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This circular reports the agronomic performance of entries in the 2012 South Dakota performance trials for glyphosate-resistant and non-glyphosate-resistant soybean varieties. Major factors in variety selection include yield, maturity, lodging resistance, and *Phytophthora* root rot resistance.

Major factors in variety selection include:

- Yield
- Maturity
- Lodging resistance
- *Phytophthora* root rot resistance

Soybean Variety Performance Trials Results - Volga

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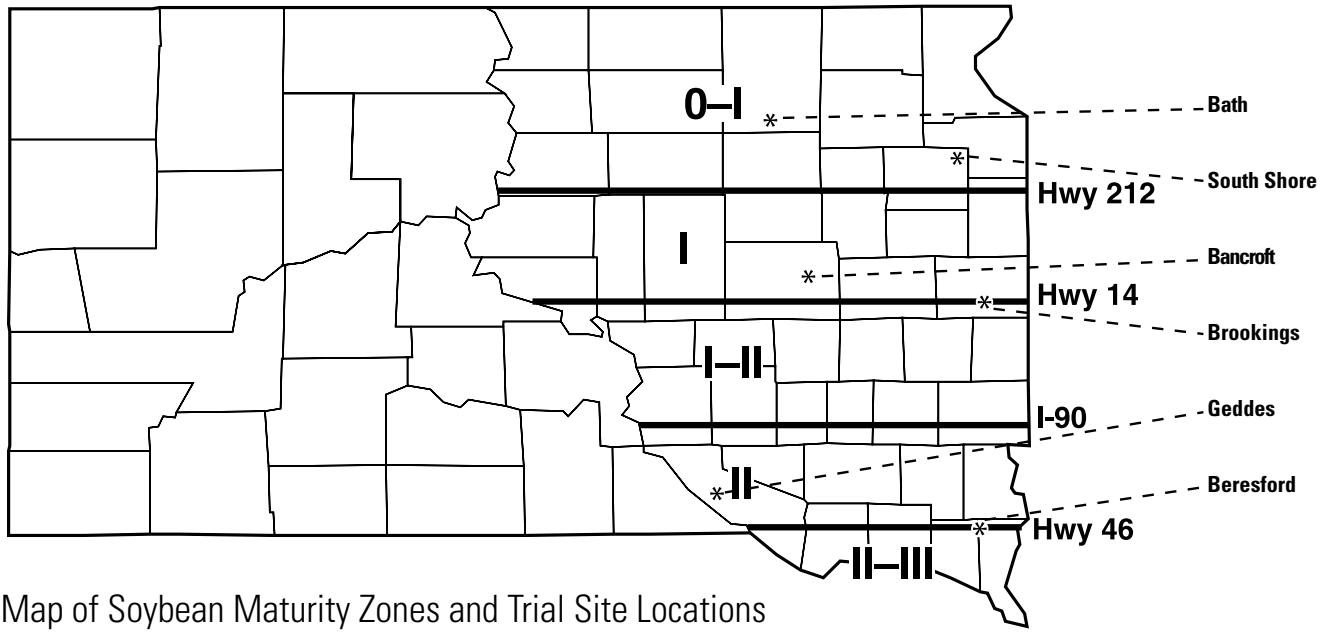
Soybean production is greatly affected by variety selection. This circular reports the agronomic performance of entries in the 2012 South Dakota performance trials for glyphosate-resistant and non-glyphosate-resistant soybean varieties. Major factors in variety selection include yield, maturity, lodging resistance, and *Phytophthora* root rot resistance.

Soybean varieties are classified according to maturity groups that in turn are adapted to maturity zones. Maturity zones are based on day length and therefore are affected by latitude. The very early maturity group-00 varieties are best suited to Canada and bordering regions of the U.S., while maturity group-0, group-I, and group-II varieties are suited to South Dakota. The later groups III-VIII are suited to Iowa, Nebraska, and south to Texas.

Inoculation of seed with the appropriate nitrogen-fixing bacterium is a good practice. Always inoculate if seeding soybeans in soils not previously cropped to soybeans. On older soybean ground, there is no guarantee that N-fixing bacteria will be present to inoculate the seed, thus, consider inoculation cheap insurance that N-fixing bacteria will be present.

Use care when evaluating the yield performance of entries in each table. Entries tested for two years may also have a top yield group value in the 2012 yield column. Each company selects the appropriate maturity group trial (maturity group-0, -I, or -II trial) and locations for their entries. There are, however, no standard regional or national check varieties for maturity. It is suggested you compare the reported maturity rating of every entry you are considering with the days to maturity (DTM) calculated for each entry at each location.

Phytophthora root rot (PRR) is an important soybean disease in South Dakota and is often controlled or managed with the use of resistant varieties. Resistance to *Phytophthora* root rot is fungus-race specific. Thus, resistance to one PRR race does not always impart resistance to other races. Knowledge of the prevalent PRR races in your area is important. If you suspect you have a PRR problem, using varieties with a wide range of rot resistance is strongly suggested. The gene resistance of each variety to PRR is supplied by each seed company (proprietary entries) or by the USDA (Uniform Soybean Tests, Northern States, public entries). The PRR gene for each entry, as given by the seed company is reported in each yield table. Specific race resistance to PRR can be determined by cross-referencing the PRR gene reported in each yield table with table A (glyphosate-resistant entries) to find the resistant races. Currently, races -1, -3, and -4 are the most common races in South Dakota.



