

DETECTION OF RENIFORM NEMATODE RESISTANCE IN PRIMITIVE GOSSYPIUM HIRSUTUM AND G. BARBADENSE DURING A SURVEY OF THE U.S. NATIONAL COTTON COLLECTION AND INITIATION OF RESEARCH TO INCORPORATE RESISTANCE INTO AGRONOMIC COTTON

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Abstract

A survey of the U.S. National Cotton Collection classified 18 *G. barbadense* and six *G. hirsutum* accessions as moderately resistant to the reniform nematode, based on having nematode populations less than 34% those on the standard susceptible control Deltapine 16. Three of the resistant *G. hirsutum* accessions also exhibited root-knot nematode resistance comparable to that seen in the strongest sources of root-knot nematode resistance within primitive *G. hirsutum*. Other accessions with reniform nematode resistance lacked root-knot nematode resistance. Five accessions of *G. barbadense* were classified reniform nematode resistant, based on having less than 10% as many nematodes as Deltapine 16, and one of these, GB-713, had 3% as many nematodes in three experiments. Resistant accessions differed phenotypically in the greenhouse and came from widely separated geographic origins. The independence, combining ability, inheritance, and expression within agronomic backgrounds, of the genes conferring nematode resistance is being evaluated via selected intra and interspecific crosses involving reniform and root-knot nematode resistant genotypes, including a half diallel cross among the six accessions of *G. hirsutum* that showed greatest resistance to the reniform nematode. Inheritance of the high level of resistance in *G. barbadense* GB-713 in crosses with *G. hirsutum* cv. Nem-X is being studied among F₁, F₂, and first backcross generations, and leaves are being collected to initiate work toward marker development. Resistant individuals also have been recovered among plants in USDA day-neutral germplasm lines derived from the resistant *G. barbadense* accessions, TX-1348 and TX-2468.