

Reactions of Sorghum-sudangrass Hybrids and Pearl Millet to Three Species of *Meloidogyne*¹

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Sorghum-sudangrass hybrids and pearl millet, *Pennisetum americanum* (L.) Leeke., are grown extensively in the southeastern United States; the former is used for forage, seed, and summer cover crop and the latter, primarily for grazing, forage, and summer cover crop. The extended period during which these crops can be planted makes them especially adapted to a double-cropping system with winter-grown small grain or vegetable crops. Sorghum and millet follow most crops in rotation without serious cultural and disease problems (3), but many plant-parasitic nematodes that parasitize other crops also attack sorghum-sudangrass hybrids and pearl millet (2). McGlohon et al. (5) found that, in North Carolina, sudangrass [*Sorghum sudanense* (Piper) Stapf] supported reproduction of *Meloidogyne javanica* (Treub) Chitwood and *M. incognita* (Kofoid & White) Chitwood, and that 'Starr' millet [*P. americanum* (L.) Leeke.] did not support growth and reproduction of *Meloidogyne*. Preliminary observations indicated that, under field conditions, *M. incognita* attacks certain varieties of pearl millet.

The objective of this study was to determine the reaction of important sorghum-sudangrass hybrids and pearl millets to three species of this genus.

Seeds of the selected hybrids were planted in 5-cm clay pots containing methyl bromide-treated (0.45 kg/1.4 m³) Tifton sandy loam (85% sand, 10% silt, 5% clay). Seedlings of uniform size were selected after 2 weeks and transferred singly to 15-cm clay pots containing the medium described previously. A complete nutrient solution [840 gm of a commercial fertilizer, VHPF® (Miller Chemical Com-

pany, Baltimore, Maryland) plus 148 gm of MgSO₄·7H₂O in 100 liters of tap water] was added as needed.

Species of nematodes used were *Meloidogyne incognita* (Kofoid and White) Chitwood, *M. javanica*, and *M. arenaria* (Neal) Chitwood. The nematode inoculum consisted of 10 egg masses (ca. 3,000 eggs)/pot. The number of eggs/mass from roots of *Lycopersicon esculentum* Mill., 'Rutgers' was estimated by the sodium-hypochlorite method described by Loewenberg et al. (4). Ten replicates for each treatment were arranged in a randomized block on a greenhouse bench where the ambient temperature ranged from 25 to 32 C.

Roots were freed from soil 50 days after inoculation and examined for galls. The root-gall index was based on a 1 to 5 scale relative to percent of total root volume having galls: 1=no galls, 2=1-25, 3=25-50, 4=50-75, 5=75-100. Two, 2-gm samples of roots from each variety and each treatment were stained with cotton blue-lactophenol (1) and examined for nematode development and egg production.

Funk's hybrid sorghum x sudangrass Hybrid 78 and Haskel Harris' 1746 E sorghum were resistant to the three

TABLE 1. Root-gall indices of six pearl millets as influenced by three species of *Meloidogyne*.^a

Cultivar	<i>M. incognita</i>	<i>M. javanica</i>	<i>M. arenaria</i>
Gahi 1	2.5	1.5	1.0
Gahi 3	1.0	1.0	1.0
Millex 22	1.0	1.0	1.2
Tift 23 A x 1258	1.4	1.2	1.0
Tiflate	1.0	1.0	1.0
Pennington's Haygrazer	1.5	1.3	1.0

LSD ($P=0.05$): different varieties—same nematode species = 0.32
different nematode species—same variety = 0.12

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^a1-5 scale: 1=no galls, 2=1-25, 3=25-50, 4=50-75, and 5=75-100% roots galled.

Meloidogyne species. No symptoms or signs of nematode injury were observed in stained roots of sorghum. Larvae did not penetrate roots.

Root-gall indices of millet were positively related to numbers of egg masses present; therefore, only root-gall data are presented. Pearl millet varieties responded differently to the *Meloidogyne* species. 'Gahi 3' pearl millet was resistant to all species. 'Pennington's Haygrazer' and 'Gahi 1' were resistant to *M. arenaria* and susceptible to *M. incognita* and *M. javanica*. Several of the 10 plants of these two variable cultivars appeared to be resistant to these nematodes. 'Millex 22' and 'Tiflate' were resistant to *M. incognita* and *M. javanica*. In addition, Millex 22 was susceptible to *M. arenaria* but Tiflate was resistant. Tift 23 A x 1258 (an experimental hybrid not released) was resistant to *M. arenaria* and susceptible to *M. incognita* and *M. javanica*. These findings support observations that *Meloidogyne* spp. are potential pathogens to pearl millets under field conditions. Use of nematicides and selection of varieties, such as Gahi 3 pearl millet, with resistance to several species of

root-knot nematodes will delay buildup of these pests to damaging levels. This practice is especially important in cropping systems that include vegetable crops or other crops that are susceptible to *Meloidogyne* spp.

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