Field performance of forty-three soybean varieties against the southern root-knot nematode, 2021

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The southern root-knot nematode (SRKN) *Meloidogyne incognita* is the most important, yield-limiting plant-pathogenic nematode in soybean in the south-central U.S. SRKN is widely distributed and found in most soybean-producing counties in Arkansas. Grain yield losses can be significant (>75%) when a susceptible variety is grown in a field with a high population of SRKN. During the 2021 cropping season, the Lonoke Extension Plant Pathology program selected 43 soybean varieties to evaluate in an SRKN infested field. The experiments were divided into four groups based on maturity group and herbicide traits. Varieties were planted in a randomized complete block design with four replications per entry. Plots were planted on 27 May at a seeding rate of 150,000 seeds/ac following corn in a silt or silt loam soil near Kerr, AR. Six roots were arbitrarily sampled from non-harvest rows of each plot to determine percent root galling at the R5 growth stage. Based on the percent root system galled soybean, varieties with <4% galling are resistant whereas those with >20% are susceptible. These results and those on the UA variety testing website can be helpful for variety selection for the 2022 cropping season.

Similar reports as this from previous years (2017 to 2020) are located at UADA CES Plant Disease Management Publications.

What else is important: These experiments were conducted in silt to silt loam soils. The number of nematodes to cause a similar magnitude of galling will be fewer in sandy loam to loamy sand soils and thus, a greater magnitude of susceptibility is likely in sandy loam to loamy sand soils with a similar population of SRKN.

Table 1. Field performance of 12 Roundup Ready, Enlist, and Xtend MG IV soybean varieties in a southern root-knot nematode infested field. Soil texture was a silt loam soil (16% sand, 74% silt, and 10% clay). (Pf (final population sampled at harvest) = 260 J2/100cm^3 of soil).

Variety	Percent root system galled[a]	Yield (bu/A)
Delta Grow DG4940	4.6 d[b]	63.2 a
Progeny P4431E3	5.0 d	63.2 a
Armor EN21E42	6.1 d	60.1 ab
Pioneer P46A35X	5.4 d	60.0 ab
Delta Grow DG46E10	5.4 d	59.9 ab
Delta Grow DG49E90	13.5 cd	59.0 ab
Pioneer P43A42X	5.9 d	53.7 a
Local Seed LS 4506XS	28.1 bc	50.3 b
Syngenta NKS48-2E3S	43.3 ab	27.2 c
Delta Grow DG4880 (Susc. Check)	56.8 ab	21.8 c
Armor EX4821X	72.5 a	21.7 c
Armor EN4221X	63.8 a	19.1 c

[a] Data are averages of four replications. Averages followed by a different letter within each column are significantly different at $\alpha = 0.05$ according to Tukey's HSD.

[b] Susceptibility based on percent of root system galled: 0-1.0 = very resistant, 1.1-4.0 = resistant, 4.1-9.0 = moderately resistant, 9.1-20.0 = moderately susceptible, 20.1-40.0 = susceptible, 40.1-100.0 = very susceptible.

Table 2. Field performance of 13 Roundup Ready, Enlist, and Xtend MG IV soybean varieties in a southern root-knot nematode infested field. Soil texture was a silt loam soil (12% sand, 77% silt, and 12% clay). (Pf = 256 J2/100cm^3 of soil).

Variety	Percent root system galled[a]	Yield (bu/A)
Pioneer P43A42X	2.3 d[b]	59.2 a
Agri Gold G4881E3	12.9 a-d	57.2 a
Armor EN21E49	8.7 bcd	54.4 a
Petrus Seed 4916GT	6.3 cd	52.8 a
Progeny P4444RKS	14.6 a-d	50.8 ab
Dyna Gro S48X40	18.3 abc	50.2 ab
Syngenta NKS44-2E3	20.3 abc	49.1 ab
Delta Grow DG48E28	21.0 abc	48.2 ab
Syngenta NKS45-J3X	42.2 a	47.2 ab
Syngenta S46-E3S	20.1 abc	45.1 ab
Delta Grow DG47E80	41.7 a	36.5 bc
Armor EX4121X	35.8 ab	28.6 c
Delta Grow DG4880 (Susc. Check)	44.7 a	28.2 c

[a] Data are averages of four replications. Averages followed by a different letter within each column are significantly different at $\alpha = 0.05$ according to Tukey's HSD.

[b] Susceptibility based on percent of root system galled: 0-1.0 = very resistant, 1.1-4.0 = resistant, 4.1-9.0 = moderately resistant, 9.1-20.0 = moderately susceptible, 20.1-40.0 = susceptible, 40.1-100.0 = very susceptible.

Table 3. Field performance of 15 Roundup Ready, Enlist, and Xtend MG V soybean varieties in a southern root-knot nematode infested field. Soil texture was a silt loam soil (23% sand, 73% silt, and 4% clay). (Pf = 251 J2/100cm^3 of soil).

Variety	Percent root system galled[a]	Yield (bu/A)
Pioneer P53A74BX	5.7 cd[b]	74.8 a
Pioneer P52A05X	2.6 d	72.1 ab
Pioneer P54A54X	6.7 cd	69.3 abc
Pioneer P55A49X	8.6 cd	65.8 a-d
Progeny P5424XF	7.0 cd	65.4 a-d
Syngenta S55-Q3	3.4 d	65.0 a-d
Syngenta NKS61-M2X	8.0 cd	63.7 a-d
Progeny P5604XF	9.8 cd	62.7 a-d
Progeny P5554RX	5.8 d	61.6 a-d
Local Seed LS 5418XFS	13.8 bcd	59.4 bcd
Delta Grow DG50E10	10.3 cd	56.6 cd
Stine 50EA22	10.8 cd	56.6 cd
Syngenta S51-E3	21.6 abc	54.6 d
Delta Grow 5170 (Susc. Check)	59.9 a	29.7 e
Delta Grow 5170 (Susc Check)	52.7 ab	27.3 e

[a] Data are averages of four replications. Averages followed by a different letter within each column are significantly different at $\alpha = 0.05$ according to Tukey's HSD.

[b] Susceptibility based on percent of root system galled: 0-1.0 = very resistant, 1.1-4.0 = resistant, 4.1-9.0 = moderately resistant, 9.1-20.0 = moderately susceptible, 20.1-40.0 = susceptible, 40.1-100.0 = very susceptible.

Table 4. Field performance of 3 Liberty and Enlist soybean varieties in a southern root-knot nematode infested field. Soil texture was a silt soil (8% sand, 86% silt, and 6% clay). (Pf = 169 J2/100cm^3 of soil).

Variety	Percent root system galled[a]	Yield (bu/A)
Pioneer P52A43L	0.1 b[b]	74.1 a
Pioneer P45A29L	2.8 ab	65.9 a
Delta Grow DG47E80 (Susc. Check)	34.7 a	46.4 b

[a] Data are averages of four replications. Averages followed by a different letter within each column are significantly different at $\alpha = 0.05$ according to Tukey's HSD.

[b] Susceptibility based on percent of root system galled: 0-1.0 = very resistant, 1.1-4.0 = resistant, 4.1-9.0 = moderately resistant, 9.1-20.0 = moderately susceptible, 20.1-40.0 = susceptible, 40.1-100.0 = very susceptible.

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If you have questions, please contact tfaske@uada.edu.