EVALUATION OF NEMATICIDES FOR SOUTHERNROOT-KNOT NEMATODES (*MELOIDOGYNE INCOGNITA*)

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Abstract

Southern root-knot nematode, *Meloidogyne incognita*, have become a serious problem for many southwest Georgia farmers, especially in the deep sandy (Lucy sandy loam) soils that are predominate in the area. Crop rotation is important in suppressing southern root-knot nematodes, but may not always be possible or practical. A few cotton varieties grown in southwest Georgia are tolerant to southern root-knot nematode, but under heavy populations yields can still be severe. Chemical control would then be the only alternative to prevent economical yield losses due to southern root-knot nematode.

Since cotton is a relatively new crop in Decatur County (there was only 350 acres planted in 1986) farmers have questions about which chemicals provide the greatest yield responses in fields with above threshold levels of southern root-knot. A survey conducted in 1995 showed that 38% of all cotton fields in Decatur County have southern root-knot nematode and over 12% of those fields were above threshold. It was important, therefore, to determine which nematicides and rates are most cost effective for maintaining profitable yields.

A field was chosen in Decatur County where severe damage by southern root-knot nematode was observed in 1995. Four nematicide treatments were used including 10 lb./A Nemacur 15G at-planting; 7 lb./A of Temik 15G at planting plus Temik 15G at 7 lb./A banded over-the-top at pinhead square; Temik 15G at 5 lb./A at-planting and Temik 15G at 5 lb./A at-planting plus 8.5 oz./A of Vydate C-LV applied as a foliar spray at pinhead square and 8.5 oz./A of Vydate C-LV applied as a foliar spray 14 days later. The check plots containing Thimet was applied at 5 lb./A at-planting for thrips control. All treatments and nontreated control were replicated four times. These treatments were compared to an in-row fumigant, Telone II applied at 2.5 gal./A with a subsoil shank in-furrow and bedded two weeks before planting and Temik 15G applied at 5 lb./A applied at planting. The replicated treatments were also compared to Telone II applied at 2.5 gal./A with a subsoil shank in-furrow and bedded two weeks before planting and a insecticide, Thimet 15G applied at 5 lb./A at-planting for thrips control.

The results showed no significant differences between the treatments and the nontreated check plots. The similiarity in yields was due to adaquate rainfall or irrigation during the study.

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Introduction

Research in the Southeast U. S. has shown significant yield increases by applying Telone II at 3-3.5 gal./A in-row with a subsoil shank and bedding 10-14 days before planting plus applying Temik in-furrow (3.5-5 lb./A) and at- planting in fields where southern root-knot nematode are a problem. Previously, four field demonstration trials in Decatur County has shown significant yield increases with Telone II + Temik 15G treatments over Temik 15G in fields which had above threshold levels of southern root-knot nematode (Table 1.).

Research in the southeast U. S. makes it unclear if other nematicide treatments would be viable options to Telone II fumigant. Also, it is uncertain if nematicides are viable economic options for low to moderate levels of root-knot nematode.

Material and Methods

A cotton field with moderate to low levels of southern root-knot nematodes was selected for evaluation of nematicides for southern root-knot nematodes in Decatur County, Georgia. Plots consisted of 4-rows (36 inch rows) and 50 feet long The field was subsoiled and bedded on May 3 and the field was planted on May 17 with the cotton variety DPL 5415. Treatments were arranged in a randomized block with four replications. All weed and insect control and fertilization practices follow state recommendations for growing cotton.

Four labeled nematicide treatments were used. The check treatment received Thimet 15G (*phorate*) at a rate of 5 lb./A applied in the seed furrow at-planting to control thrips. Treatment one received Nemacur 15G (*fenamiphos*) at the rate of 10 lb./A with 5 lb./A applied in the seed furrow a-planting and 5 lb./A applied in a 10 inch band over the row a- planting. Treatment two received Temik 15G (*aldicarb*) at the rate of 7 lb./A applied in the seed furrow at- planting and 7 lb./A applied over the top of the row in a 10 inch band at pinhead square (applied June 24). Treatment three received Temik 15G at 5lb./A applied in the seed furrow at-planting. Treatment four received Temik 15G 5 lb./A applied in the seed furrow at-planting plus Vydate C-LV (*oxamyl*) at 8.5 oz/A foliar applied on June 26 (pinhead square) and Vydate C-LV at 8.5 oz./A foliar applied on July 10. All treatments were compared to Telone II (*dichloroproene*) applied at 2.5 gal./A with the subsoil

shank and bedded on May 3. Thimet 15G was applied at 5 lb./A in-furrow and at-planting. Both chemical were applied in the four rows located on the left side of the plots Telone II applied at 2.5 gal./A with subsoil shank and bedded on May 3 and Temik at 5 lb./A was applied in-furrow and at-planting on the four rows located on the right side of the plots.

Soil samples for nematodes were taken at- planting and harvest. Cotton was harvested from the middle two rows of each plot.

Conclusion

Below established threshold levels of southern root-knot nematode were detected in soil samples taken at-planting in spite of the high level of nematode damage detected in the previous year's cotton crop. The results showed that there were no significant differences in lint yields between the nematicide treatments compared to the check plots (Table 2.). The cotton plants had adequate rainfall or were irrigated during dry periods of the growing season. The natural rainfall and available irrigation may have been responsible for the similiar yields. Also, the nematode level, which was above threshold in 1995 for the field ,was below or just at-threshold in 1996 in the trial. The authors believe that was due to variations in nematode populations within the study site.

Table 1.
Decatur County Cotton Nematicide Research

Treatment	Yield Lbs Lint/A	Increase/A
1993		
3.5 gals/A Telone II + 3.5 lb/A Temik 15G	1,149	+230
No Telone + 3.5 lb/A 3.5 lb/A Temik 15G	919	
1994		
3.5 gals/A Telone II + 3.5 lb/A Temik 15G	1,142	+165
No Telone + 3.5 lb/A Temik 15G	977	
1995		
3 gals/A Telone II + 3.5 lb/A Temik 15G	967	+179
No Telone + 3.5 lb/A Temik 15G	788	
3.5 gals/A Telone II + 3.5 lb/A Temik 15G	1,063	+122
No Telone + 3.5 lb/A Temik 15G	941	

Telone II was applied with sub-soil shank and bedded 10-14 days ahead of planting. Temik 15G was applied in furrow at planting.

Table 2.
1996 Decatur County Cotton Nematicide Research

	Yield (Lbs/A)	*A	*B
Thimet 15G @ 5 lbs/A in-furrow	1211A	1194A	1150A
Temik 15G @ 7 lbs/A in-furrow + Temik 15G @ 7 lbs/A banded June 26	1266A	1254A	1126B
Nemacur 15G @ 5 lbs/A in-furrow + Nemacur 15G @ 5 lbs/A banded over-the-row at planting	1214A	1063A	1190A
Temik 15G @ 5 lbs/A in-furrow	1205A	1154A	1114A
Temik 15G @ 5 lbs/A in-furrow + Vydate C-LV @ 8.5 oz/A applied June 26 + Vydate C-LV @ 8.5 oz/A applied July 10	1190A	1169A	1145A

Means with the same letter are not significantly different.
*A- 2.5 gals/A Telone II + 5 lbs/A Thimet 15G
*B- 2.5 gals/A Telone II + 5 lbs/A Temik 15G