

**2015 Maturity Group III
Soybean Variety Trial Report**
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Abstract

Recent research indicated Maturity Group III (MG 3) varieties planted early to mid-May have yield potential equivalent to MG 4 planted in April; equivalent or higher than MG 5 varieties; mature 2 or 3 weeks earlier than MG 4 or MG 5, respectively; and with earlier harvest improves combine harvest efficiencies, (harvest more acres with the same combine); and early soybean market season opportunities for higher prices. In 2015 a MG 3 variety trial evaluated 19 MG 3 varieties. The study was planted May 6, 2015 on a Leeper silty clay loam soil, Verona, MS. MG 4 (AG 4632) and MG 5 (NK S55-Q3) varieties were included in the study as standards for comparison. The MG 3 varieties initiated flowering (R1) about June 10 and reached physiological maturity (R6) late July or early August (5th). AG4632 initiated flowering June 11th and was at the R6 reproductive stage on August 11th. NK S55-Q3 (MG 5) initiated flowering July 3rd and was at R6 on August 26th. NK S55-Q3 had the highest yield of 76.9 bu/acre, and was higher than all MG 3 varieties. But it was not different from AG4632 yield of 69.0 bu/acre. NK S55-Q3 was in the pod-fill (R5) stage in early to mid-August and was able to take advantage of the August weekly rainfall events that totaled 7.36 inches. All MG 3 varieties were at R6 on August 5th and did not benefit from the August rainfall. However, three of the MG 3 varieties (Pioneer P39T67R, P93Y92 and NK S39-T3) yields were equivalent to the MG 4 variety (AG4632); and nine additional varieties had yields that ranged from 56.5 to 61.3 bu/acre. Two varieties (Pioneer P31T11R and P39T67R) evaluated for response to seeding rates indicated no yield differences for 140,000 to 180,000 seed/acre.

Materials and Methods

The study was conducted as a randomized complete block on a Leeper silty clay loam soil with four replications. Plot size was two (8-inch wide) twin rows on 38-inch beds x 20 ft. Plots were planted May 6, 2015. As indicated in Table 2, Pioneer P31T11R and P39T67R were planted at 140,000, 160,000 and 180,000 seed/acre. The standards AG4632 and NK S55-Q3 were planted at 140,000 seed/acre. The other varieties were planted at 160,000 seed/acre. Weeds and insect pests were controlled with appropriate pesticides. No foliar fungicides were applied. Reproductive stages R1 (first flower), R3 (full bloom) R6 (physiological maturity, seeds fully developed) and R8 (95% pods brown) were recorded for each variety. The varieties were rated for foliar diseases including late-season *Cercospora* (*Cercospora kikuchii*) (CLB), Frogeye leafspot (*Cercospora sojina*) (FLS) and Septoria brown spot (*Septoria glycines*). The ratings were

recorded prior to the R6.5 reproductive stage. The rating scale used for *Cercospora* leaf blight (CLB) and frogeye leaf spot (FLS) were based on a scale whereby 0 = no disease and 9 = severe disease. CLB was rated based on the presence of disease on leaves (0 to 5), petioles (6), and pods and stems (7 to 9) based on disease intensity as assessed by coloration of plant material (leaves with distinct purple coloration and petioles, pods and main stems with purple to near black coloration). Ratings for *Septoria* brown spot (*Septoria*) were based on a scale whereby 0 = no disease, 5 = disease in the middle of the canopy and 9 = disease in the upper canopy with severe defoliation. Plots were harvested 7 to 10 days after maturity, with a plot combine equipped with on-board, plot weight, seed test weight and seed moisture content measurement systems. Yields were adjusted to 13% seed moisture.

Results and Discussion

Rainfall during the growing season (Table 1) was highly variable with excess soil moisture followed by intermittent dry periods: a wet April followed by a 2 week dry period first of May; 3 weeks (May 15-June 10) excessive rainfall (7.81 inches); below normal rainfall (1.37 inches) for June 11 through July 2; 5.90 inches July 3-4th; only 0.56 inches rainfall from July 6 through July 30, and a wet August (7.36 inches). Early season saturated soil conditions during late May and early June may have resulted in reduced root growth and yield potential. In spite of the poor early season root growth and the dry period during the pod fill period (mid to late July), most MG 3 yields were in the 50 to 60 bu/acre yield range. There were only three MG 3 varieties which had yields below 50 bu/acre (Table 2). However, three MG 3 varieties (Pioneer P39T67R, P93Y92 and NK S39-T3) had yield equal to the MG 4 (AG4632); and nine additional varieties (Pioneer P93Y84, Mycogen 5N393R2, Asgrow AG3934, AG3832, AG3735, Dyna-Gro 32Y39, NK S39-U2, REV 38R10, REV 39A35) had yields that ranged from 56.5 to 61.3 bu/acre.

