



# Reniform Nematode Reproduction on Soybean Cultivars and Breeding Lines in 2011



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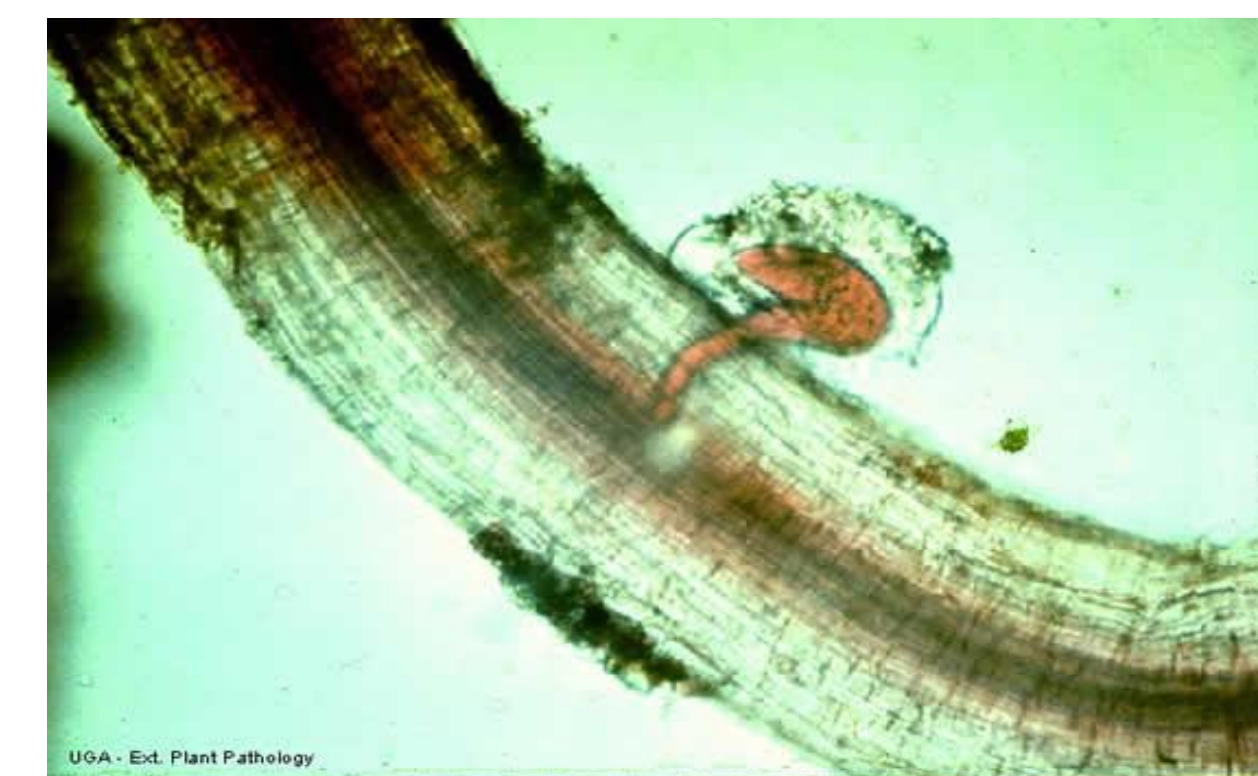
## ABSTRACT

During 2010, 161 soybean varieties from the Arkansas variety testing program , 64 breeding lines and varieties: 20 from Clemson (Shipe), 6 from Arkansas (Chen), 2 from the USDA Jackson TN (Arelli), 20 from the Missouri (Shannon), and 16 from Virginia Tech (Rainey) were tested in the greenhouse to determine their suitability as hosts for the reniform nematode, *Rotylenchulus reniformis*. All treatments were inoculated with 2,000 vermiform RN. The treatments were grown for 93 days. The RN resistant varieties Anand, Forrest, and Hartwig, the RN susceptible cultivar Braxton, and fallow Reniform nematode infested soil served as controls. The mean number of vermiform nematodes extracted from the soil of each treatment was calculated, as were the reproductive indices (RI = Pf/Pi), and PF/PI's of Anand, and Forrest for both tests. Arkansas test cultivars with RI's significantly greater than the RI on Anand (3.59) were considered suitable hosts for *R. reniformis*. Of the Arkansas test varieties 152 of 161 supported more reproduction than Forrest. The following varieties; (Armor) ARX492, (ASGROW) AG5431, (ASGROW) AG5531, (Hornbeck) HBK RY5520, (Missouri Line) S06-3053, (Missouri Line) S06-6053, (Midwest Premium Genetics) SSC-049N, (Midwest Premium Genetics) SSC-051N, and (UniSouth Genetics) USG 75T40 were not different than Anand. The Reniform Nematode did not reproduce more than on Anand on 11 of the 64 breeding lines and they may be of interest in Reniform nematode resistant soybean breeding programs. The lines that did not support more reproduction than Anand may be useful in a Cotton-Soybean Rotation to reduce the numbers of reniform nematodes and allow cotton to be grown economically.

