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Host Suitability of Soybean Cultivars and Breeding Lines to Reniform Nematode in Tests Conducted in 2001[1]

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Abstract: Reproduction of reniform nematode *Rotylenchulus reniformis* on 139 soybean lines was evaluated in a greenhouse in the summer of 2001. Cultivars and lines (119 total) were new in the Arkansas and Mississippi Soybean Testing Programs, and an additional 20 were submitted by C. Overstreet, Louisiana State Extension Nematologist. A second test of 32 breeding lines and 2 cultivars from the Clemson University soybean breeding program was performed at the same time under the same conditions. Controls were the resistant cultivars Forrest and Hartwig, susceptible Braxton, and fallow infested soil. Five treatment replications were planted in sandy loam soil infested with 1,744 eggs and vermiform reniform nematodes, grown for 10 weeks in 10 cm-diam.-pots. Total reniform nematodes extracted from soil and roots was determined, and a reproductive factor (final population (Pf)/ initial inoculum level (Pi)) was calculated for each genotype. Reproduction on each genotype was compared to the reproduction on the resistant cultivar Forrest (RF), and the log ratio [$\log_{10}$(RF + 1) is reported. Cultivars with reproduction not significantly different from Forrest (log ratio) were not suitable hosts, whereas those with greater reproductive indices were considered suitable hosts. These data will be useful in the selection of soybean cultivars to use in rotation with cotton or other susceptible crops to help control the reniform nematode and to select useful breeding lines as parent material for future development of reniform nematode resistant cultivars and lines.

Key words: breeding lines, cultivars, *Glycine max*, nematode, reniform nematode, reproductive index, rotation, *Rotylenchulus reniformis*, soybean.

A number of soybean (*Glycines max*) cultivars and breeding lines have been tested in recent years for their susceptibility to the reniform nematode (*Rotylenchulus reniformis*). Robbins et al. (1994) reported on reproduction of the reniform nematode on 30 soybean cultivars. Robbins and Rakes (1996) reported on 16 soybean cultivars, 45 germplasm lines, 2 cultivars (Hartwig, Cordell) with resistance from PIs 437654 and 90763, respectively, and the differentials used in the soybean cyst nematodes race determination tests. Robbins et al. (1999) reported on 282 soybean cultivars and lines from the Arkansas and Mississippi Soybean Variety Testing programs, and Robbins et al. (2000) reported on 226 cultivars from the Arkansas and Mississippi Soybean Variety Testing programs, and cultivars submitted by extension nematologists from Auburn and Louisiana State University. Robbins et al. (2001) reported on 115 cultivars from the Arkansas and Mississippi Soybean Variety Testing programs and three cultivars submitted by a Texas extension nematologist. These reports form the basis for reniform nematode reproduction information on contemporary soybean lines. They show a reduction in number of genotypes with low reproductive indices from ca. 17% in the early 1990s to ca. 4% in the 2000 tests. With the decrease in reproductive indices there was also the loss of a discernible gap between cultivars with low reproductive indices and those with intermediate to high reproductive indices.

Reproduction of reniform nematode *Rotylenchulus reniformis* on 139 soybean lines was evaluated in 2001; 119 were new in the Arkansas and Mississippi Soybean Testing programs; and 20 were submitted by C. Overstreet, Louisiana State Extension Nematologist. A second test of 32 breeding lines and 2 cultivars from the Clemson University soybean breeding program was performed concurrently, but separately under the same conditions. The objectives of the studies were to: (i) identify new soybean cultivars that are poor hosts for the reniform nematode that would be useful in rotation with cotton or other reniform nematode susceptible crops in reniform nematode infested fields and, (ii) identify useful breeding lines for use in development of reniform nematode resistant cultivars.

Materials and Methods

The 139 soybean genotypes were from both private and public sources, whereas the 32 breeding lines and two cultivars were from the Clemson University Soybean breeding program. Seeds of all cultivars were germinated in vermiculite and transplanted into 10-cm-diam. clay pots containing 500 cm^3 of pasteurized fine sandy loam soil (ca. 91% sand, 5% silt, 4% clay, <1% O.M.). Infestation nematodes from the same source as used in the 1998, 1999, and 2000 tests were obtained by washing the soil from the roots of the susceptible cultivar Braxton grown in the greenhouse for at least 10 weeks. suspending the nematodes in water, and pouring the nematode suspension through nested 850- and 38-µm-pore sieves. The material on the 38-µm-pore sieve was placed on a tissue in a Baermann funnel. All vermiform stages of *R. reniformis* were collected after 16 hours. On the same day a total of 1,744 eggs and vermiform reniform nematodes were injected with an au-

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TABLE 1. Reproduction of *Rotylenchulus reniformis* on 139 selected soybean cultivars and lines in 2001.