The MG 5 NK S55-Q3 reached physiological maturity August 26, 20 to 25 days later than MG 3 varieties. Since NK-S55-Q3 physiological maturity (R6) was August 26 (20 to 25 days later than MG 3), it was able to utilize the good rainfall amounts and distribution during pod fill while the MG 3 varieties were past R6 stage. NK S55-Q3 yield of 76.9 bu/acre was higher than all MG 3 varieties but was not different from the MG 4 (AG4632) variety yield of 69.0 bu/acre. The MG 3 varieties matured 10-14 days earlier than MG 4 and 18 days earlier than the MG 5 variety.

Pioneer P31T11R and P39T67R were evaluated with seeding rates of 140,000, 160,000 and 180,000 seed/acre (Table 2). Both of these varieties indicated no differences in seed rates. Further research with additional varieties need to be evaluated in comparison to a standard MG 4 and 5 varieties at seeding rates of 120,000 to 180,000 seed/acre.

Disease observations suggested that several of the planted varieties were tolerant to frogeye leaf spot, an important yield-limiting disease as well as tolerant to Cercospora blight and Septoria brown spot. Entries significantly differed in their observed response to the diseases that were rated. A wide range of response to Cercospora leaf blight was observed between the entries and ranged from a high of 8, where symptoms were present on leaves, pods, petioles and the main stem, to a low of 4.5, where Cercospora leaf blight symptoms were only observed on leaves. Frogeye leaf spot ranged from a high of 5.0 (NK S39-U2) to a low of 0.8 (Asgrow AG4632; a frogeye-resistant variety). On average, across all varieties regardless of planted population, frogeye leaf spot averaged 2.3. Of the 27 treatments, 41% were observed to have more frogeye leaf spot than the average. Septoria brown spot was observed in the plant canopy regardless of variety; however, for the most part, symptoms of the disease were only present from the bottom (t score of 0-3) to the middle of the plant canopy (a score of 4-5).

Table 1. 2015 Rainfall for Verona, MS.

Month	-----Days of Month-----			Total	% Normal ¹
	1-10	11-20	21-30		
	-----Rainfall (inches)-----				
April	2.99	3.40	1.24	7.63	153
May	0.00	1.86	4.80	6.66	114
June	1.15	0.47	0.90	2.52	58
July	5.90	0.25	0.31	6.46	151
August	2.33	3.22	1.81	7.36	205
<u>September</u>	<u>0.00</u>	<u>0.05</u>	<u>0.30</u>	<u>0.35</u>	8
Total	12.37	9.25	9.36	30.98	
% Total	40	30	30		

¹Based on the historical (1974-2014) monthly average rainfall.

Preliminary Data

Table 2. E-24-15 Maturity group soybean variety response to seeding rates in comparison to maturity group 4 and 5 variety, 2015, Verona, MS.

Brand	Variety	MG	-----X 1000-----		-----Dates ¹ -----			Bu/A
			Seed/A	Plants/A	R1	R6	R8	
NK	S55-Q3	5.5	140	123.45	7/03	8/26	9/28	76.9 ²
Asgrow	AG4632	4.6	140	132.74	6/11	8/11	9/24	69.0
Pioneer	P31T11R	3.1	140	122.08	6/10	7/31	8/24	36.3
Pioneer	P31T11R	3.1	160	138.24	6/10	7/31	8/24	42.0
Pioneer	P31T11R	3.1	180	153.37	6/10	7/31	8/24	39.9
Pioneer	P39T67R	3.9	140	113.13	6/11	8/04	9/10	60.6
Pioneer	P39T67R	3.9	160	120.36	6/11	8/04	9/10	<u>62.0</u> ³
Pioneer	P39T67R	3.9	180	142.36	6/11	8/05	9/10	60.9
Pioneer	P93Y92	3.9	140	124.48	6/10	8/05	9/10	<u>61.8</u>
Pioneer	P93Y92	3.9	160	137.89	6/10	8/05	9/10	59.8
REV	38R10	3.9	160	116.92	6/10	8/04	9/10	59.1
REV	39A35	3.9	160	125.17	6/10	8/09	9/10	57.2
NK Brand	S39-T3	3.9	160	144.08	6/10	8/07	9/14	<u>67.0</u>
NK Brand	S39-U2	3.9	160	136.86	6/10	8/01	9/11	57.5
Dyna-Grow	32Y39	3.9	140	120.01	6/10	8/04	9/10	55.7
Dyna-Grow	32Y39	3.9	160	133.77	6/10	8/04	9/10	57.5
Asgrow	AG3735	3.7	160	133.88	6/10	8/04	9/05	58.1
Asgrow	AG3832	3.8	160	131.36	6/10	8/01	9/10	58.4
Asgrow	AG3934	3.9	160	137.31	6/10	7/31	9/10	56.5
Mycogen	5N393R2	3.9	160	149.59	6/09	7/31	9/05	61.3
Mycogen	5N342R2	3.4	160	134.46	6/10	7/31	8/29	52.9
Pioneer	P93Y84	3.8	160	102.48	6/11	8/09	9/14	56.6
Pioneer	P36T86R	3.6	160	115.89	6/11	8/05	9/10	53.3
Pioneer	P35T58R	3.5	160	138.21	6/09	8/04	9/03	51.5
Pioneer	P32T16R	3.2	160	127.92	6/10	7/31	8/24	47.1
Pioneer	P93Y05	3.9	160	127.92	6/10	7/31	8/26	44.5
Pioneer	P31T77R	3.1	160	124.14	6/10	8/02	8/25	39.7
							LSD(P=0.05) = 7.5	
							CV = 9.6 %	

