

ROUNDUP AND CONVENTIONAL SOYBEAN VARIETY TRIALS

N. W. Buehring¹, M.P. Harrison¹, R. R. Dobbs¹, and Bernie White²

¹Northeast Branch Experiment Station; North Mississippi Research and Extension Center; Mississippi State University; Verona, MS 38879

²MAFES Research Support Unit, Mississippi State University

ABSTRACT: One hundred thirty Roundup Ready and 15 conventional varieties were evaluated on a Leeper silty clay soil in 2002. The Roundup Ready and conventional varieties were evaluated in separate studies with early maturity group (MG) IV, late MG IV, and MG V. Drought stress from August 1 through August 24 reduced soybean yield potential. Timely rainfall in June and July was more favorable for MG IV varieties than MG V. The early and late MG IV varieties had no seed rot or seed quality problems. However, excessive rainfall, warm temperatures, wet soggy soil conditions, and poor drying conditions from mid-October through November resulted in the total loss of all MG V varieties. The overall mean yields for early MG IV, late MG IV, and conventional MG IV were 43.9, 37.3, and 36.8, respectively. Individual, conventional, and Roundup Ready MG IV varieties produced more than 45 bu/ac. The lowest yielding variety in each study ranged from 24 to 29 bu/ac. When compared to the lowest yielding varieties in each study, selecting the most productive variety has the potential to almost double the soybean yield.

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KEYWORDS: Roundup, conventional, soybean, variety trials

MATERIALS AND METHODS: Seven field studies were conducted in 2002 on a Leeper silty clay loam soil, Verona, MS. Roundup tolerant and conventional varieties of early MG IV and V and late MG IV and V were evaluated. However, there was only one MG IV conventional variety study. All experiments were conducted as randomized complete block design with four replications. Plot size was 2 (30-inch) rows x 20 ft.

Fertilizer P and K were applied based on soil test recommendations. Potash (K₂O) at 250 lb/ac was applied surface broadcast on 10/24/01. The study area was paratilled 11/02/01; bed-rolled 11/03/01; and rebedded 3/05/02. A burndown application of Gramoxone Max (paraquat) + surfactant at 1.0 lb ai/ac + 0.5 pt/ac was applied 4/18/02 and repeated on 5/14/02. All conventional varieties and the Roundup Ready (RR) late MG IV and V varieties were planted 4/30/02. Due to excessive rainfall following planting, these studies had to be replanted 5/23/02. The RR early MG IV varieties and RR early MG V were planted 5/14/02. Roundup was used for weed control in all Roundup tolerant variety studies. Roundup Ultra Max (glyphosate) at 1.0 lb ai/ac was applied as a post-emergence application on 6/04/02, 6/16/02, and 7/08/02 to all Roundup Ready variety studies. All conventional varieties received a preemergence application of Scepter (imazaquin) + Prowl (pendimethalin) + Gramoxone Max + surfactant at 0.10 + 0.75 +

0.38 lb ai/ac + 0.5 pt/ac on 5/16/02. First Rate (cloransulam) + surfactant at 0.25 oz ai/ac + 0.2 pt/ac was applied postemergence to all conventional varieties on 6/04/02 and repeated 6/17/02. Orthene (acephate) at 0.27 lb ai/ac was applied to all studies for blister beetle control on 6/24/02.

Maturity dates, plant height at maturity, and lodging were recorded for all varieties. Except for the MG V varieties, the 2 rows of each variety were harvested within 5 days after maturity with a plot combine. The MG V varieties were not harvested due to the extended wet soil conditions. Following harvest, the grain was cleaned with a 3-sieve seed cleaner, weighed, and grain moisture was determined with a GAC II seed moisture analyzer. Yields were adjusted to 13% seed moisture. Variety mean yields in each study were separated using Fisher Protected LSD at the 10% significance level.

RESULTS AND DISCUSSION: Rainfall during the growing season was 12.1, 2.4, 7.7, and 2.1 inches for May, June, July, and August, respectively. A 3-week dry period from August 1 through August 25 reduced yield. In the early MG IV Roundup Ready variety trial, 30 varieties were evaluated. Plant height at maturity ranged from 28 to 45 inches. Maturity ranged from 9/02/02 to 9/12/02. Yields ranged from 29.2 to 52.3 bu/ac with an overall mean of 43.9 bu/ac. The varieties which were not different in yield from the highest yield variety (Asgrow AG4201) were USG 7440NRR, Armor 44-R4, Croplan RC 4222, LFS S4402-4, Genesis RC 444RR, LFS S4442-4, Asgrow AG 4603, Morsoy RT 4480, Hartz H 4554RR, Garst 4512RR/N, Dyna-Gro 3443NRR, Hartz H 4454RR, and Hornbeck HBK R4622.

Thirty varieties in the Roundup Ready late MG IV were evaluated (Table 2). The yields ranged from 23.7 to 47.3 bu/ac with an overall mean yield of 37.3 bu/ac. Maturity dates ranged from 9/13/02 to 10/10/02. Plant height at maturity ranged from 27 to 48 inches. The highest yield variety was HBK R4820 with 47.3 bu/ac. Varieties which were not different in yield from HBK 4820 were Morsoy RT 4731, Southern States RT 5001N, Agripro 4888RR, Armor 47-G7, Pioneer 94B73, Delta King DK 4763RR, and Progeny PGY 4932RR.

Four conventional varieties were evaluated in the MG IV study (Table 3). Maturity dates ranged from 9/30/02 to 10/01/01. Plant height at maturity ranged from 40 to 46 inches. The study mean yield was 36.8 bu/ac. DP 47485 was the highest yield variety with 46.0 bu/ac and was higher than all other varieties.