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Reniform nematode infested cotton.



Reniform nematode on cotton root

## OBJECTIVES OF THIS STUDY WERE TO:

- 1) 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
- 2) Identify useful soybean breeding lines for use in selection of new reniform resistant cultivars.

## RESULTS:

Soybean varieties tested in 2008, 2009, and 2010 showing Reniform nematode resistance that could be of use in a Cotton-Soybean rotation.

2008	2009	2010
AgVenture AV 53D3NRR	DB04-10836	Armor ARX492
Armor 39-K4	DB04-10997	ASGROW AG5431
ASGROW AG 4705	MorSoy RT4919N	ASGROW AG5531
ASGROW AG 5606	Pioneer 95Y30	HBK RY5520
Eagle Seed ES 4818RR	V03-4705	SSC-049N
Eagle Seed ES 4906RR		SSC-051N
Eagle Seed ES 5121RR		USG 75T40
MPG 5308nRR		
Progeny 4508RR		

Table 2. *Rotylenchulus reniformis* reproduction on selected Breeding Lines in 2010 tests.

Breeding Line	Breeder	Cultivar Log + 1 Mean	Nematode Count Mean	Cultivar RI = Pf/Pi Mean	Breeding Line	Breeder	Cultivar Log + 1 Mean	Nematode Count Mean	Cultivar RI = Pf/Pi Mean
Fallow		0.28	1110	0.56	SC07-1027	Shipe	12.37	57800	28.90
S07-14903	Shannon	0.33	1308	0.65	V06-0613	Rainey	12.73	58100	29.05
S05-11400	Shannon	0.58	2340	1.17	RM1-1639	Chen	13.29	58300	29.15
S08-6800	Shannon	0.68	2760	1.38	MAXCY	Shipe	13.67	59900	29.95
S08-12102	Shannon	0.79	3264	1.63	S07-14472	Shannon	13.68	63200	31.60
S08-14910	Shannon	0.87	4540	2.27	GLENN 09	Rainey	13.69	82000	41.00
Hartwig	Resistant Check	0.93	3930	1.97	SANTEE	Shipe	13.999	56400	28.20
Anand	Resistant Check	1.00	3840	1.92	S08-7048	Shannon	14.314	100208	50.10
S07-14892	Shannon	1.09	5296	2.65	S07-18772	Shannon	14.411	65800	32.90
S07-11606	Shannon	1.56	7176	3.59	V06-1025	Rainey	15.547	78400	39.20
S08-17961	Shannon	1.90	10892	5.45	S08-10645	Shannon	15.959	68500	34.25
S07-14902	Shannon	2.03	9108	4.55	ARK 55	Chen	16.064	114396	57.20
V04-5842	Rainey	2.08	9532	4.77	B05-8046	Rainey	16.236	72500	36.25
SC98-1930	Shipe	2.38	14576	7.29	V05-2505	Rainey	16.308	85900	42.95
S08-18197	Shannon	3.16	18796	9.40	JTN-3109	Arelli	16.344	75100	37.55
JTN-5110	Arelli	3.95	20028	10.01	RM6-9508	Chen	17.76	73200	36.60
V03-4705	Rainey	6.12	31124	15.56	ARK 8109	Chen	17.89	81700	40.85
V95-0016	Rainey	6.13	25400	12.70	SC07-1352	Shipe	18.472	77600	38.80
V03-4661	Rainey	6.81	28000	14.00	SC07-1455	Shipe	18.528	85400	42.70
S08-4628	Shannon	7.86	45988	22.99	SC05-642	Shipe	19.038	80900	40.45
SC07-786	Shipe	7.89	36200	18.10	S08-14132	Shannon	19.178	87700	43.85
V06-0241	Rainey	8.41	33400	16.70	V06-0038	Rainey	19.23	102428	51.21
V06-0197	Rainey	8.56	40500	20.25	SC02-208	Shipe	20.149	84000	42.00
MOTTE	Shipe	9.33	44840	22.42	Braxton	Suscept Check	20.746	106000	53.00
Forrest	Resistant Check	9.35	46136	23.07	SC07-912	Shipe	20.904	90200	45.10
SC06-687	Shipe	9.58	42728	21.36	SC07-1518	Shipe	21.716	89600	44.80
V06-1045	Rainey	9.63	71216	35.61	SC06-676	Shipe	21.887	96100	48.05
Osage	Chen	9.83	65996	33.00	HAGOOD	Shipe	22.499	88300	44.15
SC07-1490	Shipe	9.96	52964	26.48	SC07-5206	Shannon	23.036	99400	49.70
S08-17357	Shannon	10.24	47880	23.94	SC07-1029	Shipe	23.402	99700	49.85
SC07-1596	Shipe	10.90	103832	51.92	SC07-150	Shipe	23.652	110700	55.35
S07-2680	Shannon	11.06	51700	25.85	ARK S1	Chen	26.918	104700	52.35
V03-4660	Rainey	11.41	82140	41.07	SC07-108	Shipe	29.858	117680	58.84
V06-0245	Rainey	11.82	61052	30.53	V06-1014	Rainey	29.941	164600	82.30
S08-14100	Shannon	12.21	56900	28.45					

