

INVESTING IN THE FUTURE OF NEMATODE MANAGEMENT

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Abstract

Plant-parasitic nematodes cause the most economically damaging diseases of cotton (*Gossypium hirsutum*). Improving the three principal means of nematode management, biological, cultural, and chemical, has been hindered by the difficulty of phenotyping lines for nematode reaction, market variation in gross returns from crops, and the relatively few numbers of effective nematicides, respectively. In 2003, Cotton Incorporated identified opportunities to improve nematode management by investing in host plant resistance breeding and precision application technology. Cotton Incorporated initiated a coordinated Beltwide research program to identify genetic resistance to nematodes, characterize the inheritance of the resistance genes, and develop markers and germplasm lines to assist breeders. In a separate effort, Cotton Incorporated cooperated with extension nematologists and agricultural engineers to develop technology for site-specific nematode treatment.

Breeding: The research effort has conclusively determined that resistance to the root-knot nematode (*Meloidogyne incognita*) is conferred by a two-gene system residing on chromosomes 11 and 14. Improved germplasm have been released from the Univ. of Georgia, Mississippi State Univ., and Texas AgriLife Univ. in cooperation with USDA-ARS and Cotton Incorporated. Whereas in 2002, there were no documented sources of resistance to reniform nematode (*Rotylenchulus reniformis*), three are now known, one from *G. barbadense* (accession GB 713), and one each by introgression from *G. longicalyx* and *G. aridum*.

Site-Specific Management: Research has been supported in AL, AR, GA, LA, MS, NC, and SC. At a recent meeting at Edisto, SC, field researchers in nematode management agreed to summarize developments in equipment, data utilization, and field treatment to produce a series of research bulletins for growers, agents, and consultants. The outreach effort includes active communication with nematicide manufacturers.

Future Plans: Cotton Incorporated's intention is to foster further cooperation between public and private researchers to achieve the most rapid possible advancement in genetic and field treatment resources for nematode management.