

RECOVERY OF RENIFORM NEMATODES AT VARIOUS SOIL DEPTHS IN COTTON

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Abstract

The reniform nematode, *Rotylenchulus reniformis*, was first discovered in cotton in Tennessee in 1992. Annual nematode surveys since 1997 have detected reniform nematodes in 100 fields in Crockett, Dyer, and Madison counties in the center of Tennessee's cotton production area.

Attempts at control with various non-fumigant nematicides have not been consistent even when nematode populations were high. One possible explanation for the lack of control is that reniform nematodes extend deep into the silt loams of West Tennessee, which makes it difficult to achieve economical control.

Applications of aldicarb (15G) were made using the variety DPL 451 BG RR at planting on May 8 at 5.0 lb/A in-furrow and at 5.0 lb/A in-furrow plus a side dress application of 5.0 lb/A at the pinhead growth stage on June 14. Plots were planted in a conventionally-tilled Morganfield silt loam. Rows were 38" on center and 1,000' long. Each treatment was 8 rows wide and replicated twice. Yields were determined by picking the entire plot with a 4-row John Deere picker and weighing on electronic wheel scales with an accuracy of 99.3 percent.

Reniform nematode samples were obtained by using a 36" hydraulic/electric truck-mounted soil probe. Each sample was divided at 6" intervals to obtain 6 subsamples. Samples were replicated 12 times, bagged, refrigerated, and sent to the Agricultural Extension Service Diagnostic Lab in Nashville, TN, for nematode counts.

Two tests were conducted side by side on the same farm in Madison County, TN. The first test was designed to determine the depth of reniform nematode infestation in the soil. The second test was to determine the depth of control with aldicarb (15G) with an in-furrow application and a combination treatment of in-furrow aldicarb plus a side dress application of aldicarb.

Results from the various soil depths showed that at planting time reniform nematodes were present at all levels and the population was highest at the 24-30" depth (1,875/pt.). By June 15, nematode counts had risen to 6,075/pt. for that depth and had risen to 1,800 nematodes/pt. at the 30-36" depth (see table 1).

Where aldicarb (15G) was used at 5 lb/A in-furrow, the nematode population was reduced from 11,500 to 5,600/pt. at the 1-18" depth, but yields were increased by only 22 lbs. lint/A. The addition of 5 lb/A as a side dress did not further reduce the reniform population, but yield was increased by an additional 36 lbs. lint/A. At 18-36", nematode numbers were increased from 7,400 to 11,300/pt. with 5 lbs. aldicarb in-furrow. The addition of the 5 lb/A aldicarb as a side dress reduced the nematode population from both the untreated and the 5 lb/A aldicarb in-furrow treatment at the 18-36" depth. (see table 2).

These results show that the reniform nematode can be detected at depths up to 36" and that the usual increase in nematode numbers that occurs in the upper 1-12" during the growing season also occurs at 12-36" depths. The application of 5 lb/A aldicarb in-furrow reduced the nematode numbers at the 1-18" depth but did not reduce the nematode numbers at the 18-36" depth. The addition of 5 lb/A of aldicarb as a side dress to the 5 lb/A in-furrow increased yields and reduced the number of nematodes in the samples. More work needs to be done to verify these results, but it is clear that the reniform nematode is active at depths at least down to 36". At these extreme depths, aldicarb rates may need to be increased through the use of side dress applications. This may explain why producers have difficulty in achieving adequate control with only 5 lbs. of aldicarb in-furrow.

Table 1. Soil Depth and Reniform Nematode Population.

Inches Soil Depth	Reniform/pt. Soil	
	May 8	June 15
0-6	1200	1800
6-12	1800	2325
12-18	600	1350
18-24	225	5225*
24-30	1875	6075
30-36	375	1800

*Estimate

Table 2. Effect of aldicarb (Temik 15G) on Cotton Yields and Reniform Nematode Population.

	Yield	*Reniform/pt. soil & soil depth	
	lb lint/A	1-18"	18-36"
Untreated	377	11,500	7,400
Temik 15G 5 lb/A in-furrow	399	5,600	11,300
Temik 15G 5 lb/A in-furrow plus 5 lb/A side dress	435	6,600	5,725

* At harvest