furrow	141.8 a	46.9 a
Temik 15G	3.5 to 7 lb	In-furrow variable	123.8 a	48.6 a
Temik 15 G + Temik 15 G	5 lb + 5 lb	In-furrow + sidedress	139.0 a	49.9 a
Temik 15G	5 lb	In-furrow	142.8 a	47.2 a
Temik 15 G + Temik 15G	5 lb + 3.5 to 7 lb	In-furrow + sidedress variable	126.8 a	48.5 a
Temik 15G + Temik 15G	3.5 to 7 lb + 3.5 to 7 lb	In-furrow variable + sidedress variable	128.8 a	49.6 a
LSD (P=0.05)			25.9	4.4

[1]Data are means of four 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 were calculated based on 40-inch row spacing.
[3]Number of live plants per 40 feet of row.
[4]Plant height was recorded on July 27, 1999.

Table 28. Effect of variable-rate applications of Temik on the yield of cotton grown in a field infested with the root-knot nematode.[1]

Treatment	Rate per acre[2]	Application method	Seed cotton yield
			lb/A
Temik 15G	3.5 lb	In-furrow	3,424.79 c
Temik 15G	3.5 to 7 lb	In-furrow variable	3,330.49 d
Temik 15 G + Temik 15 G	5 lb + 5 lb	In-furrow + sidedress	3,568.88 ab
Temik 15G	5 lb	In-furrow	3,545.92 ab
Temik 15 G + Temik 15G	5 lb + 3.5 to 7 lb	In-furrow + sidedress variable	3,541.38 b
Temik 15G + Temik 15G	3.5 to 7 lb + 3.5 to 7 lb	In-furrow variable + sidedress variable	3,617.34 a
LSD (P=0.05)			75.39

[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 were calculated based on 40-inch row spacing.

Table 29. Economic analysis of variable-rate application of Temik 15G for the management of the root-knot nematode in Cruger, Mississippi, in 1999.[1]

Treatment	Rate per acre[2]	Application method	Lint yield	Cost per acre[3]	Gross return	Net return
			lb/A	*$*	*$*	*$*
Temik 15G	3.5 lb	In-furrow	1,301.42 c	11.20	780.85	769.65
Temik 15G	3.5 to 7 lb	In-furrow variable	1,265.59 d	31.52	759.35	727.83
Temik 15 G + Temik 15 G	5 lb + 5 lb	In-furrow + sidedress	1,356.17 ab	32.00	813.70	781.70
Temik 15G	5 lb	In-furrow	1,347.45 ab	16.00	808.47	792.47
Temik 15 G + Temik 15G	5 lb + 3.5 to 7 lb	In-furrow + sidedress variable	1,345.72 b	31.61	807.43	775.83
Temik 15G + Temik 15G	3.5 to 7 lb + 3.5 to 7 lb	In-furrow variable + sidedress variable	1,374.59 a	31.25	824.75	793.50
LSD (P=0.05)						

[1]Data are means of four 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 were calculated based on 40-inch row spacing.
[3]Economics are based only on the cost of Temik 15G at $3.20 per pound. Other application costs are not included. Price used for cotton is 60 cents per pound.

PROGRAM SUPPORT

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APPENDIX

Appendix Table 1. List of chemicals used in the nematode management studies for 1999.

Trade name	Formulation	Company	Common name	Scientific description
Adage	5FS	Syngent	—	Not reported
Di-Syston	8EC	Bayer Corporation	Disulfoton	*O,O*-Diethyl *S*-[2-(ethylthio)ethyl] phosphorodithioate
Nemacur	240CS	Bayer Corporation	—	Ethyl 3-methyl-4-(methylthio)phenyl(1-methylethyl) phosphoramidate
Telone II	—	Dow AgriSciences	—	1,3-dichloropropene
Temik	15G	Rhone-Poulenc	Aldicarb	[2-methyl-2-(methylthio) propionaldehyde O-(methyl carbamoyl)oxime]

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