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SOYBEAN VARIETY YIELD TEST IN 2000

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Introduction

The annual testing of Roundup Ready, non-Roundup Ready, and food grade soybean varieties and experimental lines was conducted at three locations in New York. Entries in Maturity Groups 00 and I were tested at all three locations, Aurora, Mt. Morris, and Chazy. Unfortunately, excessively wet May and June conditions prevented planting at a fourth test site, Canton. Entries in Group II were tested at only the Aurora and Mt. Morris sites, the sites that represent the warmer parts of Upstate New York. Also, food grade varieties, Group II varieties developed at Iowa State University, were only tested at Aurora and Mt. Morris. All seed companies that are known to be distributing soybeans in New York were invited to enter their selections in these tests at a fee. Some unsponsored varieties, Group 0 public varieties from Canada, were also included in the tests.

At each location we planted all entries of the same maturity group in a separate test. Also, Roundup Ready, non-Roundup ready, and food grade varieties were evaluated in separate tests. Each individual plot at Chazy consisted of four 20-ft. rows spaced 14 inches apart. At Aurora and Mt. Morris, each individual plot consisted of 10 20-ft. rows spaced 7 inches apart. Each entry was planted at a seeding rate of about 225,000 seeds/acre in four replications at each location. We used preemergence herbicide applications and hand-weeding for weed control in the non-Roundup Ready and food grade tests and 3 pints/acre of Roundup Ultra in the Roundup Ready tests.

Yields were determined by harvesting a 18-foot section of the two center rows at Chazy and the seven center rows at Aurora and Mt. Morris in October. The soybeans were then cleaned with a small clipper seed cleaner and tested for moisture. All yields were adjusted to 13% moisture. Standard statistical analyses (ANOVA test) were then conducted on the data. If

there were no site x variety interactions, the LSD value is only presented for the average yield across sites. If there was a site x variety interaction, the LSD value is presented for each site.

Aurora and Mt. Morris

Both sites were exceptionally wet in April and May (Table 1). Nevertheless, we were able to plant the Aurora site on 17 May and the Mt. Morris site on 26 May. Final stands at the Aurora site, however, were less than 200,000 plants/acre, the recommended population, especially for the food grade varieties, because of very cool conditions from the 18 May until 1 June. Final stands averaged close to 200,000 plants/acre for most varieties at the Mt. Morris site.

July was the second coldest on record in New York so both sites averaged close to 100 GDD less than normal in July. Also, most of upstate New York received a killing frost on the morning of 29 September. Consequently, most of the Group II varieties did not attain physiological maturity at Mt. Morris (Tables 2 and 3). Despite the 17 May planting date at the Aurora site, some Group II varieties did not fully mature there because of the cool July and early frost.

In the non-Roundup Ready trials, the Group 0 and Group I varieties had similar average yields at both sites (Table 2). Typically, Group I varieties yield about 3 to 4 bu/acre more than Group 0 varieties at both sites. All Group 0 and Group I varieties attained physiological maturity and drought did not occur at either site so neither factor contributed to the similar average yield between maturity groups. We speculate that the Group 0 varieties may have been better adapted to the cool conditions, especially the cool nights, that occurred throughout July and then again from about 18 until 26 August.

The Group 0 varieties, OAC Stratford, OAC Bayfield, OAC Oxford, Telstar, OAC Auburn, OAC Embro, and Sentry yielded the same (Table 1). Telstar and Sentry have yielded

the most in the Group 0 trials over the last couple of years. A site x variety interaction existed for yield in the Group I tests. As in the previous 2 years, APK184 and S19-90 yielded the most in the Group I test along with the newly-released variety, S19-79, at the Aurora site (Table 2). At the Mt. Morris site, however, only APK184 and S19-90 yielded the most (Table 2). The variety, S19-90, had the least lodging at both sites (Table 2).

In the Roundup Ready trials, the Group II vs. Group I varieties yielded 3 bu/acre more at Aurora and 7 bu/acre more at Mt. Morris (excluding PR659RR, which is a Group 0 variety). The top-yielding Group I varieties included APK190RR, APK143RR, and DKB19-51 (Table 2). A site x variety interaction existed for yield in the Group II Roundup Ready study. DKB28-51, AG2703, DKB26-51, and DKB23-51 yielded the most at Aurora but yielded the least at the Mt. Morris site (Table 2). These four varieties developed the least at Mt. Morris before the killing frost, which undoubtedly contributed to their low yields at Mt. Morris.

