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The Lance Nematode, *Hoplolaimus magnistylus*, on Cotton in Arkansas[1]

R. T. Robbins,[2] V. M. McNeely,[3] and G. M. Lorenz, III[4]

Abstract: The population density of *Hoplolaimus magnistylus*, a lance nematode, in cotton was determined at planting, mid-season, and harvest during the 1995 and 1996 growing seasons for a Poinsett County, Arkansas field. Nematode populations increased from planting to harvest in 1995 but declined in 1996. Application of aldicarb at planting at rates of 0.59 or 0.84 kg ai/ha did not influence either nematode population density or cotton yield. This study indicates that *H. magnistylus* is not a serious pest of irrigated cotton in Arkansas.

Key words: aldicarb, control, cotton, *Gossypium hirsutum*, *Hoplolaimus magnistylus*, nematode, pathogenicity.

Hoplolaimus magnistylus Robbins was first identified in May 1980 from soil samples taken on the Cotton Branch Experiment Station, Marianna, Arkansas. This nematode species has been found in association with soybean (*Glycines max* L.), corn (*Zea mays* L.), cotton (*Gossypium hirsutum* L.), sassafras (*Sassafras albidum* Nees), and wild plum (*Prunus americana* Marsh) (Robbins, 1982) and has been reported only from Arkansas, Louisiana (Overstreet, pers. comm.), and Mississippi. *Hoplolaimus columbus* Sher, another species of lance nematode, occurs primarily in the coastal plains of Georgia, North Carolina, and South Carolina where it causes serious damage to cotton. It is considered to be the primary nematode pest on cotton in South Carolina (Mueller, 1993). High populations of *H. magnistylus* were identified in March 1994 from routine samples from a University of Arkansas Cooperative Extension Service Cotton Research Verification Trial in Poinsett County, Arkansas. Because little is known about the pathogenicity of this nematode, a study was conducted in the field to determine if *H. magnistylus* is an economic threat to the production of cotton in Arkansas. The objectives of this study were to determine if *H. magnistylus* affected cotton yield and to determine the effectiveness of selected rates of aldicarb on its control.

Materials and Methods

Experiments were conducted in 1995 and 1996 in a field of irrigated cotton cv. DPL 20 near Harrisburg, Poinsett County, Arkansas. The soil was a Collins silt loam (coarse-silty, mixed, acid, thermic, Aquic Udifluvents) with 3% sand, 82% silt, 15% clay, and 1.7% organic matter. Experimental design of the test was a 3 × 3 Latin Square consisting of 6-row plots 15.23 m long on 0.965-m centers. Treatments were replicated 3 times in three different areas in the field for a total of 9 replications per treatment. Plot locations were determined by grid-sampling the field, and areas with the highest *H. magnistylus* population levels were selected. Treatments were: (i) untreated check, (ii) 0.59 kg ai aldicarb/ha, and (iii) 0.84 kg ai aldicarb/ha. Aldicarb applications were made in-furrow with a six-row planter. A foliar spray of 0.114 kg ai acephate/ha was used to control thrips in the untreated check. Nematode samples consisting of 10 cores (25 cm deep, 2.3-cm diam.) were taken from each plot at planting (31 May 1995, 22 May 1996), mid-season (18 July 1995, 23 July 1996), and harvest (13 November 1995, 28 October 1996). *Hoplolaimus magnistylus* population densities were determined from a 100-cm^3 subsample collected after thoroughly mixing each sample. The samples were suspended in water and poured through nested 850- over 38-

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[2] University of Arkansas, Department of Plant Pathology, Fayetteville, AR 72701.

[3] Formerly, Arkansas Cooperative Extension Service, Poinsett County, Harrisburg, AR. Currently, Rice Tec. Inc., Marion, AR 72364.

[4] Arkansas Cooperative Extension Service, 2301 South University, P.O. Box 391, Little Rock, AR 72203.

E-mail: rrobbin@comp.uark.edu

TABLE 1. Mean numbers of *Hoplolaimus magnistylus* and cotton yields after treatment with aldicarb in an Arkansas field in 1995 and 1996.

Aldicarb (kg ai/ha)	*H. magnistylus* per 100 cm^3 soil			Yield (kg/ha)	
	At-plant	Midseason	At-harvest	Seed cotton	Lint
		1995			
None	42	31	149	3,286	1,186
0.59	29	58	103	3,537	1,296
0.84	59	48	129	3,438	1,250
		1996			
None	86	38	61	1,987	752
0.59	67	29	62	1,696	646
0.84	81	27	44	1,833	684

All 1995 data and nematode data of 1996 are means of nine replications. Yield data for 1996 are means for six replications due to a severe weed infestation in one test area. No significant ($P > 0.05$) differences were found.

µm-pore sieves. The nematodes and debris retained on the 38-µm-pore sieve were separated by sugar flotation-centrifugation (Jenkins, 1964). Seed cotton yields were determined by hand-picking 1.53 m of the two center rows of the six-row plots. Seed cotton samples were ginned with a laboratory gin to determine lint yield. Nematode and yield data were analyzed using appropriate statistical methods.

Results and Discussion

H. magnistylus numbers were similar among treatments at any sampling date for either 1995 or 1996. Seed cotton and lint yields were similar in all treatments each year (Table 1). No significant differences in nematode numbers, seed cotton yield, or lint yield were detected statistically. The lower yields in 1996 may be attributed in part to infestations of morningglory and cocklebur, and also to a wet fall that delayed harvest. In both years aldicarb treatments had no apparent effect on *H. magnistylus* numbers, seed cotton yield, or lint yield when compared to the untreated check.

In Arkansas low numbers of *H. magnistylus* are found frequently in cotton and soybean soil samples, whereas high numbers are found infrequently. In Arkansas this nematode species is found primarily in silty loam soils. The *H. magnistylus* numbers in the study field were the highest and most evenly distributed the senior author had observed in more than 15 years of evaluation of Arkansas research and grower samples. The infrequency of high nematode numbers, limited nematode occurrence, and the results of these tests suggest further testing of *H. magnistylus* is not warranted in Arkansas. In conclusion, the data collected from this 2-year study indicate that the lance nematode, *Hoplolaimus magnistylus,* poses little economic threat to irrigated cotton in Arkansas.

Literature Cited

Jenkins, W. R. 1964. A rapid centrifugal-flotation technique for separating nematodes from soil. Plant Disease Reporter 48:692.

Mueller, J. D. 1993. Lance nematodes. Proceedings of the Beltwide Cotton Conferences, pp. 176–177.

Robbins, R. T. 1982. Description of *Hoplolaimus magnistylus* n. sp. (Nematoda: Hoplolaimidae). Journal of Nematology 14:500–506.