Field Performance of Thirty-Six Soybean Varieties Marketed as Resistant to Southern Root-knot Nematode, 2022

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The southern root-knot nematode (*Meloidogyne incognita*) 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 used in a field with a high population density of southern root-knot nematode (RKN). Thirty-six commercially available soybean varieties marketed as resistance to the southern RKN were screened. Varieties were divided into 3 experiments (Table 1 to 3) based on maturity group. Varieties were planted in a randomized complete block design with four replications per entry. Plots were planted on 14 June in a field with moderate nematode pressure sampled in the fall and six root systems were arbitrarily sampled at R5 growth stage from non-harvest rows of each plot to assess southern RKN susceptibility. These results and those on the UA variety testing website can be helpful for variety selection for the 2023 cropping season.

Field performance of soybean varieties from previous trials (2016, 2017, 2018, 2019, 2020, and 2021) can be found on the UA Research Series website.

What else is important: Overall, the percent of root system galled was lower than previous years. Therefore, varieties that are categorized as moderately resistant (MR) can easily be moderately susceptible (MS) when nematode stress and moisture stress is greater. However, selecting a less susceptible variety will have a greater yield than a susceptible one. For example, Progeny 4444 RXS would be expected to have a lower percent root system galled and grater yield than DM48E62S, but not compare to Stine 46EB22 if planted in the same field. Finally, consult the cross-reference guide for soybean varieties to ensure different varieties selected are not the same genetics.

Table 1. Field performance of several MG IV soybean varieties in a southern root-knot nematode infested field. The soil texture was a loam soil (48% sand, 42% silt, and 10% clay).

Variety[a]	Percent root system galled[c]	Yield (bu/A)
Pioneer P43A42X (MR check)	2.9 d[b]	63.5 a
Petrus Seed 49G16	4.9 cd	61.0 a
Dyna-Gro S48EN02	5.7 cd	60.9 a
Delta Grow DG4940 GLY	3.8 cd	60.3 a
Progeny P4431E3	6.0 cd	60.1 a
Local LS4918E3S	7.9 cd	60.0 a
Progeny P4444RXS	9.4 cd	57.9 ab
Stine 49EE21	11.3 bc	57.7 ab
NK45-V9E3	11.3 bc	55.6 abc
Delta Grow 47E20	12.7 bc	49.1 a-d
Stine 46EB22	10.8 bcd	48.5 a-e
Delta Grow DG49E20 (S check)	22.6 ab	43.5 b-e
NK46-B4XFS	27.7 a	39.5 cde
Delta Grow DG4880 GLY (S check)	21.7 ab	37.3 de
Donmario DM48E62S	28.4 a	32.4 e

[a] Roundup Ready, Enlist, Xtend, & Xtend Flex var. MR = moderately resistant and S = susceptible.
[b] Means with different letters indicate a significant difference at $\alpha = 0.05$ according to Tukey's HSD test.
[c] Susceptibility categories based on % root system galled: 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 a sandy loam soil (52% sand, 42% silt, and 6% clay).

Variety[a]	Percent root system galled[c]	Yield (bu/A)
Pioneer P43A42X (MR check)	3.5 d[b]	55.9 a
Go Soy Ireane	4.5 d	54.2 ab
NK44-Q5E3S	13.2 a-d	53.5 ab
Go Soy 493E22N	6.9 cd	52.4 ab
AgriGold G4881E3	8.7 bcd	52.3 ab
Delta Grow 46E10	6.1 cd	51.8 ab
Pioneer 46A35X	7.8 cd	50.7 ab
Delta Grow DG49E20/STS (S check)	26.0 ab	42.8 abc
NK42-T5XF	25.9 ab	42.2 abc
NK49-T6E3	19.0 abc	41.1 abc
Delta Grow DG4880 GLY (S check)	31.0 a	41.1 abc
NK44-J4XFS	29.5 ab	40.9 abc
NK43-Y9XFS	19.6 abc	37.8 bc
NK45-P9XF	30.0 a	32.8 c

[a] Roundup Ready, Enlist, Xtend, & Xtend Flex var. MR = moderately resistant and S = susceptible.
[b] Means with different letters indicate a significant difference at $\alpha = 0.05$ according to Tukey's HSD test.
[c] Susceptibility categories based on % root system galled: 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 a sandy loam soil (58% sand, 30% silt, and 12% clay).

Variety[a]	Percent root system galled[c]	Yield (bu/A)
Pioneer 52A14E (MR check)	1.3 c[b]	51.2 a
NK52-D6E3	7.7 abc	50.5 a
Pioneer P54A54X	8.8 abc	47.7 a
Local Seed LS5588X	4.8 bc	44.8 a
Delta Grow 55X25 RR2X	4.1 bc	43.8 ab
Delta Grow 54XF20	3.5 bc	43.1 ab
Progeny P5554RX	6.7 abc	41.6 ab
Pioneer P56A71E	2.1 bc	39.1 ab
Delta Grow 52E80 (S check)	26.3 a	32.0 b
NK55-T5XF	11.1 ab	31.5 b

[a] Roundup Ready, Enlist, Xtend, & Xtend Flex var. MR = moderately resistant and S = susceptible.
[b] Means with different letters indicate a significant difference at $\alpha = 0.05$ according to Tukey's HSD test.
[c] Susceptibility categories based on % root system galled: 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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