Eleven of the food grade varieties yielded more than the standard variety, Vinton 81 (Table 3). Unfortunately, all of the food grade varieties yielded less than the non-food grade check variety, 9244, at the Aurora site. Most food grade varieties had poorer final stands than 9244, which probably contributed to their lower yields. Also, the food grade varieties generally showed more lodging when compared with the non-food grade varieties (Tables 2 and 3). The variety, IA2044, which had the least lodging, also had the highest numerical yield, despite not attaining physiological maturity at either site. The variety, IA 2041, yielded more than Vinton 81 in 1999, but yielded the same as Vinton 81 in 2000.

The variety, IA2041, however, had greater protein concentration than Vinton 81 did (Table 4), which is consistent with the results from last year. High protein content is a favorable characteristic for food grade soybeans so IA2041 may be a potential food grade variety for New York. Other varieties that yielded more and had similar protein concentration as Vinton 81

include HP204, IA2048, IA2049, IA2044, IA2046 and IA2012. The variety HP204 had the same protein concentration and yield as Vinton 81 did in 1999. Also, IA2012 had the same yield but lower protein concentration in 1999. Unfortunately, we have tested food grade varieties in New York only in 1999, the driest year on record at Aurora, and in 2000, the year with the 4th wettest April through June and the 2nd coldest July on record. Hopefully, 2001 will bring more normal weather conditions.

Chazy

As with all locations in New York, Chazy was also wet in April and May so planting was delayed until 29 May. The somewhat late planting date and cool growing season contributed to the lack of physiological maturity for most Roundup Ready varieties and a couple of non-Roundup Ready varieties (Table 5). Nevertheless, yields averaged very high at this site for both the non-Roundup Ready (72 bu/acre) and Roundup Ready (65 and 68 bu/acre for Group 0 and Group I varieties, respectively) varieties (Table 5).

The varieties OAC Auburn, T97-17, Sentry, OAC Bayfield, Enterprise, OAC Stratford, Olympia, DKB0973, and DKB13-81 yielded the most in the non-Roundup Ready test. Most varieties showed no lodging at this site (Table 5). Surprisingly, OAC Auburn had the highest numerical yield, despite not quite attaining physiological maturity before the killing frost.

Although the Group I Roundup Ready varieties barely attained the 7.0 growth stage by the time of killing frost (Table 5), the Group I Roundup Ready varieties averaged 68 bu/acre compared with 65 bu/acre for the Group 0 Roundup Ready varieties. None of the Roundup Ready varieties showed any lodging. The variety AG081 yielded the most in the Group 0 Roundup Ready test and AG1602 and DKB16-51 yielded the most in the Group I Roundup Ready Test.

Table 1. Monthly precipitation and growing degree days (GDD) at Aurora, Mt. Morris, and Chazy during the 2000 growing season.

Month	PRECIPITATION			GDD (86-50°F)		
	Aurora	Mt. Morris	Chazy	Aurora	Mt. Morris	Chazy
	-----in-----			-----°F-----		
April	4.85	4.78	4.39	-	-	-
May	4.45	4.91	4.47	352	359	241
June	3.76	4.58	2.88	501	510	395
July	2.57	2.51	2.76	559	550	532
August	3.23	3.88	2.48	557	542	525
September	4.22	4.01	2.16	388	421	301
	23.08	24.67	19.14	2357	2412	1994

Table 2. Yield, height, lodging, and physiological maturity of early, medium, and late maturing non-Roundup Ready and Roundup Ready soybean varieties at Aurora and Mt. Morris, New York in 2000.

Variety	YIELD			HEIGHT			LODGING [†]			MATURITY [‡]	
	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris
	-----bu/acre-----			-----in-----			-----score-----			-----date-----	
<u>EARLY (Group 0)</u>											
OAC Stratford	57	70	63	33	37	35	2.5	3.6	3.0	9/16	9/23
OAC Bayfield	55	71	63	31	32	31	1.8	2.9	2.3	9/12	9/18
OAC Oxford	53	73	63	33	40	36	1.0	1.4	1.2	9/14	9/19
Telstar	57	65	61	35	36	35	2.5	3.5	3.0	9/18	9/25
OAC Auburn	56	64	60	33	30	31	1.0	1.5	1.3	9/12	9/18
OAC Embro	52	67	60	29	32	30	1.5	3.1	2.3	9/13	9/18
Sentry	55	64	60	31	31	31	2.0	2.3	2.2	9/17	9/25
Olympia	49	60	55	32	36	34	1.0	2.3	1.6	9/16	9/22
Mean	54	67		32	34		1.6	2.6			
LSD 0.05				3	4				0.6		
<u>MEDIUM (Group I)</u>											
APK184	54	72	63	32	40	36	2.0	2.9	2.4	9/21	9/27
S19-90	52	74	63	34	40	37	1.5	1.3	1.4	9/21	9/27
S19-79	54	65	60	32	37	35	1.3	2.1	1.7	9/20	9/25
APKX185	48	64	56	30	39	34	2.0	2.0	2.0	9/22	9/28
DKB13-81	50	61	55	30	36	33	1.3	1.5	1.4	9/18	9/25
Mean	51	67		31	38		1.6	2.0			
LSD 0.05			4			2	0.5	0.7			
<u>LATE (Group II)</u>											
S25-35	54	64	59	33	39	36	1.5	1.5	1.5	7.5	7.0

Table 2 Cont.