COOPERATORS: None

PUBLICATIONS: None

Table 1. Roundup Ready Group IV (Early Maturity) soybean variety trial planted 5/14/02, Verona, MS, Lee County¹

Variety	Brand	Year			Maturity date	Plant ht
		2000	2001	2002		
AG 4201	Asgrow	----	----	52.3	9/02	38
USG 7440NRR	Unisouth	----	----	51.2	9/09	39
Armor 44-R4	Armor	----	51.3	50.8	9/09	39
RC 4222	Croplan	----	----	49.4	9/05	34
LFS S4402-4	Delta King	----	----	48.8	9/05	37
RC 444RR	Genesis	----	----	48.4	9/09	37
LFS S4442-4	Delta King	----	----	48.2	9/12	37
AG 4603	Asgrow	----	----	47.6	9/12	36
RT 4480	Morsoy	----	----	47.5	9/12	38
H 4554RR	Hartz	----	----	47.0	9/05	40
4512RR/N	Garst	----	42.9	46.9	9/05	41
3443NRR	Dyna-Gro	----	48.0	46.9	9/12	36
H 4454RR	Hartz	----	39.7	46.4	9/05	37
HBK R4622	Hornbeck	----	----	46.1	9/12	30
DP 4344RR	Deltapine	37.8	42.3	44.1	9/02	44
DK 4461RR	Delta King	----	----	44.0	9/05	37
94B13	Pioneer	----	----	43.2	9/02	33
USG 7449RR	UniSouth	----	----	42.2	9/12	43
DK 4868RR	Delta King	----	----	41.9	9/12	34
RC 4444	Croplan	----	47.4	41.7	9/09	40
3463NRR	Dyna-Gro	43.1	50.9	41.5	9/12	36
DP 4690	Deltapine	32.3	44.5	41.1	9/12	45
AG 4403	Asgrow	45.7	52.8	41.0	9/09	37
RT 4502N	S. States	----	----	39.9	9/12	37
RC 4432	Croplan	----	----	39.8	9/12	39
TV 4589RR	Terral	43.2	33.8	39.8	9/09	28
S40-R9	Syngenta	----	----	39.6	9/05	35
RT 446N	S. States	----	30.8	38.0	9/12	34
AG 4702	Asgrow	43.5	48.1	33.8	9/05	35
DK 4762RR	Delta King	----	----	29.2	9/12	45
Overall Mean				43.9		
LSD (0.10)				6.2		
Error degrees of Freedom....				119		
CV (%).....				11.9		

¹Leeper silty clay loam.

Table 2. Roundup Ready Group IV (Late Maturity) soybean variety trial planted 5/23/02, Verona, MS, Lee County¹

Variety	Brand	Year			Maturity Date	Plant ht
		2000	2001	2002		
HBK R4820	Hornbeck	-----	-----	47.3	9/30	34
RT 4731	Morsoy	-----	-----	44.9	9/13	36
RT 5001N	S. States	-----	-----	44.3	9/30	37
4888RR	Agripro	-----	-----	44.0	9/30	44
A47-G7	Armor	-----	-----	42.9	9/13	39
94B73	Pioneer	-----	-----	42.8	9/13	39
DK 4763RR	Delta King	-----	-----	42.5	9/13	39
PGY 4932RR	Progeny	-----	-----	40.2	9/30	44
RT 4980	S. States	-----	48.2	39.4	9/30	43
RT 4902	S. States	-----	-----	39.4	9/23	40
94B74	Pioneer	-----	-----	38.8	9/16	44
TV 4886RR	Terral	44.8	40.5	38.5	9/30	48
TV 4890RR	Terral	45.5	47.9	38.2	9/13	40
AG 4902	Asgrow	47.7	42.7	37.3	9/16	34
FS S4882-4	Lawhorn	-----	-----	36.6	9/16	27
HBK R4920	Hornbeck	-----	45.2	36.4	9/30	38
RT 4809	Morsoy	44.0	43.7	36.4	9/30	36
4803	Dixie	-----	42.8	36.1	9/30	46
4922	FFR	-----	-----	36.0	9/30	43
PGY 4858RR	Progeny	-----	-----	35.9	9/30	42
3484 NRR	Dyna-Gro	-----	-----	35.5	9/23	44
RC 4995	Croplan	-----	41.5	35.2	9/30	44
RT 517N	S. States	-----	-----	34.9	9/30	31
4891	FFR	-----	-----	34.6	9/30	40
A 484RR	Genesis	-----	43.1	34.2	9/19	42
9492	Pioneer	51.7	40.0	33.7	9/16	35
4712	FFR	-----	-----	31.2	9/30	38
4950RR	Delta Grow	-----	51.4	29.3	9/30	35
ES Prairie RR	Eagle Seed	-----	27.5	27.2	9/30	41
SG 498RR	Deltapine	25.6	39.5	23.7	10/10	37
	Overall mean	-----	-----	37.3	-----	39
				LSD (0.10)		7.0
				Error degrees of Freedom		119
				CV (%)		16.0

¹Leeper silty clay loam.

Table 3. Group IV soybean variety trial planted 5/23/02, Verona, MS, Lee County¹

Variety	Brand	-----Year-----			Maturity date	Plant Ht
		2000	2001	2002		
		bu/ac	bu/ac	bu/ac		(in)
DP 4748S	Deltapine	39.7	58.3	46.0	10/01	44
HBK 4891	Hornbeck	41.5	49.7	36.2	10/01	42
HBK 4944CX	Hornbeck	-----	-----	35.4	9/30	46
PGY 4910	Progency	36.8	43.4	29.6	10/01	40
		Overall Mean		36.8		43
		LSD (0.10)		4.7		
		Error degrees of Freedom		15		
		CV (%)		9.8		

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