Cultivar or line	Total reniform nematodes/pot[2]	RI[3]	RF[4]	Log_{10} mean RF[5]	Log ratio[6]
Fallow	1,140	0.65	0.13	0.13*	0.05**
Hartwig	3,132	1.80	0.36	0.34*	0.13**
Forrest	8,794	5.04	1.00	1.00*	0.30**
AgriPro/Garst 6612RRN	9,293	5.33	1.06	0.99*	0.30**
Triumph TR4810RR	19,250	11.04	2.19	1.89*	0.46**
Armor 56-J6	28,536	16.36	3.25	2.93*	0.59
Vigoro V462NRS	31,500	18.06	3.58	3.24*	0.63
Terral TV5666RR (L)[7]	31,580	18.11	3.59	3.29*	0.63
USG Exp570	32,202	18.46	3.66	3.24*	0.63
Pioneer 94B23	32,946	18.89	3.75	2.92*	0.59
Delta King XTJ193RR	35,060	20.10	3.99	3.94*	0.69
S39-Q4	36,777	21.09	4.18	3.70*	0.67
Hartz H4554RR	37,932	21.75	4.32	3.84*	0.69
Dyna-Gro 3518NRR	40,378	23.15	4.59	3.85*	0.69
Willcross RR2549N	43,310	24.83	4.93	4.38*	0.73
Terral TVX56R001	48,416	27.76	5.51	3.64*	0.67
Terral TVX5R400	49,564	28.42	5.64	4.43*	0.74
Armor 53-K3	50,866	29.17	5.79	5.31*	0.80
FFR 4900RR	51,754	29.68	5.89	4.76*	0.76
Pioneer variety 9492 (L)	53,802	30.85	6.12	4.76*	0.76
South States SS-RT517N	56,604	32.46	6.44	5.47*	0.81
Dixie 4803RR	57,560	33.00	6.55	6.06*	0.85
Dyna-Gro 3543NRR	58,080	33.30	6.61	5.78*	0.83
Delta King XTJ184RR	59,828	34.31	6.81	5.54*	0.82
Hornbeck HBKR5920 (L)	60,212	34.53	6.85	5.23*	0.79
Asgrow AG4902 (L)	63,356	36.33	7.21	5.84*	0.83
Morsoy RT5620N	64,382	36.92	7.32	5.98*	0.84
HBK R5620	65,268	37.42	7.43	5.90*	0.84
S99-2607RR	65,960	37.82	7.50	6.89*	0.90
Asgrow AG4602 (L)	66,359	38.05	7.55	6.61*	0.88
Armor 47-G7	66,524	38.14	7.57	5.12*	0.79
ES Ranger RR	67,354	38.62	7.66	6.52*	0.88
Armor 54-Z4	69,895	40.08	7.95	6.93*	0.90
Hartz variety H4998RR (L)	69,928	40.10	7.96	5.74*	0.83
Croplan Gen RC3866	70,656	40.51	8.04	6.81*	0.89
Terral TVX58R001	70,842	40.62	8.06	6.16*	0.85
Terral TVX54R001	71,740	41.14	8.16	7.47*	0.93
Hartz HX38-92955	71,888	41.22	8.18	7.80*	0.94
AgriPro/Garst 588RR (L)	71,999	41.28	8.19	3.87*	0.69
Croplan Genetics YRC51	73,486	42.14	8.36	5.96*	0.84
Delta King XTJ203RR	73,882	42.36	8.41	6.81*	0.89
Pioneer variety 95B53 (L)	74,444	42.69	8.47	5.63*	0.82
Terral TVX5R800	74,921	42.96	8.52	4.47*	0.74
HBK R5420	74,988	43.00	8.53	7.57*	0.93
AgriPro/Garst 5512RRN	75,620	43.36	8.60	7.66*	0.94
Terral TVX5R900	76,236	43.71	8.67	7.54*	0.93
Terral TV59R98	76,386	43.80	8.69	7.29*	0.92
Croplan Gen RT4241	76,640	43.94	8.72	7.71*	0.94
Delta King 3961RR	76,860	44.07	8.74	6.42*	0.87
Willcross RR2520N	78,060	44.76	8.88	6.53*	0.88
South States SS-RT5001N	78,176	44.83	8.89	6.28*	0.86
Terral TVX5R600	78,559	45.05	8.94	6.78*	0.89
Pioneer 94B73	79,939	45.84	9.09	6.80*	0.89
Hartz H5444RR	80,585	46.21	9.17	6.53*	0.88
S46-G2	81,460	46.71	9.27	8.84	0.99
Delta Grow 4950RR	82,060	47.05	9.34	8.46	0.98
Croplan Gen RC3838	82,520	47.32	9.39	8.52	0.98
Willcross RR2590NSTS	83,180	47.69	9.46	7.98	0.95
Progeny 4858	83,275	47.75	9.47	6.55*	0.88
Dyna-Gra 3600NRR (L)	83,422	47.83	9.49	8.22	0.96
AgriPro/Garst 4501RRN	83,852	48.08	9.54	6.96*	0.90
HBK XR490-01	84,920	48.69	9.66	8.21	0.96
Willcross RR2517N	85,360	48.94	9.71	9.36	1.02
Asgrow AG3903	87,546	50.20	9.96	8.28	0.97
USG 540NRR	87,860	50.38	10.00	8.64	0.98
Croplan Gen YRC49	88,886	50.97	10.11	6.56*	0.88