RED not different that Hartwig and Anand.

Table 1. *Rotylenchulus reniformis* reproduction on 161 selected soybean cultivars and lines from the Arkansas Soybean Variety Testing Program in 2010 tests.

Cultivar	Cultivar Log + 1 Mean	Nematode Count Mean	Cultivar RI = Pf/Pi Mean	Cultivar	Cultivar Log + 1 Mean	Nematode Count Mean	Cultivar RI = Pf/Pi Mean	Cultivar	Cultivar Log + 1 Mean	Nematode Count Mean	Cultivar RI = Pf/Pi Mean
Fallow	0.05	960	0.48	SS-09L49N	1.33	232260	116.13	VP Maxx 44X1RR	1.54	407100	203.55
ASGROW AG5531	0.09	1680	0.84	Terral-REVTM 54R10	1.34	257500	128.75	ASGROW AG4531	1.54	256000	128.00
S06-3053	0.10	1968	0.98	Dyna-Gro 37RY52	1.35	247600	123.80	Croplan RC4749	1.54	266700	133.35
USG 75T40	0.10	1824	0.91	Progeny 5960LL	1.36	200600	100.30	Delta King DK5363	1.54	258000	129.00
Armor ARX492	0.10	1896	0.95	USG 74G99L	1.36	197400	98.70	HBK RY4620	1.55	360000	180.00
SSC-051N	0.11	2352	1.18	Croplan RC4417	1.37	249700	124.85	Progeny 5160LL	1.55	380800	190.40
Hartwig	0.13	2616	1.31	Delta King DKR4440	1.37	197500	98.75	Croplan RC4757S	1.55	302000	151.00
S06-6053	0.13	2748	1.37	Armor ARX1535	1.37	182300	91.15	Pioneer 94Y71	1.56	305800	152.90
Anand	0.33	7176	3.59	Stine 5400-4	1.38	183800	91.90	Dyna-Gro 34RY46	1.56	352480	176.24
ASGROW AG5431	0.34	29440	14.72	Progeny 4920RY	1.38	235100	117.55	Armor ARX1481	1.56	318500	159.25
SSC-049N	0.40	35136	17.57	Armor ARX1478	1.39	185100	92.55	Terral-REVTM 57R21	1.56	295840	147.92
HBK RY5520	0.48	29520	14.76	Delta King DKX1492	1.39	383800	191.90	Eagle Seed ES 4998	1.56	270000	135.00
Armor ARX1552	0.61	67224	33.61	Terral-REVTM 56R21	1.39	279200	139.60	MorSoy R2540	1.56	264000	132.00
Forrest	0.65	29872	14.94	Progeny 4810RY	1.39	198500	99.25	HBK RY4920	1.56	290320	145.16
Armor ARX1551	0.68	108084	54.04	Armor ARX1477	1.39	253700	126.85	Delta King DKX1540	1.57	326600	163.30
HBK R5529	0.70	47360	23.68	NK S49-AS Brand	1.39	275080	137.54	Terral-REVTM 55R21	1.57	409900	204.95
USG 75J50R	0.94	148696	74.35	VP Maxx 49C9RR	1.39	350468	175.23	Progeny 4960LL	1.57	315600	157.80
Terral-REVTM 54R21	0.95	66700	33.35	MorSoy R25481	1.4	245100	122.55	Terral-REVTM 49R22	1.58	387500	193.75
