

IMMUNOLOGICAL ASPECTS OF COTTON RESISTANCE  
TO ROOT-KNOT NEMATODES, MELOIDOGYNE SPP.

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Immunological cross reactivity of cotton cultivars and plant parasitic nematodes has been explored as a novel means of predicting the degree of host specificity or resistance to root-knot nematode, Meloidogyne spp.

Antisera of eggs and larvae of M. incognita, M. javanica and for roots of all plants were prepared by injection of antigenic preparations into New Zealand white doe rabbits. Antisera and antigens were reacted in all combinations in agar-gel, double diffusion tests.

Results of these tests (Table 1) demonstrate that all cultivars of cotton plants as well as soybean (c.v. Kino) share common antigens with M. incognita and not with M. javanica or a fungal-feeding nematode, Aphelenchus avenae. Oat plants (c.v. Victory) which are not penetrated by any of these nematode species did not cross-react with them.

All four cultivars of cotton plants tested are easily penetrated by M. incognita. However, only a very few of the larvae develop to maturity and initiate gall formation in resistant (Clevewilt) cultivars, and none do so in immune (RNR 623) cultivars.

Thus nematode development in host roots and not penetration would seem to be the principal measure of resistance. Since the common antigen relationship appears to indicate only those nonhosts resistant to penetration, it is not likely to be useful in breeding programs for cotton resistance to nematodes.

Table 1. Serological cross reactivities of plants and nematodes based on agar-gel double diffusion tests.

Antigens	Antisera										
	MB	CW	A56	A63B	Soybean	oat	M.i. eggs	M.i. larvae	M.j. eggs	M.j. larvae	A. avenae
MB <sup>c</sup>	+ <sup>a</sup>	+	+	+	-	-	+	+	-	-	-
Clevewilt <sup>d</sup>	+	+	+	+	-	-	+	+	-	-	-
Auburn 56 <sup>e</sup>	+	+	+	+	-	-	+	+	-	-	-
Auburn 623B <sup>f</sup>	+	+	+	+	-	-	+	+	-	-	-
Soybean	- <sup>b</sup>	-	-	-	+	-	+	+	-	-	-
oat	-	-	-	-	-	+	-	-	-	-	-
<u>Meloidogyne</u> <u>incognita</u> -eggs	+	+	+	+	+	-	+	+	+	+	+
<u>M. incognita</u> larvae	+	+	+	+	+	-	+	+	+	+	+
<u>M. javanica</u> eggs	-	-	-	-	-	-	+	+	+	+	+
<u>M. javanica</u> larvae	-	-	-	-	-	-	+	+	+	+	+
<u>Aphelenchus</u> <u>avenae</u> -larvae and adults	-	-	-	-	-	-	+	+	+	+	+

a Common precipitin band detected

b Common precipitin band not detected

c Susceptible cultivar of cotton

d Resistant cultivar of cotton

e Moderately resistant cultivar of cotton

f Immune cultivar of cotton