

## Susceptibility and Yield of Fifty-six Soybean Varieties to the Southern Root-knot Nematode, 2024

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The southern root-knot nematode (*Meloidogyne incognita*) is a major threat to soybean production and is the most yield-limiting plant-pathogenic nematode that affects soybean production in the Mid-South. It is found in nearly all soybean counties in Arkansas and can cause significant (>70%) grain yield losses when a susceptible variety is planted in a field with a high population density of southern root-knot nematode (RKN).

In this study, 56 commercially available soybean varieties marketed as suitable for production in southern RKN fields were screened. Varieties were divided into 4 experiments (Table 1 to 4) based on maturity group. Varieties were planted in a randomized complete block design with four replications per entry. Plots consisted of 4 rows, 30 ft long, spaced 30 in. apart, and separated by a 5-ft fallow alley. Plots were planted on 7 June at a seeding rate of 150,000 seeds/A. Six root systems were arbitrarily sampled at the R5 growth stage from non-harvest rows of each plot used for assessing southern RKN host susceptibility. The final nematode population (Pf) density averaged 648 second-stage juveniles (J2)/100 cm<sup>3</sup> soil at harvest for susceptible checks across all experiments. This density is considered severe for soybean production in Arkansas. The post-harvest threshold for southern root-knot nematode on soybean in Arkansas is J2 60/100 cm<sup>3</sup> soil. The two center rows of each plot were harvested on 15 Oct (maturity group IV) and 21 Oct (maturity group V). These results and those on the [UA variety testing website](#) can be helpful for variety selection for the 2025 cropping season.

Reports from previous trials (2016 to 2023) are available on the UADA website at <https://www.uaex.uada.edu/farm-ranch/pest-management/plant-disease/publications.aspx>

**What else is important:** Overall, the severity (percent of root system galled) was lower than last year, so the screen was not as good as in 2023. For example, Delta Grow ‘DB46XF54’ had a gall rating of 51.1% (VS) in 2023 and 16.4% (MS) in 2024. However, and overall, selecting a variety that is less susceptible will ensure a greater yield than a more susceptible one in a nematode infested field. For example, Pioneer ‘P46Z53E’ would have a lower gall rating and greater yield than Delta Grow ‘DG46E30’, but not Revere ‘48-F72’, if planted in the same field. Consult the cross-reference guide for soybean varieties to ensure different varieties selected are not the same genetics.

**Why is final nematode population density or “Pf” important?** The timing for these samples would be comparable to fall nematodes samples collected in commercial fields. Therefore, soybean varieties would expect to perform similarly when the nematode population density AND soil texture class (e.g., sandy loam) was similar. Overall, individual varieties will show a greater percentage of root system galled or susceptibility when grown in soils with a greater percentage of sand and nematode densities that are similar to the final nematode densities reported here. Furthermore, and more importantly, grain yield for individual varieties will decrease with increased drought stress AND when nematode densities are similar to that reported.

Table 1. Field performance of several MG IV soybean varieties in a southern root-knot nematode infested field. The soil texture was sandy loam soil (51% sand, 47% silt, and 3% clay). (Pf = 576 second-stage juveniles/100 cm<sup>3</sup> soil.)

Variety <sup>a</sup>	Percent root system galled <sup>c</sup>	Yield (bu/A)
Revere CT4413E3S	8.1 b-e <sup>b</sup>	78.4 a
AgriGold 4884E3	6.7 c-f	77.3 a
Pioneer P46Z53E	1.6 gh	76.5 ab
Armor 49-E15S	7.5 cde	74.1 abc
Pioneer P43A42X (check)	0.5 h	73.6 abc
GoSoy 493E22N	3.9 e-h	71.2 a-d
Delta Grow DG46E30 (check)	11.5 a-d	71.0 a-d
Progeny P4444 RXS	5.6 d-g	70.2 a-d
Delta Grow DG46E10	2.0 fgh	70.1 a-d
Armor 46-F35S	7.8 c-f	68.4 a-e
Revere 48-F72	5.8 c-g	65.4 a-e
Seitec Genetics B457XF/STS	13.7 a-d	64.8 a-e
Delta Grow DG46X54	16.4 a-d	60.6 b-e
Delta Grow DG46X54	17.0 a-d	58.2 cde
Seitic Genetics 479XF	11.1 a-d	54.8 de
Delta Grow DG47XF90	22.2 ab	54.3 de
Revere 49-F36	18.5 abc	52.3 e
Integra XF4875S	25.5 a	52.3 e

<sup>a</sup> Roundup Ready, Enlist, Xtend, & Xtend Flex variety.

<sup>b</sup> Means with different letters within a column indicate a significant difference at  $\alpha = 0.05$  according to Tukey's HSD test.

<sup>c</sup> Susceptibility was based on the percentage of root system galled where 0-1.0 = VR, 1.1-4.0 = R, 4.1-9.0 = MR, 9.1-20.0 = MS, 20.1-40.0 = S, 40.1-100.0 = VS.

Table 2. Field performance of several MG IV soybean varieties in a southern root-knot nematode infested field, experiment 2. The soil texture was silt loam soil (37% sand, 59% silt, and 5% clay). (Pf = 1,227 second-stage juveniles/100 cm<sup>3</sup> soil.)