TABLE 1. *Continued*

Cultivar or line	Total reniform nematodes/pot[2]	RI[3]	RF[4]	Log_{10} mean RF[5]	Log ratio[6]
HBK 5992	88,997	51.03	10.13	8.19	0.96
South States SS5200STS	90,714	52.01	10.32	7.52*	0.93
USG 510NRR	90,967	52.16	10.35	6.05*	0.85
Vigoro V552NRR	92,492	53.03	10.52	8.38	0.97
Asgrow AG5701 (L)	94,316	54.08	10.73	8.16	0.96
Asgrow AG3702	94,533	54.20	10.75	7.62*	0.94
AgriPro/Garst 4512RRN	94,792	54.35	10.78	7.42*	0.93
SS RT 557N (L)	94,852	54.39	10.79	7.36*	0.92
Dyna-Gro 3582NRR	95,640	54.84	10.88	9.64	1.03
HBK XR441-01	97,066	55.66	11.04	7.28*	0.92
Delta King XTJ183RR	97,324	55.81	11.07	8.84	0.99
HBK R4820	97,760	56.06	11.12	8.85	0.99
Croplan Genetics RC5454	98,060	56.23	11.16	8.51	0.98
Croplan Genetics YRC58	99,370	56.98	11.31	9.67	1.03
Armor 59-B9	99,640	57.13	11.34	8.77	0.99
Deltapine DP 5915RR (L)	99,868	57.26	11.36	8.96	1.00
EKXP 4855	100,476	57.61	11.43	8.60	0.98
Delta King XTJ174RR	101,160	58.00	11.51	8.56	0.98
Delta King XTJ202RR	104,458	59.90	11.88	8.45	0.98
AgriPro/Garst 4602RR (L)	104,480	59.91	11.89	9.46	1.02
DT97-4290	106,164	60.87	12.08	11.12	1.08
DT96-6840	107,960	61.90	12.28	9.88	1.04
Croplan Genetics RC5252	108,186	62.03	12.31	10.63	1.07
EKXP 4901RR	112,242	64.36	12.77	8.87	0.99
Delta King XTJ124RR	113,940	65.33	12.96	10.64	1.07
Croplan Genetics YRC57	114,777	65.81	13.06	10.77	1.07
Delta King XTJ204RR	115,264	66.09	13.11	9.29	1.01
Dyna-Gro 3600NRR	115,430	66.19	13.13	9.18	1.01
Croplan Gen RC4995	116,380	66.73	13.24	10.78	1.07
Deltapine DPX 4300RR	116,820	66.98	13.29	12.35	1.13
Progeny 5415RR	118,429	67.91	13.24	9.78	1.03
Asgrow AG5901 (L)	118,520	67.96	13.48	10.96	1.08
Delta King 3964RR	118,613	68.01	13.49	9.60	1.03
NK Brand S51-T1-RR (L)	118,724	68.08	13.51	10.40	1.06
ES Trooper RR	119,880	68.74	13.64	11.39	1.09
Asgrow AG5603	120,802	69.27	13.74	8.91	1.00
HBK R5820	121,028	69.40	13.77	8.85	0.99
Deltapine DP5110S	121,648	69.75	13.84	8.94	1.00
Pioneer 93B67	123,022	70.54	14.00	9.03	1.00
Asgrow AG3503	125,956	72.22	14.33	10.73	1.07
SS-RT 446N	126,300	72.42	14.37	11.81	1.11
Croplan Genetics YRC56	130,460	74.81	14.84	11.75	1.11
Vigoro V622NRR	131,500	75.20	14.92	11.31	1.09
Pioneer 95B96	131,500	75.40	14.96	13.11	1.15
Dyna-Gro 3443NRR	132,500	75.97	15.07	12.10	1.12
Armor 42-L2	132,753	76.12	15.10	11.24	1.09
Deltapine DP5414RR	133,420	76.50	15.18	12.25	1.12
Willcross RR2569N	134,712	77.24	15.33	9.69	1.03
Willcross RR2580N	138,060	79.16	15.71	10.36	1.06
Hornbeck HBKR60020 (L)	138,908	79.65	15.80	10.97	1.08
Asgrow AG6201 (L)	142,724	81.84	16.24	11.80	1.11
Croplan Gen RC4444	142,880	81.93	16.26	13.93	1.17
Deltapine DPX 4885RR	143,360	82.20	16.31	11.94	1.11
Delta King XTJ201RR	144,660	82.95	16.46	12.61	1.13
NK Brand S59-V6-RR (L)	151,840	87.06	17.27	15.59	1.22
HBK X550-01	153,440	87.98	17.46	14.39	1.19
Delta Grow 5600	153,789	88.18	17.50	13.23	1.15
Armor 44-R4	154,983	88.87	17.63	12.31	1.12
Delta King XTJ205RR	158,800	91.06	18.07	10.30	1.05
Hartz HX40-93038	158,966	91.15	18.09	10.36	1.06
S99-2448RR	161,698	92.72	18.40	13.91	1.17
S58-R3	165,520	94.91	18.83	16.77	1.25
ES Marshal RR	167,600	96.10	19.07	17.12	1.26
SG 498 RR (L)	168,860	96.82	19.21	15.25	1.21
Pioneer 95B97	174,040	99.79	19.80	15.85	1.23
AgriPro/Garst XR0162N44	175,740	100.77	19.99	15.97	1.23

