

**EFFECT OF TELONE II ON RENIFORM  
NEMATODE MANAGEMENT IN MISSISSIPPI**

**G. W. Lawrence**

**Associate Professor**

**Department of Entomology & Plant Pathology**

**Mississippi State University**

**Mississippi State, MS**

**K. S. McLean**

**Assistant Professor**

**Department of Entomology & Plant Pathology**

**Auburn University**

**Auburn, AL**

**Abstract**

A test was conducted in 1999 to examine the benefits of including Telone II for the management of the reniform nematode (*Rotylenchulus reniformis*). The test was located in Glen Allan, Mississippi in an established cotton production location. Reniform nematode population development was followed by sampling monthly. Treatments included Telone II applied at 1.5, 3.0 and 4.5 gallons per acre injected per plant. Temik 15G was applied at 3.5 and 5.0 lb per acre in the seed furrow at planting and as a 5.0 lb per acre side-dress at 46 days after planting. Telone II significantly reduced reniform nematode populations during the growing season. Cotton plants in the Telone II treated plots were taller, had more open bolls and a greater plant weight than the Temik 15G treated plants and the untreated control. Seed cotton yields were significantly greater with the inclusion of Telone II for reniform nematode management.

**Introduction**

The reniform nematode (*Rotylenchulus reniformis*) is the most serious pest to cotton production in Mississippi. The reniform has been identified in 51 Mississippi counties infesting over 382,320 cotton producing acres. In 1999 yield losses were estimated to be as high as 6.6% valued at 33 million dollars lost to this nematode.

Nematode management techniques that are available to Mississippi cotton producers are limited. Without cotton varieties with resistance to the reniform nematode most producers must rely on the use of crop rotation with non-host plants or nematicides. Nematicides are currently the most widely used method for nematode management in Mississippi. Although this is a short term nematode management practice nematode populations are lower when nematicides are used and cotton yields are improved. Telone II is a nematicide that is increasing in use in Mississippi for nematode management. Telone II is a soil fumigant that has

been shown to significantly reduce nematode numbers and improve yields. The purpose of this test was to examine the benefits of including Telone II for reniform nematode management in Mississippi cotton production.

**Materials and Methods**

A test was conducted in 1999 to examine the effects of the reniform nematode (*Rotylenchulus reniformis*) on cotton growth and subsequent yield. The experiment was conducted in a field that was naturally infested with the reniform nematode in Washington county, Mississippi. An average population density of 5,832 reniform nematodes per 250 cm<sup>3</sup> were recovered from the plots at the start of the test. Telone II was applied 21 days prior to planting at 1.5, 3.0 and 4.5 gallons per acre. Telone II was injected with a modified John Deere ripper hipper. A CO<sub>2</sub> 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 with one chisel per row. Rows were immediately hipped with disc hillers to seal and prevent rapid loss of the fumigant. All remaining rows were sub-soiled and hipped without applying the fumigant. Temik 15G was applied at planting with a Case 900 Early Riser Planter equipped with a granular chemical applicators. Temik 15G was applied in the seed furrow at 5.0 and 7.0 lb per acre and as a side-dress treatment at 5.0 lb per acre with a Temik 15G applicator. Di-Syston 8EC was included for early season insect control in the untreated controls.

The experimental design was a randomized complete block with five replications. Plots consisted of four rows 40-foot long with a 38-inch row spacing. Replications were separated by a 20-foot border. Each row was planted with 210 Delta and Pine Land 20 B seed. Cotton seeds were commercially treated with Captan and Vitavax plus Apron by the manufacture. All plots were maintained with standard production practices recommended by the Mississippi Cooperative Extension Service commonly used in the area.

Nematode population development was determined at planting and at monthly intervals. Ten soil cores, 1-inch diameter and 8-inches deep were collected from the two center rows of each plot in a randomized systematic sampling pattern. Nematodes were extracted using a combination of gravity screening and sucrose centrifugation. Cotton plant growth and yield was determined at harvest by mapping plant from 3 feet of row. Plant height, boll number and boll weights were recorded at harvest. Plots were hand harvested 136 days after planting and yield recorded as seed cotton per acre.

