EFFECTS OF COLUMBIA LANCE NEMATODE ON COTTON GROWTH AND YIELD MATURITY

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Abstract

Effects of Columbia lance nematode (*Hoplolaimus columbus*) (CLN) on cotton growth and yield maturity were measured at two locations in Barnwell County, South Carolina in 1996 and 1997. 'Stoneville LA 887' was planted at each location at 6 seeds/ft row on 38-inch centers. Plot lengths were 50- to 80-ft long. Each location, Edisto Research and Education Center and Youngblood Farm, was naturally infested with CLN. Each experiment was arranged in 8 to 12 randomized complete blocks. Each replication consisted of paired plots with 4 rows non-treated and 4 rows treated with 6 gal/A 1,3-dichloropropene (Telone II). Nematicide treatment was applied in-furrow two weeks prior to planting and suppressed CLN populations up to 90% in 1996 and 80% in 1997. Plant mapping was conducted at first-bloom (50% of the plants in the field obtained a white flower on the first sympodial branch at the first position) and at harvest to determine the mechanisms of CLN-induced yield losses. Determination of yields were by both machine picking the center two rows of each plot and hand-picking 10-ft row sections of row for 2- to 4-consecutive weeks prior to machine harvest. Yield losses of 17% occurred in 1996 at both locations and 24% yield losses occurred at both locations in 1997. Sequential hand-picked yields indicated that maturity was delayed by 32% and 8% in 1996 and 1997, respectively. The non-infected plants had a greater percentage of harvestable lint available by the first picking date. A significantly greater percentage of lint was available later in the season for the CLN-infected cotton indicating a delay in harvest maturity. Plant mapping showed that a significant reduction in the number of harvestable bolls per plant in the infected plants was the cause of yield losses. Neither total nodes, total fruiting sites, nor number of sympodial branches per plant differed between the treated and non-treated plants at either location. Also, neither the number of fruiting positions at either position one or two differed between treatments. Fruit retention on a whole plant basis also showed no significant difference between treatments. However, retention of second position harvestable bolls was 23% less in the CLN-infected plants than the non-infected plants. Although CLN densities may be low, cotton grown in highly productive fields may incur significant yield losses. The subtle effects of CLN on cotton growth, i.e., plant height, and performance, i.e., boll production and maturity, can only be identified by careful plant mapping and sequential harvesting. By understanding CLN effects on cotton, advances may be made towards identifying tolerant cultivars and management practices which limit CLN-induced yield losses.

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