TABLE 1. *Continued*

Cultivar or line	Total reniform nematodes/pot[2]	RI[3]	RF[4]	Log_{10} mean RF[5]	Log ratio[6]
SS-RT 4098	178,529	102.37	20.31	18.41	1.29
Asgrow AG4301	182,380	104.58	20.75	17.17	1.26
USG 7489RR	186,040	106.67	21.17	17.96	1.28
S52-U3	191,240	109.66	21.76	18.34	1.29
Hartz variety H5999 RR (L)	201,180	115.36	22.89	20.80	1.34
S99-2447RR	204,068	117.01	23.22	13.81	1.17
Deltapine DP5989	207,688	119.09	23.63	15.81	1.23
Braxton	220,860	126.64	25.13	21.24	1.35
HBK SB3980RR	228,220	130.86	25.96	22.05	1.36
ES Punch RR	229,908	131.83	26.16	17.72	1.27
HBK 5812	267,040	153.12	30.38	25.82	1.43
LSD to compare any pair of cultivars =				11.54	0.40

[1] = Inoculated with 1,744 vermiform reniform nematodes on 10 July. The test was harvested 10 September.
[2] Total eggs + vermiform reniform nematodes/pot.
[3] RI (reproductive index) = final reniform population/initial reniform population (Pf/Pi).
[4] RI/RI of Forrest.
[5] Mean RF from log-transformed data. Cutoff for log ratios being significantly larger than 1 (Forrest) is 7.84 (*).
[6] Log ratio of RF from transformed data ($\log_{10}$[RF + 1]). RF of Forrest = 1. $\log_{10}(1 + 1) = 0.301$. Cutoff for log ratios being significantly larger than 1 (RF of Forrest) is 0.540 (**).
[7] (L) = cultivar entry from Louisiana.

topipet into three 2.5-cm-deep holes made in the soil around each seedling in the cotyledon stage, one seedling per pot. Pots were arranged in a randomized complete-block design with five replications per cultivar. Soybean cultivars Forrest and Hartwig were included as resistant controls and Braxton as a susceptible control. Reniform nematode-infested fallow soil was included as a survival baseline control in the absence of a host. The experiment was conducted in a greenhouse with the ambient temperature maintained at 28 to 34°C. All pots were watered at least twice daily (8 a.m. and 4 p.m.) and other times, if needed, and fertilized each week with 20-20-20 (N-P-K) fertilizer.