## Results and Discussion

Telone II was examined in Washington county, Mississippi for the management of the reniform nematode and subsequent effects on cotton yields. Nematode numbers at the beginning of the test averaged 5,832 reniform per 250 cm<sup>3</sup> of soil on 14 April when Telone II was injected. Twenty-one days later, at planting reniform nematode numbers were significantly lower in the Telone II treatment compared with the other treatments (Table 1). Reniform nematode numbers remained lower in the Telone II treated plots for the remainder of the growing season and at harvest. Reniform nematode numbers averaged across the growing season were significantly lower in the Telone II treated plots compared with the other treatments.

Cotton plant growth was also affected by pre-plant applications of Telone II. Plants growing in the Telone II treated plots were taller and appeared to have a more vigorous growth compared to plants in the other treatments. Cotton plants averaged 12.4 inches taller in the Telone II treated plots compared with the control (Table 2). At harvest, more open bolls were produced per plant in all Telone II treatments and the Temik 15G side-dress treatment compared with the other Temik 15G treatments and the untreated control. Cotton plants averaged 10.8 and 10.4 bolls per plant in the Telone II and Temik 15G side-dress treatments, respectively (Table 2). Total boll weights were also significantly greater in the Telone II and Temik 15G side-dress treatments. Boll weights averaged 40.3 and 36.6 grams per plant in the Telone II and Temik 15G side-dress treatments, respectively (Table 2).

The highest seed cotton yields were recovered in the Telone II treated plots. Telone II significantly improved seed cotton yields compared with the control plots. Yields averaged 2,358.67 lbs of seed cotton per acre with Telone II compared with 1,420 lbs in the control (Table 2). The yields from the Temik 15G side-dress (5.0 lbs + 5.0 lbs) and Temik 15G 5.0 alone treatments were comparable with 1,896 and 1,847 lbs of seed cotton per acre.

In comparing the direct cost of the nematicides, cost varied from a high of \$54 per acre (Telone II 4.5 gal/acre) to a low of \$11.20 ( Temik 15G 3.5 lb/acre). In comparing the additional revenue and cost of the different materials Telone II 1.5 gal/acre yielded the greatest net return per acre (\$207.70 = 225.70 - 18.00). The net returns for all nematicide applications were positive , however, due to differences in costs and yields the net returns in the other treatments were lower ( Table 3).

### Disclaimer

The interpretation of data presented may change with additional experimentation. Information is not to be

construed as a recommendation for use or as an endorsement of a specific product over a similar product by Mississippi State University or the Mississippi Agricultural and Forestry Experiment Station.

Table 1. Effect of Telone II on reniform nematode population development.

Treatment	Days after planting				
	0	35	66	94	136
Telone II 1.5 gal	1468	2047	11858	17150	4699
Telone II 3.0 gal	1082	2034	7030	10661	3322
Telone II 4.5 gal	1004	2820	3167	11819	5227
Temik 5.0 lb	3940	2820	16029	16223	6230
Temik 5.0+5.0 lb	4210	2897	13828	12862	9849
Temik 3.5 lb	4596	4056	24797	22325	17330
Control	4635	2395	25029	19815	5626

Table 2. Effect of Telone II on the production of Delta and Pine Land 20B in a reniform nematode infested field

Treatment rate/acre	Average Rr/ 250cm <sup>3</sup>	Plant height (in)	Open bolls	Boll wt (g)	Seed cotton yield (lb/a)
Telone II 1.5 gal	8,549	36.5	11.4	44.9	2,409.6
Telone II 3.0 gal	5,791	40.9	10.7	39.0	2,206.4
Telone II 4.5 gal	6,051	42.1	10.3	37.1	2,460.2
Temik 5.0 lb	10,408	30.6	6.3	22.2	1,846.8
Temik 5.0+5.0 lb	10,027	30.6	10.4	36.6	1,895.8
Temik 3.5lb	15,834	26.6	6.6	21.5	1,727.2
Control	12,481	27.4	6.3	22.4	1,419.7
FLSD =(0.05)	2,203	4.1	3.8	14.9	512.4

Table 3. Economic analysis of nematicide applications .

Treatment	Cost/acre	Yield increase	Gross return	Net return
Telone 1.5 gal	18.00	376.16	225.70	207.70
Telone 3.0 gal	36.00	298.95	179.37	143.37
Telone 4.5 gal	54.00	395.39	237.23	182.23
Temik 5.0 lb	16.00	162.30	97.32	81.38
Temik 5.0+5.0 lb	32.00	180.92	108.55	76.55
Temik 3.5 lb	11.20	116.85	70.11	58.99

Telone = \$12.00gal

Temik = \$3.20lb

Cotton = \$0.60lb