MorSoy R25480	1.04	97600	48.80	Armor ARX1471	1.4	248500	124.25	eMerge KC4910	1.59	512900	256.45
Delta King DKX1533	1.06	127600	63.80	NK S47-R3 Brand	1.4	214500	107.25	DB06-2257	1.59	322900	161.45
MorSoy R254800	1.09	154700	77.35	Progeny 4209RY	1.41	239700	119.85	Armor ARX1482	1.59	389500	194.75
Dyna-Gro 37RY47	1.13	291700	145.85	Willcross RR2507NS	1.41	226000	113.00	R04-572	1.59	414420	207.21
Delta King DKX1537	1.15	170544	85.27	Delta King DKR4744	1.41	216700	108.35	SS-10L51N	1.6	319000	159.50
Progeny 4750RR	1.15	185480	92.74	Armor ARX1536	1.42	508800	254.40	Delta Grow 4880RR	1.61	331000	165.50
Progeny 5610RY	1.16	151140	75.57	S07-5151	1.42	311700	155.85	Willcross RY2460S	1.61	356000	178.00
eMerge XP4520	1.18	299220	149.61	Dyna-Gro 35RY47	1.42	258400	129.20	Dyna-Gro 5X10354L	1.61	388400	194.20
HBK RY5220	1.18	241744	120.87	S07-5117	1.43	299100	149.55	HBKR4924	1.62	302000	151.00
Terral-REVTM 44R22	1.19	119500	59.75	Progeny 5310RY	1.43	244280	122.14	V03-3650	1.62	413700	206.85
Delta King DKX1473	1.19	159300	79.65	Eagle Seed ES 5190RR2	1.43	247000	123.50	Davis 247RRS	1.62	410400	205.20
Willcross RR2878NS	1.20	296152	148.08	ASGROW EXP948R2	1.43	193300	96.65	Terral-REVTM 49R11	1.62	330000	165.00
SS-11L48N	1.20	174228	87.11	Progeny 4510RY	1.44	234600	117.30	Armor ARX1532	1.63	350000	175.00
ASGROW AG4630	1.20	133100	66.55	ASGROW AG5331	1.45	221200	110.60	Willcross RY2481S	1.63	335480	167.74
MorSoy R2491	1.20	167100	83.55	Armor 46-N7	1.45	470516	235.26	NK S44-D5 Brand	1.65	393000	196.50
Armor ARX1472	1.20	140200	70.10	Terral-REVTM 45R10	1.45	354100	177.05	MPG 4611NRR/STS	1.66	360000	180.00
Delta Grow 4795RR2	1.21	176000	88.00	Progeny 4610RY	1.46	275800	137.90	MorSoy R2521	1.66	462200	231.10
Eagle Seed ES 5390RR2	1.21	282656	141.33	Progeny 5330RR	1.46	298200	149.10	NK S56-G6 Brand	1.66	370000	185.00
HBK RY5820	1.25	170600	85.30	Progeny 5110RY	1.46	281560	140.78	R05-235	1.66	350800	175.40
MPG 4707NRR/STS	1.25	203232	101.62	USG 75J10R	1.47	345900	172.95	AgVenture AV48A8RR	1.66	397000	198.50
NK S46-U6 Brand	1.25	173600	86.80	USG 75J90R	1.48	301200	150.60	S07-15722	1.67	557600	278.80
MorSoy R254629	1.25	209800	104.90	Armor 47-G10	1.48						