Infection of Sorghum Varieties by the Cotton Root-knot Nematode, *Meloidogyne incognita*

M. McClure , S. Husman, and M. Schmitt

Abstract

Twentythree varieties of sorghum, Sorghum bicolor, were evaluated for susceptibility to the cotton root-knot nematode, Meloidogyne incognita race 3. Eggs per gram of root were used as a measure of nematode reproduction and host susceptibility. The nematode reproduced on all varieties tested. Mean egg counts were lowest on the varieties Northrup King (NK) KS-737, M.F.; NK 1580,M; NK Ks-735 M.F.; NK 714Y M.F.; NK Lt. Bronze X 609 M.; Ciba-NK C-1506, M.; and Pioneer 8877, but these varieties are still considered to be hosts capable of sustaining or increasing nematode populations in cotton fields. All varieties were better hosts than cotton.

Introduction

The cotton root-knot nematode, *Meloidogyne incognita* race 3 is a wide-spread problem in Arizona including those areas where sorghum is grown in rotation with cotton. Sorghum is a known host of *M. incognita* but susceptibility varies greatly among varieties (McSorley and Gallaher, 1992) and post-season nematode populations fluctuate accordingly. Fortnum and Currin (1988) tested several varieties of sorghum for susceptibility to *M. incognita* and found that, compared to tomato, nematode reproduction was low, results that have been affirmed by Ibrahim et al. (1993). However, recent field trials in Arizona have shown that yield of cotton lint can be increased by pre-plant treatments of Telone when cotton follows sorghum. Therefore, greenhouse trials were conducted to determine the susceptibility of selected sorghum varieties to *M. incognita* race 3.

Materials and Methods

Seeds of 23 sorghum varieties were sown, 4 seeds to a pot, in 6-inch-diameter plastic pots, containing a sterile 3:1 mixture of washed mortar sand and sandy loam. Ten days after sowing, when the seedlings had reached a height of 2 inches, they were inoculated with 4,700 *M. incognita* infective juveniles per pot. Daytime greenhouse temperature was maintained at 28 +- 4 C and night temperature at 20 +- 3C. Plants were harvested 80 days after inoculation, the roots gently washed to remove adhering soil, and the nematode eggs extracted in 20 % household bleach. Each variety was replicated three times (three pots) and the experiment was repeated twice.

Results

Table 1. Susceptibility of selected sorghum varieties to the Cotton Root-knot Nematode, *Meloidogyne incognita.*

Sorghum Variety	Eggs Per Gram of Root
Pioneer 8877	550
730CS X19225	855
CIBA-N.K. Variety C1506 M.	891
837CS Lot# P40120	892
Pioneer 8505	1064
Northrup King KS-737 M.F.	1293
Asgrow A671 CP3A	1398
Pioneer 8771	1458
Desert Sun Marketing Co. 9322 9404431	1777
Desert Sun Marketing Co. 9300 9404431	1798
877CS Lot# P50182	1856
737CS Lot# 08728	2131
Asgrow A574 CP	2157
Northrup King KS-735 M.F.	2175
Asgrow A570 CPA	2242
Northrup King 714Y M.F.	2781
Northrup King Lt. BRONZE X-609 M.	2992
Northrup King 1580 M.	3250
Asgrow A459 CP3A	3294
Pioneer 8606	4796
Asgrow A571 CP3A	5210
Desert Sun Marketing Co. 0117 9404431	6704
Asgrow A425 CP3A	7357
Cotton, Delta Pine 5415	363
Egg Plant, Black Beauty	12776

Discussion

While there was considerable in variation in nematode reproduction among sorghum varieties, all varieties were suitable hosts for the cotton root-knot nematode, *M. incognita* and, based on the number of eggs recovered from infected root systems, sorghum is a better host than cotton. Sorghum rotation with cotton should be avoided if the land is infested with this nematode.

References

Fortnum, B.A. and R. E. Currin III . 1988. Host suitability of grain sorghum cultivars to *Meloidogyne* spp. Annals of Applied Nematology 2: 61-64.

Ibrahim, I. K. A., Lewis, S. A. and D. C. Harshman. 1993. Host suitability of graminaceous crop cultivars from isolates of *Meloidogyne arenaria* and *M. incognita*. Journal of Nematology (Supplement) 25:858-862.

McSorley, R. and R. N. Gallaher, 1992. Comparison of nematode population densities on six summer crops at seven sites in North Florida. Journal of Nematology (Supplement) 24:699-706.