

**FALL VS SPRING APPLICATION OF TELONE II (1,3-dichloropropene) FOR ROOT KNOT NEMATODE (*Meloidogyne incognita*) CONTROL IN COTTON IN ASHLEY COUNTY, ARKANSAS**

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**Abstract**

Telone II (1,3-dichloropropene) has been shown to be an effective soil fumigant for control of root knot nematodes (*Meloidogyne incognita*) in cotton when applied in the spring. However, if fall applications are as effective as spring applications for nematode control, the time-of-application window for growers would be expanded. Replicated strips of fall, spring and untreated checks (chiseled but no fumigant applied) were established to see if fall applications were as effective as spring applications. Fall applications were as effective as spring applications in reducing nematode populations until at least first cotton bloom. Yields also showed no significant difference between fall and spring applications of Telone II, and in both cases lint yields were higher than the unfumigated controls.

**Introduction**

Telone II has been shown in tests to be an effective nematicide in cotton for management of root knot nematode. In Arkansas, both research and farm applications have all been done in the spring, prior to planting. Producers are interested in the possibility of applying Telone II in the fall in order to spread the time-of-application window. Tests were established on the Bruce Bond farm, near Portland, Arkansas on a field that was heavily infested by the root knot nematode to determine if fall applications of Telone II were as effective as spring applications.

**Materials and Methods**

Telone II at the rate of 3 gallons per acre was applied on November 7, 2001 following stalk destruction (fall application), using a ripper hipper fitted with injector tubes to place the material approximately 12" below the soil surface. At the same time the untreated check was also ripped and hippered with the same equipment, but with no Telone II applied. In the spring, Telone II was applied on April 6, 2002 to previously undisturbed plots at the rate of 3 gallons per acre using the same equipment. Each plot was replicated 3 times. The plots were 8 rows wide and approximately 2,640 ft. long. The cotton variety used in all plots was Stoneville 4691B that had been treated with the insecticide Gaucho for early-season insect control.

Root knot nematode samples were taken from the center 2 rows of all plots to a depth of 12" at 6 different times throughout the year. These sampling times were as follows: prior to fall application (November 6, 2001), mid-winter (January 29, 2002), prior to spring application (April 6, 2002), at cotton emergence (May 7, 2002), at first bloom (July 8, 2002), and at maturity (November 11, 2002). Samples were sent to the University of Arkansas nematode lab in Hope, Arkansas for analysis. Yields were taken by harvesting the entire plot and seed cotton was weighed in a boll buggy equipped with scales. Lint yields were based on 35% turnout.

**Results**

Nematode samples taken prior to the fall applications of Telone II confirmed the presence of threshold levels of root knot nematodes in all the plots. Sampling in mid-winter showed a significant reduction in nematodes in the Telone II fall-treated plots. The untreated check which had been bedded with the ripper hipper equipment also showed a decrease in the nematode population. Samples in the spring, taken prior to Telone II application, showed high levels of root knot nematodes in both the plots to receive spring application of Telone II and the check plots. The fall-treated plots continued to show very low levels of nematodes (Table 1). Results of sampling at cotton emergence showed near zero numbers of root knot for all plots at cotton emergence. High levels of nematodes were found in the check at first bloom but very low levels were found in both the fall and spring Telone II test plots at first bloom. At crop maturity nematode levels in all plots had increased.

Yields were similar between fall and spring fumigation with Telone II (Table 2). Fall-treated plots yielded numerically slightly less lint (27lb. lint per acre), but this was not a significant difference ( $P=0.05$ ). The yield for the unfumigated Check was significantly lower than for either the fall or spring treated plots (Table 2).

## Summary, Conclusions and Discussion

The results in this test indicate that the fall application of Telone II was as effective as the spring application for root-knot nematode in cotton in southeastern Arkansas. It was noted that the nematode numbers in the untreated Check were apparently influenced by the fall tillage (running the ripper hipper through the plots), even though no Telone II was applied. This would indicate that fall tillage alone does have some influence on nematode over-wintering capabilities.

Growers have several things to consider when considering fall versus spring fumigation for the control of nematodes. On the positive side, fall applications would allow producers a much wider window for treatment rather than just considering the spring application window which many times can be very short. Also, the soils in the fields in Ashley County, Arkansas many times are drier in the fall than in the spring which would allow for better fumigant movement in the soil of the treated area. However, a practical factor that also must be considered is the fact that cash flow for most producers is at its lowest in the fall just after harvest and out-of-pocket costs for the fumigant at this time of year may not be an option. While creative financing could be worked out to deal with this problem, an additional consideration in this area is in situations where the land is being rented. The producer must be assured that he will have the land again the following year before going to the expense of applying Telone II in the fall.

Table. 1. Root-knot nematode population densities and cotton yield after fall or spring application of Telone II.

Treatment	Root-knot nematodes per pint of soil <sup>1</sup>						
	Prior to fall fumigation	Mid-winter	Prior to spring fumigation	At cotton emergence	At first bloom	At cotton maturity	Days to maturity
Fall fumigation	350 a <sup>3</sup>	38 b	38 b	0 a	76 b	606 a	90
Spring fumigation	1,300 a	1,023 a	871 a	0 a	76 b	1,099 a	90
No fumigation <sup>2</sup>	1,500 a	379 a	682 a	76 a	3,586 a	1,175 a	89

<sup>1</sup>Samples collected to a depth of 12 inches.

<sup>2</sup>Chisel (ripper-hipper) was run through the plots without fumigant.

<sup>3</sup>Means within columns followed by the same letter do not differ significantly at P=0.05 by Duncan's Multiple Range Test.

Table 2. Lint Yield/Acre.

Treatment	Rep 1	Rep 2	Rep 3	Average	Difference from Spring
Fall	1320	1242	1282	1281 ab	27
Spring	1268	1307	1349	1308 a	-
Check	1180	1240	1187	1202 b	106