2001 EVALUATION OF COTTON CULTIVARS GROWN IN RENIFORM NEMATODE INFESTED SOIL

C.G. Cook
Syngenta Seeds, Inc.
Victoria, TX
A.F. Robinson and A.C. Bridges
USDA, ARS,
College Station, TX
W.B. Prince
Syngenta Seeds, Inc.
Victoria, TX
J.M. Bradford and J.A. Bautista
USDA, ARS,
Weslaco, TX

Abstract

Reniform nematode infestations are becoming more widespread across the cottonbelt every year. Currently, there are no resistant commercial cultivars available to growers. In 2001, 28 entries were evaluated at the USDA-ARS North Farm reniform nematode nursery at Weslaco, TX. Average yield reduction between the fumigated and non-fumigated treatments was 27.8%. Six entries produced significantly higher lint yields than Stoneville 474 in the non-fumigated, reniform nematode infested plots. In the fumigated treatment, only N2387C and NX 2723ct produced significantly higher yields than Stoneville 474. Yield reduction between treatments were lowest for NX RN00513 (12.7%), DPL-SG215B/RR (13.2%), NX 2723ct (13.9%), and NX RN2126-1ctpc (14.2%). Yield reduction between treatments was highest for Phytogen PSC 355 (40.9%), NX C429-93-4ct (41.7%), and Fibermax 958 (44.5%). In general, Fibermax 832 produced the highest quality fiber. Results from the 2001 study indicate that germplasm with improved tolerance to reniform nematodes is being developed.

Introduction

Reniform nematodes (*Rotylenchulus reniformis* Linford & Oliveira) are a serious pest of cotton (*Gossypium hirsutum* L.) (Robinson, 1999). Parasitism generally results in stunted, unhealthy appearing plants, and lint yield reduction (Birchfield, 1963; Jones et al., 1959). Commercial cultivars which have dominated the cotton acreage since 1950 were reported to be highly susceptible to reniform nematodes (Robinson et al., 1999). This study is conducted annually to evaluate commercially available cultivars and promising new strains when grown in the presence of the reniform nematode and in Telone II fumigated soils.

Materials and Methods

The research plots are located at the USDA-ARS North Farm, Weslaco, TX. The soil type is Hidalgo sandy clay loam soil that has been in continuous cotton for 15+ years. Experimental design was a split-plot, with four replications. The Telone II fumigation and fertilizer (40 lb N/acre as Ammonium Sulfate) were applied on 14 December 2000. A side dress application of 40 lb N/acre (N32) was applied on 7 May 2001. Pendimethalin was applied at 1.0 quart formulation/acre as a preemergence weed control. Experimental plots were one row, 30 ft long and spaced 3.3 ft apart. Planting date was 8 March and harvest dates were 26 July and 7 August. Measurements reported are lint yield, yield reduction between treatments, fiber length, strength, and micronaire.

Results

Average lint yield was reduced 27.8% by reniform nematodes (Table 1). Lint yield in the untreated, reniform nematode infested plots was highest for NX 2723ct. Six entries, NX 2723ct, NX RN2126-1ctpc, RN00 513, RN00 516, RN00 519, and JaJo 8185, produced significantly higher yields than Stoneville 474. In the Telone II fumigated plots, only N2387C and NX 2723ct produced significantly higher yields than Stoneville 474. When yields were compared between treatments, percent yield reduction was lowest for NX RN00513, DPL- SG215B/RR, NX 2723ct, and NX RN2126-1ctpc and highest for Phytogen PSC 355, NX C429-93-4ct, and Fibermax 958. Fiber length was longest for Fibermax 832 and shortest for TAMU 1985FCx84-11 (Table 2). Fiber strength across treatments was highest for Fibermax 832 and lowest for DPL-SG215 B/RR. Micronaire values were extremely high in 2001, with several entries being in the discount range (>4.8 units). Based on yield

and percent yield reduction between treatments, the results indicate that progress is being made in developing germplasm with increased tolerance to reniform nematodes.

References

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Table 1. Lint yield in reniform nematode-infested (RN) and Telone II fumigated (TL) soils and percent yield reduction between treatments (PYR) of 28 cultivars and strains.

Entry	RN (lb/acre)	TL (lb/acre)	PYR (percent- reduction)
NX 2723ct	1319*	1531*	13.9
NX RN2126-1ctpc	1262*	1471	14.2
NX RN00513	1233*	1413	12.7
NX RN00516	1156*	1434	19.4
NX RN00519	1127*	1455	22.5
JaJo 8185	1075*	1377	21.9
Syngenta N 2387C	1018	1552*	34.4
TAMU-MAR280K-1-98	1017	1304	22.0
NX RN00526	1005	1355	25.8
Syngenta N 2108ss	943	1258	25.0
DPL-SureGrow 747	940	1152	18.5
DPL-SureGrow-215B/RR	917	1057*	13.2
JaJo 8098	905	1433	36.8
DPL 99Q85B	888	1193	25.6
TAMU 1985FCx84-11	873	1102*	20.8
NX 2622ct	872	1326	34.3
TAMU 96WD-22	860	1214	29.2
Stoneville 474	827	1329	37.8
MSU 8806-3-2-35	812	1245	34.8
NX C429-93-4ct	790	1354	41.7
TAMU 96WD-81	787	1206	34.7
DPL 00V32	771	1201	35.7
Fibermax 832	758	1104*	31.3
MSU 8806-3-2-21	746	1118*	33.3
Phytogen PSC 355	699	1183	40.9
TAMU- CA 3066/M-315	698	873*	20.1
TAMU- MAR-280L-2-98	690	1119*	38.3
Fibermax 958	609*	1097*	44.5

* Significantly different from Stoneville 474 at the 0.05 level of probability.

Table 2. Fiber length, strength, and micronaire of 28 cultivars and strains in reniform nematode-infested soil.

Entry (inches)	Length (g/tex)	Strength (units)	Micronaire
NX 2723ct	1.11	30.3	4.6
NX RN2126-1ctpc	1.05	28.1	5.5
NX RN00513	1.15	32.2	5.0
NX RN00516	1.15	32.3	5.2
NX RN00519	1.08	32.2	4.7
JaJo 8185	1.11	29.8	5.0
Syngenta N 2387C	1.10	29.9	5.1
TAMU -MAR-280K-1-98	1.07	30.0	5.7
NX RN00526	1.17	29.3	4.4
Syngenta N 2108ss	1.07	30.0	5.0
DPL-SureGrow 747	1.13	28.7	5.2
DPL-SureGrow-215B/RR	1.08	27.2	5.2
JaJo 8098	1.07	30.2	5.0
DPL 99Q85B	1.13	32.8	5.2
TAMU 1985FCx84-11	1.02	30.0	5.5
NX 2622ct	1.12	31.9	4.7
TAMU 96WD-22	1.15	29.9	4.6
Stoneville 474	1.11	31.1	5.1
MSU 8806-3-2-35	1.07	30.1	5.2
NX C429-93-4ct	1.13	33.8	5.1
TAMU 96WD-81	1.09	29.2	5.1
DPL 00V32	1.13	30.6	5.0
Fibermax 832	1.20	34.4	4.7
MSU 8806-3-2-21	1.09	29.6	5.1
Phytogen PSC 355	1.09	31.8	5.3
TAMU- CA 3066/M-315	1.06	31.4	5.4
TAMU- MAR-280L-2-98	1.11	33.1	4.7
Fibermax 958	1.16	34.7	4.8