After 10 weeks (July 7–September 15), the number of reniform nematode eggs and vermiform nematodes contained in egg masses on the roots and the numbers of vermiform nematodes in the soil of each pot were determined. The eggs and vermiform nematodes in the egg masses on roots were extracted with 0.525% NaOCl (Hussey and Barker, 1973) and counted. To calculate the final reniform nematode soil population (Pf), a 100-cm^3 aliquot of well-mixed soil from each pot was suspended in water and poured through nested 850- and 38-µm-pore sieves to remove plant debris and extract the nematodes. Nematodes caught on the 38-µm-pore sieve were separated from soil by sucrose centrifugal-flotation (Jenkins, 1964), counted, and multiplied by 5 to give the number per pot. The total number of reniform nematode eggs and vermiform nematodes per pot was calculated by adding the number from the soil to the number from the roots. A reproductive index (RI), defined as the number of eggs + vermiform nematodes at test termination (Pf)/initial infestation level (Pi), was calculated for each genotype. In addition, the ratio of the RI of each genotype to the RI of Forrest (RF), and the log ratio [$\log_{10}$(RF + 1)], were analyzed as a randomized complete block using analysis of variance. Log-ratio transformations were used because of the high degree of variation in nematode counts within a genotype. Genotype means were separated using a protected LSD at $P = 0.05$, where appropriate. Genotypes were considered suitable hosts if their mean log ratio was significantly higher than that of Forrest ($\log_{10}(2) \cong 0.301$); thus, genotypes were considered suitable hosts at log ratios higher than 0.540 ($P = 0.05$) for the 139 cultivars and 0.48 ($P = 0.05$) for the Clemson 32 breeding lines and two cultivars. All statistical analyses were carried out using SAS version 8 (SAS Institute, Cary, NC).

RESULTS

In the test from new cultivars from the Arkansas and Mississippi variety testing programs and those submitted from Louisiana, two cultivars had log ratios not significantly higher than Forrest ($\log_{10}(2) = 0.301$), namely AgriPro/Garst 6612RRN (0.300) and Triumph TR4810RR (0.46). The log ratio of the remaining 137 cultivars ranged from 0.59 to 1.43 (Table 1). The log ratio for Hartwig was 0.13, whereas that of the fallow treatment was 0.05. In the Clemson test, eight breeding lines and the cultivars Santee and Motte had log ratios not significantly higher than Forrest ($\log_{10}(2) = 0.301$) (Table 2). The log-ratio data, which reduces the effects of variation, were considered more reliable than RF because of the high degree of variation in RF. The $\log_{10}$ mean RF data are also included in Tables 1 and 2, and these data indicate that 29 cultivars are not significantly better hosts than Forrest for the Arkansas cultivars. The data were similar for the Clemson breeding lines, with only one line (SC98-1063) not a significantly better host based on the RF data than the log-ratio data.

TABLE 2. Reproduction of *Rotylenchulus reniformis* on 32 breeding lines and 2 cultivars from the Clemson breeding program in 2001.[1]

