

**OBSERVATIONS FROM TWENTY GROWTH
CHAMBER EXPERIMENTS COMPARING
RENIFORM WITH ROOT-KNOT NEMATODE
REPRODUCTION ON COTTON**

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Abstract

Data on nematode reproduction are generally expensive and labor intensive to obtain. During the course of several projects on diverse aspects of nematode resistance in cotton, we have accumulated data from a series of more than 20 growth chamber experiments in which reproduction by root-knot (*Meloidogyne incognita*) and reniform (*Rotylenchulus reniformis*) nematodes were directly compared on various cotton genotypes under standardized growing conditions. Altogether, more than 5,000 potted plants were individually processed to evaluate nematode reproduction. The two nematode species were directly compared in these experiments in 6-12 replicate pairs on more than 300 cultivars, breeding lines, and primitive accessions of Upland cotton. We also measured plant height, foliar and root weights, root length, main stem nodes, fruiting, gall index for *M. incognita*, number of vermiform stages of *R. reniformis*, second-stage juveniles of *M. incognita* in some cases, and eggs per plant for both nematodes in all pots. Cumulatively, this large data set allowed us to test hypotheses regarding relationships between sources of nematode resistance in cotton, and to compare the efficiency of methods for measuring nematode resistance in cotton. From a methodological standpoint it was noteworthy that gall index was found to be highly correlated with extractable eggs of *M. incognita* but a less variable and cheaper indicator of resistance than the egg count. In terms of man hours per plant genotype and magnitude of experimental error, vermiform stages of *R. reniformis* extracted from soil gave more efficient data than eggs from roots. With regard to sources of nematode resistance in cotton, reproduction by *R. reniformis* and galling induced by *M. incognita* were found to be weakly but significantly correlated; complete suppression of galling was associated with a 40% average decrease in *R. reniformis* egg production per plant. Reproduction by *M. incognita* commonly differed 100-fold while reproduction by *R. reniformis* seldom differed more than 5-fold among cotton genotypes. The latter result

suggests that cultivars with near immunity to *M. incognita* and moderate but useful levels of resistance to *R. reniformis* can be developed from known genotypes of *G. hirsutum*.