¹Phenology dates: R1 was first flower date; R6 physiological maturity (seeds fully develop and are separated from each other in the pod; and R8 is maturity [95% of the pods are brown (dry)]).

²Shaded values are not different from each other at the 5% probability levels.

³Values underlined are not different from the MG 4 (AG4632) standard.

Table 3. E-24-15 Maturity group III soybean variety leaf disease ratings in 2015, Verona, MS

Brand	Variety	MG	Seed/A X1000	CLB ^{1,2}	FLS ^{1,2}	Septoria ³
NK Brand	S55-Q3	5.5	140	6.0 cd	1.0 ij	2.5 fg
Asgrow	AG4632	4.6	140	4.8 f	0.8 j	2.3 g
Pioneer	P31T11R	3.1	140	7.3 ab	2.8 ef	4.3 a-e
Pioneer	P31T11R	3.1	160	8.0 a	1.5 hij	3.8 b-f
Pioneer	P31T11R	3.1	180	8.0 a	2.8 ef	3.8 b-f
Pioneer	P39T67R	3.9	140	4.8 f	4.3 ab	3.5 c-g
Pioneer	P39T67R	3.9	160	4.8 f	3.8 bc	3.0 efg
Pioneer	P39T67R	3.9	180	6.0 cd	3.3 cde	4.3 a-e
Pioneer	P93Y92	3.9	140	5.8 de	1.0 ij	4.8 abc
Pioneer	P93Y92	3.9	160	5.3 def	1.3 ij	3.8 b-f
REV	38R10	3.8	160	5.0 ef	1.5 hij	4.3 a-e
REV	39A35	3.9	160	4.5 f	2.5 efg	3.3 c-g
NK Brand	S39-T3	3.9	160	4.8 f	4.0 bc	4.7 a-d
NK Brand	S39-U2	3.9	160	5.8 de	5.0 a	3.0 efg
Dyna-Grow	32Y39	3.9	140	5.8 de	1.8 ghi	3.8 b-f
Dyna-Grow	32Y39	3.9	160	6.0 cd	1.3 ij	3.0 efg
Asgrow	AG3735	3.7	160	5.3 def	1.8 ghi	3.5 c-g
Asgrow	AG3832	3.8	160	5.7 de	1.8 ghi	3.8 b-f
Asgrow	AG3934	3.9	160	6.0 cd	1.0 ij	3.0 efg
Mycogen	5N393R2	3.9	160	6.0 cd	1.8 ghi	3.8 b-f
Mycogen	5N342R2	3.4	160	6.0 cd	3.0 def	4.5 a-d
Pioneer	P93Y84	3.8	160	4.8 f	3.3 cde	3.8 b-f
Pioneer	P36T86R	3.6	160	5.3 def	2.3 fgh	4.0 a-e
Pioneer	P35T58R	3.5	160	5.8 de	1.8 ghi	4.0 a-e
Pioneer	P32T16R	3.2	160	7.3 ab	3.3 cde	5.3 a
Pioneer	P93Y05	3.0	160	6.8 bc	1.8 ghi	4.5 a-d
Pioneer	P31T77R	3.1	160	7.3 ab	1.8 ghi	5.0 ab
			CV	11.0	29.5	26.7
			<i>P</i> -value	<0.0001	<0.0001	<0.0064
			LSD	0.9	0.9	1.5
			ST. DEV.	1.3	1.23	1.13

¹Ratings for CLB (cercospora blight) and FLS (frog-eye leafspot) were based on a scale whereby 0 = no disease and 9 = severe disease. CLB was rated progressively based on the presence of disease on leaves (0 to 5), petioles (6), and on pods and stems (7 to 9) based on disease intensity as assessed by coloration of plant material (leaves with distinct purple coloration and petioles, pods and main stems with purple to near black coloration).

²Means followed by the same letter(s) within a column are not significantly different according to Fisher's protected LSD ($P=0.05$)

³Ratings for Septoria (Septoria brown spot) were based on a scale whereby 0 = no disease, 5 = disease in the middle of the canopy, and 9 = disease in the upper canopy with severe defoliation.