YIELDHEIGHTLODGING[†]MATURITY[‡]

Variety	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris
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-----bu/acre-----

-----in.-----

-----score-----

-----date-----

ROUNDUP READY (Group I)

APK190RR	55	62	58	34	37	35	1.0	2.8	1.9	9/25	7.5
APK143RR	54	58	56	35	32	33	1.7	3.0	2.3	9/19	9/25
DKB19-51	47	62	55	32	35	33	1.0	2.0	1.5	9/22	9/28
APKX186RR	48	61	54	32	33	32	1.0	2.7	1.8	9/22	9/28
AG1602	48	59	54	32	31	32	1.0	2.0	1.5	9/17	9/23
DKB10-51	48	57	52	28	26	27	1.0	1.0	1.0	9/15	9/20
DKB16-51	46	57	52	30	33	32	1.0	1.7	1.4	9/21	9/26
AG1801	48	54	51	31	33	32	1.0	2.3	1.7	9/23	9/28
APK112RR	43	54	49	30	32	31	1.3	3.3	2.3	9/21	9/27
APK198RR	52	-		34	-		2.7	-	-	9/24	-
PR659RR	<u>36</u>	<u>35</u>	36	<u>28</u>	<u>24</u>	26	<u>1.0</u>	<u>1.0</u>	1.0	9/9	9/15
	48	56		31	35		1.2	2.4			
LSD 0.05			6			6			0.7		

ROUNDUP READY (Group II)

S24-K4	50	72	61	37	39	38	2.3	2.9	2.6	9/23	9/27
AG2302	49	70	59	35	41	38	1.3	2.0	1.7	9/28	7.4
AG2103	47	71	59	34	38	36	1.0	1.6	1.3	9/24	9/28
DKB26-51	53	64	59	39	41	40	2.0	2.1	2.0	9/28	7.2
S20-Z5	49	66	57	37	39	38	1.0	1.8	1.4	9/22	9/27
DKB23-51	53	62	57	32	39	35	1.3	2.1	1.7	9/28	7.2
AG2703	54	60	57	35	39	37	2.0	2.0	2.0	7.4	6.7
DKB28-51	<u>57</u>	<u>52</u>	55	<u>35</u>	<u>40</u>	38	<u>2.5</u>	<u>2.3</u>	2.4	7.7	6.7
	51	65		35	39		1.7	2.1			
LSD 0.05	6	8				2			0.7		

[†] Lodging is evaluated on a 1 (no lodging) to 5 (all plants lodged completely) score.

[‡] For varieties that did not mature, their growth stage at the time of frost is listed.

Table 3. Yield, height, lodging, and physiological maturity of food grade soybean varieties (Group II) at Aurora and Mt. Morris, New York in 2000.

Variety	YIELD			HEIGHT			LODGING [†]			MATURITY [‡]	
	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris
	-----bu/acre-----			-----in.-----			-----score-----			-----date-----	
IA2044	49	68	58	37	37	37	1.3	1.4	1.3	7.6	7.2
IA2040	49	68	58	35	37	36	2.5	2.6	2.6	7.3	7.0
IA2037	52	63	57	34	35	35	2.5	2.5	2.5	7.8	7.3
IA2043	49	66	57	34	38	36	2.0	2.9	2.4	9/28	7.6
IA2046	50	63	57	33	36	35	1.8	2.4	2.1	7.4	7.0
HP204	49	64	56	41	41	41	2.5	3.6	3.1	9/28	7.6
IA2012	51	61	56	34	39	36	2.5	3.1	2.8	9/27	7.5
IA2048	46	64	55	35	38	37	1.5	1.6	1.6	7.3	6.9
IA2049	47	63	55	35	40	37	1.5	2.0	1.8	7.2	6.9
IA2011	50	61	55	34	37	35	2.5	3.9	3.2	9/26	7.4
IA2045	49	60	55	33	36	34	2.0	2.8	2.4	7.5	7.0
IA2034	48	60	54	37	39	38	2.3	2.6	2.4	9/28	7.4
IA2047	48	61	54	36	40	38	2.0	2.1	2.1	7.3	6.9
IA2041	47	61	54	37	40	38	1.8	2.4	2.1	9/28	7.4
IA2042	48	60	54	34	39	37	2.8	4.0	3.4	9/28	7.4
Vinton 81	44	56	50	40	42	41	3.0	2.9	2.9	9/26	7.6
9244	<u>59</u>	-	-	<u>36</u>	-	-	<u>1.5</u>	-	-	9/24	-
	48	62		35	38		2.1	2.7			
LSD .05			5			2			0.5		

[†] Lodging is evaluated on a 1 (no lodging) to 5 (all plants lodged completely) score.

