Reaction of Kenaf and Roselle to Three Root Knot Nematode Species

N. A. Minton, W. C. Adamson, and G. A. White

Nematologist, Geneticist, and Leader, Chemurgic Crop Investigations, Crops Research Division, ARS, USDA, Coastal Plain Experiment Station, Tifton, Georgia 31794, U.S. Plant Introduction Station, Savannah, Georgia 31405, and Beltsville, Maryland 20705, respectively.

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Kenaf (*Hibiscus cannabinus* L.) is a crop traditionally grown for its bast fiber. Recently, it has been recognized as a potential source of pulp for papermaking (1, 4). One of the major problems associated with its culture in the southeastern United States is its susceptibility to root knot nematodes (8).

Roselle (*H. sabdariffa* L.) was found resistant to *Meloidogyne incognita acrita* (Kofoid & White) Chitwood (8); however, its reaction to other species has not been studied. Roselle, a tetraploid relative of kenaf, is similar in appearance and usage but does not have the yield potential of kenaf. Crosses of the two species have been reported (7).

Hexaploid progenies have been evaluated for *M. incognita acrita* resistance (6) and are being increased for further tests. A previous report of *M. incognita acrita* resistance in *H. cannabinus* (8) is confirmed, and the reaction of many additional *H. cannabinus* and *H. sabdariffa* entries to three *Meloidogyne* species (*M. incognita acrita, M. javanica* [Treub, 1885] Chitwood, 1949 and *M. arenaria* [Neal, 1889] Chitwood, 1949) are reported in this paper.

TABLE 2. Mean root knot indices of roselle plants for three *Meloidogyne* spp.[a]

Entry	*M. incognita acrita*	*M. javanica*	*M. arenaria*
J59150	1.8 a[b]	1.1 a	3.0 a
J69149	1.9 ab	1.1 a	3.1 ab
J69147	2.0 ab	1.4 ab	3.1 ab
J69151	2.1 abc	1.2 ab	3.1 ab
J69146	2.5 bcd	1.2 ab	3.2 abc
J69152	2.7 cd	1.2 ab	3.4 abcd
J69148	2.7 cd	1.8 b	3.0 a
J69153	2.9 d	1.6 ab	3.0 a

[a] Gall index based on 1 = no galling; 2 = very light galling; 3 = moderate galling; 4 = heavy galling; 5 = very heavy galling.

[b] Means followed by the same letter are not significantly different at $P = .05$ according to Duncan's multiple range test.

We used the techniques of Minton et al. (2, 3). Tests at Tifton and Savannah, Georgia were similar but differed in some respects. At Tifton the experimental design consisted of four replications with five seeds/entry per replication; and approx 1,000 nematode larvae/seed were applied. At Savannah, three replications, 10 seeds/entry per replication, and approximately 600 nematode larvae/seed were used.

We tested 340 *H. cannabinus* entries, although data for only 15 entries are presented (Table 1). Complete records of all entries are on file at the Plant Introduction Station, Savannah, Georgia. No *H. cannabinus* entry was uniformly resistant to either of the three nematode species. But some plants in some lines were phenotypically resistant, indicating that these lines were segregating for resistance. *Meloidogyne incognita acrita* resistance in P.I. 292207 (A63-529), a Kenyan perennial, was reported by Wilson & Summers (8). Some, but not all, crosses of P.I. 292207 with breeding lines and varieties produced F_2 progenies segre-

TABLE 1. Mean root knot indices of kenaf plants for three *Meloidogyne* spp.[a]

Entry	*M. incognita acrita*	*M. javanica*	*M. arenaria*
P.I. 270105 (G7) × P.I. 292207	1.6 a[b]	2.7 cd	4.0 b
Everglades 71 × P.I. 292207	2.3 bc	2.5 bc	4.0 b
J69158	2.4 bcd	3.9 f	4.0 b
P.I. 207883 (BG52-75) × P.I. 292207	2.4 bcd	3.1 de	4.0 b
P.I. 207883 (BG52-52) × P.I. 292207	2.5 bcd	2.5 bc	4.0 b
P.I. 207883 (BG52-38) × P.I. 292207	2.8 cd	2.8 cd	4.0 b
J69127	2.8 cd	3.2 de	3.9 ab
J69163	3.0 de	2.8 cd	3.4 a
J69165	3.4 ef	3.9 f	4.0 b
Everglades 41	3.9 fg	4.0 f	4.0 b
P.I. 326024 (SH15R)	4.0 g	4.0 f	3.9 ab
P.I. 244859 (C108)	4.0 g	4.0 f	4.0 b
BG61-28 × P.I. 292207	4.0 g	3.6 ef	4.0 b
Everglades 71	4.0 g	4.0 f	4.0 b
P.I. 329183 (C2032)	4.0 g	4.0 f	3.9 ab

[a] Gall index based on 1 = no galling; 2 = very light galling; 3 = moderate galling; 4 = heavy galling.

[b] Means followed by the same letter are not significantly different at the 5% level according to Duncan's multiple range test.

gating for resistance to *M. incognita acrita* and *M. javanica*. Although the reaction of the parent line, P.I. 292207, has not been accurately evaluated in these tests because of poor seed germination, the line is probably segregating for resistance to both nematode species. Other African perennials (J69127, J69158, and J69163) also exhibited some resistance. Entry J69163 is especially interesting, since it was moderately resistant to all three nematode species. P.I. 189210 S-3 (data not shown), a Javanese introduction, that was also moderately resistant to *M. incognita acrita* and *M. javanica* is of special interest since it is a cultivated type of *H. cannabinus*.

Twenty-four *H. sabdariffa* entries were tested, but data for only 8 entries are presented (Table 2). Differences in resistance to nematode species were found among lines. All lines tested were more resistant than most *H. cannabinus* lines to the root knot species. Generally, the data indicate that *H. sabdariffa* possesses useful resistance to *M. incognita acrita* and *M. javanica*. Resistance to these species of nematodes also has been reported from field data (5, 8). *Hibiscus sabdariffa* was susceptible to *M. arenaria*.

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