Variety <sup>a</sup>	Percent root system galled <sup>c</sup>	Yield (bu/A)
Pioneer P43Z44SE	1.4 e <sup>b</sup>	62.0 a
Delta Grow DG43XF65	13.7 a-e	59.1 a
Delta Grow DG49E90	8.9 b-e	58.6 a
Delta Grow DG47E70	4.8 cde	58.3 ab
Pioneer P43A42X (check)	2.8 de	58.0 ab
Delta Grow DG 4940GLY	1.8 e	57.4 ab
Innictis A4448X	8.5 b-e	57.3 ab
Revere 45-F92	3.8 de	56.6 ab
Stine 49EE21	7.5 cde	55.8 abc
NK49-U9E3S	10.8 a-e	54.6 a-d
Progeny P4724XFS	9.0 b-e	54.2 a-d
Delta Grow DG48XF33STS	9.4 b-e	52.3 a-d
Armor 49-F05	11.1 a-e	51.8 a-d
Revere 44-F44	13.9 a-e	46.9 b-e
Delta Grow DG46E30 (check)	16.0 a-d	44.2 cde
Delta Grow 48XF70	32.4 a	43.8 de
Delta Grow DG4880GLY (check)	25.3 ab	40.0 e
Asgrow 45XF3	20.8 abc	38.2 e

<sup>a</sup> Roundup Ready, Enlist, Xtend, & Xtend Flex variety.

<sup>b</sup> Means with different letters within a column indicate a significant difference at  $\alpha = 0.05$  according to Tukey's HSD test.

<sup>c</sup> Susceptibility was based on the percentage of root system galled where 0-1.0 = VR, 1.1-4.0 = R, 4.1-9.0 = MR, 9.1-20.0 = MS, 20.1-40.0 = S, 40.1-100.0 = VS.

Table 3. Field performance of several MG V soybean varieties in a southern root-knot nematode infested field, experiment 3. The soil texture was sandy loam soil (49% sand, 49% silt, and 3% clay). (Pf = 469 second-stage juveniles/100 cm<sup>3</sup> soil.)

Variety <sup>a</sup>	Percent root system galled <sup>c</sup>	Yield (bu/A)
NK58-Y9XF	3.6 cd <sup>b</sup>	76.9 a
NK52-D6E3	6.1 bc	73.8 ab
Pioneer P53Z60LX	2.8 cd	71.3 abc
Asgrow AG56XF2	3.5 cd	70.8 a-d
Delta Grow DG55X25	5.8 bcd	69.3 a-e
Stine 52EG09	2.5 cd	67.4 a-e
Revere 5429E3	2.8 cd	66.6 b-e
Stine 52EG99	3.7 cd	66.1 b-e
Armor 54-F34	2.1 cd	64.5 b-e
Pioneer P52A14SE (check)	0.9 d	64.2 b-e
Revere 53-F84	16.9 ab	64.0 b-e
Asgrow AG52XF5	5.1 cd	63.4 cde
Innvictis A5451XF	2.3 cd	60.8 de
Delta Grow DG53XF95/STS (check)	27.5 a	60.0 e

<sup>a</sup> Roundup Ready, Enlist, Xtend, & Xtend Flex variety.

<sup>b</sup> Means with different letters within a column indicate a significant difference at  $\alpha = 0.05$  according to Tukey's HSD test.

<sup>c</sup> Susceptibility was based on the percentage of root system galled where 0-1.0 = VR, 1.1-4.0 = R, 4.1-9.0 = MR, 9.1-20.0 = MS, 20.1-40.0 = S, 40.1-100.0 = VS.

Table 4. Field performance of several MG V soybean varieties in a southern root-knot nematode infested field, experiment 3. The soil texture was silt loam soil (41% sand, 57% silt, and 3% clay). (Pf = 320 second-stage juveniles/100 cm<sup>3</sup> soil.)

Variety <sup>a</sup>	Percent root system galled <sup>c</sup>	Yield (bu/A)
Revere CT5293E3	9.1 bcd <sup>b</sup>	81.4 a
Innvictis A5558X	6.8 cd	76.1 ab
Progeny P5554RX	7.1 cd	75.6 ab
NK56-Z6XFS	3.8 d	75.2 ab
Seitic Genetics H506 XF/STS	39.2 a	72.7 abc
NK52-V1XF	23.3 abc	68.6 bcd
Pioneer P52A14SE (check)	8.2 d	64.0 cd
Innvictis A5813XF	7.2 bcd	63.0 d
Delta Grow DG53XF95/STS (check)	28.7 ab	62.1 d
Delta Grow DG52E30	3.9 d	62.0 d
Progeny P5751XFS	6.8 cd	62.0 d
Revere 5735XFS	3.0 d	62.0 d
Delta Grow DG55XF23	6.0 d	61.9 d
Delta Grow DG52XF90	29.5 ab	61.7 d

<sup>a</sup> Roundup Ready, Enlist, Xtend, & Xtend Flex variety.

<sup>b</sup> Means with different letters within a column indicate a significant difference at  $\alpha = 0.05$  according to Tukey's HSD test.

<sup>c</sup> Susceptibility was based on the percentage of root system galled where 0-1.0 = VR, 1.1-4.0 = R, 4.1-9.0 = MR, 9.1-20.0 = MS, 20.1-40.0 = S, 40.1-100.0 = VS.

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