[‡] For varieties that did not mature, their growth stage at the time of frost is listed.

Table 4. Protein concentration, oil content, and 100 seed weight of food grade soybean varieties (Group II) at Aurora and Mt. Morris, New York in 2000.

Variety	<u>PROTEIN</u>			<u>OIL</u>			<u>100 SEED WEIGHT</u>		
	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.	Aurora	Mt. Morris	Avg.
	-----%-----			-----%-----			-----g-----		
IA2041	42.2	40.5	41.4	16.2	16.6	16.4	21.3	20.0	20.6
IA2034	41.2	39.1	40.2	15.8	16.8	16.3	22.5	22.5	22.5
HP204	40.7	39.0	39.9	16.8	17.3	17.1	22.3	22.5	22.7
IA2047	40.0	39.6	39.8	17.5	17.2	17.4	29.8	27.5	28.4
Vinton 81	40.4	38.8	39.6	16.8	17.3	17.1	22.8	21.8	22.3
IA2048	39.8	38.9	39.4	17.5	17.6	17.6	29.8	27.8	28.8
IA2049	39.7	38.8	39.3	17.4	17.6	17.5	29.5	28.0	28.8
IA2044	39.7	38.4	39.1	17.5	17.7	17.6	28.8	26.5	27.6
IA2046	39.1	38.7	38.9	17.2	17.2	17.2	29.0	28.3	28.6
IA2012	39.0	38.6	38.8	17.0	17.0	17.0	29.0	27.8	28.4
IA2042	39.5	38.7	38.6	17.1	17.3	17.2	21.3	21.3	21.3
IA2011	39.2	37.4	38.3	17.6	18.3	18.0	19.3	20.3	19.8
IA2037	38.9	37.5	38.2	17.2	17.8	17.5	31.5	29.5	30.5
IA2040	38.5	37.7	38.1	17.3	17.8	17.6	31.0	27.8	29.4
IA2045	38.1	37.6	37.9	17.9	17.9	17.9	29.0	27.3	28.1
IA2043	37.9	37.6	37.8	17.3	17.6	17.5	29.5	29.3	29.4
9244	<u>37.0</u>	-	-	<u>18.2</u>	-	-	<u>15.3</u>	-	-
Mean	39.6	38.6		17.1	17.4		26.7	25.5	
LSD .05			1.2			0.5			2.4

Table 5. Yield, height, lodging, and physiological maturity of non-Roundup Ready and Roundup Ready soybean varieties at Chazy, New York in 2000.

VARIETY	YIELD	HEIGHT	LODGING†	MATURITY‡
	-----bu/acre-----	-----in-----	-----score-----	-----date-----
OAC Auburn	77	32	1.0	7.7
T97-17	77	31	1.0	9/25
Sentry	76	32	1.2	9/25
OAC Bayfield	76	31	1.2	9/25
Enterprise	73	28	1.0	9/25
OAC Stratford	73	32	1.8	9/25
Olympia	73	32	1.0	9/25
DKB02-73	72	31	1.0	9/25
DKB13-81	71	29	1.0	9/25
Telstar	69	32	1.4	7.1
OAC Oxford	69	30	1.0	9/25
OAC Embro	<u>64</u>	<u>30</u>	<u>1.0</u>	9/25
	72	31	1.1	
LSD 0.05	7	3	0.2	
<u>ROUNDUP READY (GROUP 0)</u>				
AG0801	72	33	1.0	9/26
DKB03-51	67	30	1.0	9/26
DKB06-51	64	33	1.0	7.5
APK094RR	60	32	1.0	7.2
PR659RR	<u>60</u>	<u>30</u>	<u>1.0</u>	7.5
	65	32	1.0	
LSD 0.05	5	NS	NS	
<u>ROUNDUP READY (GROUP I)</u>				
AG1602	74	31	1.0	7.0
DKB16-51	70	34	1.0	7.1
DKB19-51	67	30	1.0	6.8
DKB10-51	67	29	1.0	7.3
AG1801	<u>61</u>	<u>30</u>	<u>1.0</u>	6.7
	68	31	1.0	
LSD 0.05	6	5	NS	

† Lodging is evaluated on a 1 (no lodging) to 5 (all plants completely lodged) score.

‡ For varieties that did not mature, their growth stage at the time of frost is listed.