Line	Total reniform nematodes/pot[2]	RI[3]	RF[4]	Log_{10} mean RF[5]	Log ratio[6]
Fallow	756	0.43	0.16	0.15*	0.06**
SC95-1070	2,129	1.22	0.45	0.44*	0.16**
SC98-249	2,186	1.25	0.46	0.44*	0.16**
Hartwig	2,750	1.58	0.58	0.56*	0.19**
SC94-1573	3,146	1.80	0.67	0.66*	0.22**
SC97-259	3,665	2.10	0.78	0.74*	0.24**
SC95-771	3,893	2.23	0.83	0.80*	0.26**
SANTEE	4,032	2.31	0.86	0.83*	0.26**
Forrest	4,709	2.70	1.00	1.00*	0.30**
MOTTE	6,163	3.53	1.31	1.23*	0.35**
SC97-1770	8,436	4.84	1.79	1.73*	0.44**
SC98-353	10,401	5.96	2.21	1.68*	0.46**
SC98-318	14,371	8.24	3.05	2.01*	0.48**
SC98-1063	47,740	27.37	10.14	9.43*	1.02
SC98-635	66,740	38.27	14.17	11.60	1.10
SC96-1624	82,380	47.24	17.49	14.76	1.20
SC96-1628	83,707	48.00	17.78	16.78	1.25
SC96-1574	85,840	49.22	18.23	16.88	1.25
SC98-1181	89,420	51.27	18.99	15.47	1.22
SC98-101	89,686	51.43	19.05	11.75	1.11
SC98-469	118,340	67.86	25.13	22.22	1.37
SC98-1108	122,447	70.21	26.00	22.93	1.38
CS97-1746	133,180	76.36	28.28	27.15	1.45
SC97-1764	133,860	76.75	28.43	21.31	1.35
SC97-2010	135,420	77.65	28.76	21.35	1.35
SC98-679	136,360	78.19	28.96	27.68	1.46
SC98-1427	153,840	88.21	32.67	30.71	1.50
SC96-1476	165,420	94.85	35.13	29.11	1.48
SC95-988	175,320	100.53	37.23	34.32	1.55
SC98-1279	184,020	105.52	39.08	35.51	1.56
SC96-1688	190,580	109.28	40.47	37.02	1.58
SC96-2736	194,520	111.54	41.31	36.42	1.57
Braxton	198,260	113.68	42.10	39.12	1.60
SC98-81	212,080	121.61	45.04	39.85	1.51
SC98-888	229,100	131.36	48.65	37.65	1.59
SC98-1428	240,540	137.92	51.08	41.85	1.63
SC94-1075	264,680	151.77	56.21	48.34	1.69
SC93-1963	537,720	308.33	114.19	86.18	1.94
LSD to compare any pair of cultivars =				21.72	0.30

[1] = Inoculated with 1,744 vermiform reniform nematodes.
[2] Total eggs + vermiform reniform nematodes/pot.
[3] RI (reproductive index) = final reniform population/initial reniform population (Pf/Pi).
[4] RI/RI of Forrest.
[5] Mean RF from log-transformed data. Cutoff for log ratios being significantly larger than 1 (Forrest) is 13.86 (*).
[6] Log ratio of RF from transformed data (log_{10}[RF + 1]). RF of Forrest = 1. $Log_{10}(1 + 1) = 0.301$. Cutoff for log ratios being significantly larger than 1 (RF of Forrest) is 0.480 (**).

DISCUSSION

In the early 1990s 5 of 30 cultivars tested (ca. 17%) were reported as resistant to the reniform nematode and there was an easily discernible gap between the RI of the resistant cultivars and the intermediate and susceptible cultivars (Robbins et al., 1994). In 2000 tests, only 5 of 118 genotypes (ca. 4%) did not support significantly more reniform nematodes than the resistant check Forrest and there was no discernible gap in RI (Robbins et al., 2001). This decrease in the number of genotypes with low RI for reniform nematode is likely due to the almost exclusive use of PI 88788 as the resistance source for soybean cyst resistance in Northern varieties (ca. 97% in maturity groups 4 to 0) and predominant source in Southern cultivars (ca. 68% in maturity groups 4 or 8), replacing Peking as the main resistance source in recent years (from data presented at the National Soybean Cyst Nematode Conference, 16–17 July 2002). Robbins, et al. (1996) reported PI 88788 as susceptible to the reniform nematode.

The similar results for the Clemson breeding lines in the RF and log-ratio data are likely because the breeding lines are more homogeneous in their capability to host the reniform nematode than were many of the Arkansas cultivars. Several of the Arkansas test cultivars gave mixed results, with some pots exhibiting high reniform reproduction and others revealing low or intermediate reproduction. Variation in host status within a cultivar was, in part, possibly due to the chance introduction of outside genes during mass seed production used before releasing the cultivar, whereas the lesser variation in reniform reproduction in the breeding lines, in part, is likely due to the uniformity resulting from small plots and the elimination of off types.

The main objective of these tests was to identify soybean cultivars and breeding lines with low reniform nematode RI. Only two new cultivars in the Arkansas-Mississippi variety testing programs had reniform nematode reproduction comparable to that of the resistant cultivar Forrest. These cultivars, as well as those identified with low RI in previous tests (Robbins et al., 1994, 1996, 1999, 2000, 2001), may be important for use in rotation with cotton in fields with large numbers of the reniform nematode, whereas the breeding lines with low RI may be useful in the development of new cultivars.

Due to time constraints, the tests were not repeated. Contemporary private soybean cultivars generally have a short life in the seed market before they are replaced with new cultivars that are higher yielding or have a superior disease resistance package. It is our opinion that timely reporting the reproductive indices for reniform nematode outweighs repeating the tests.

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