Map of Soybean Maturity Zones and Trial Site Locations

Table A. *Phytopthora* Root Rot race resistance by gene code and name.

PRR Code	Gene Name	Race Resistance
0	rps1	None
1A	Rps1, Rps1a	1-2,10-11,13,15-18,24
1B	Rps1b	1,3-9,13-15,18,21-22
1C	Rps1c	1-3,6-11,13,15,17,21,23-24
1K	Rps1k	1-11,13-15,17-18,21-22,24
2	Rps2	1-5,9-20
3,3a	Rps3, 3a	1-5,8-9,11,13-14,16,18,23,25
4	Rps4	1-4,10,12-16,18-21,25
5	Rps5	1-5,8-9,11-14,18,20,25
6	Rps6	1-4,10,12,14-16,18-21,25
7	Rsp7	16,18,19
K6	Rps1k, Rps6	1-22,24-25
C3	Rps1c, Rps3	1-10,13-18,22-25
B3	Rps1b	1-9,13-16,18,21-23,25
NR	NR	Not Reported

Table B. General test information.	
Location	Glyphosate and Non-glyphosate resistant soybean trial results - MG-0, -I, and -II
Cooperator:	SDSU Plant Science Research Farm – Volga, Doug Doyle and staff
Soil Type:	Brandt silty clay loam, 0-2% slope
Tillage:	Conventional
Fertility Yield-Goal:	70 bushel
Previous Crop:	Spring wheat (stubble)
Row Space:	30 inches
Seeding Population	165,000/acre
Soil Inoculant:	Nitragin-brand Soybean Soil Implant down the seed tube by label instructions
Weed Control:	Glyphosate-resistant trials: 1 qt. Roundup
	Non-glyphosate-resistant trials: Premergence, 1qt Dual 2 + cultivation
Insect Control:	None
Disease Control:	None
Date Seeded:	May 21, 2012

Plot yields were adjusted to 13% moisture content and expressed in bushels per acre. Harvest was accomplished using a Massey Ferguson 8XP small plot combine. Explanations of the various references contained within the performance tables can be found in table C.

Table C. Explanation of performance table references [.].	
No.	**Explanation of references**
[1]	Seed treatment as reported by seed company.
[2]	Phytopthora root rot (PRR) gene reported by seed company, cross-reference with table A.
[3]	Maturity rating reported by seed company.
[4]	Days to maturity (DTM) – the number of days to maturity from seeding to 95% brown pod. If data is missing [.] the plots were exposed to a killing frost before they attained the 95% brown pod stage.
[5]	Lodging ratings: 0= all plants erect, 3= 50% of plants lodged at 45°-angle, 5= all plants flat. Shatter ratings: 1= none, 2= 1-10%, 3= 10-20%, 4= 25-50%, 5= > 50% pods shattered.
[6]	Least Significant Difference (LSD 0.05) – the difference two values within a column must equal or exceed to be significantly different from one another at the 0.05 level of probability. If the difference is less than the LSD value the difference between the values is nonsignificant (NS).
[7]	TPG-avg. – the minimum value within a column that entry yield values must equal or exceed to qualify for the top-performance group (TPG).
[8]	TPG-avg. – the maximum value within a column that lodging or shatter rating values must equal or be less than to qualify for the TPG.
[9]	Coefficient of variation (C.V.) - the percent of experimental error associated with a test trial. Ideally, the CV values for yield are less than 15%. If the yield CV values exceed 15% the trial contained too much experimental error to be a valid, thus no data analysis for the table yield column is reported.

Table 1. Glyphosate-resistant soybean variety performance results - MG-0, Volga

Brand/ Variety __Seed Trt.[1] __PRR gene [2] __Mat. rtg. [3]	DTM [4]	Yield Averages* bu/a		2012 Ldg.Rtg. (1-5) [5]
		2-Yr	2012	
SODAK GENET./ SD1093RR __NR __0 __ 0.9	111	55	40	1
SODAK GENET./ SD2061R2Y __Cruiser Maxx __1c __ 0.6	110	.	45	1
SODAK GENET./ SD2091R2Y __Cruiser Maxx __1c __ 0.9	112	.	42	1
Test avg. :	111	55	42	1
High avg. :	112	55	45	1
Low avg. :	110	55	40	1
[6] Test LSD (.05):	112	0	NS**	0
[7] Min.TPG-avg. :	112	55	40	.
[8] Max.TPG-avg. :	112	.	.	1
[9] Test Coef. Var.:	1	0	6	0
No. Entries:	3	1	3	3

NOTE: Table reference numbers [1-9] are explained in Table C.
* Shaded values within a yield or lodging rating column are included in the top-performance group (TPG). Therefore, look for varieties that have shaded values within each yield or lodging rating column.
** Indicates differences between values within a yield or lodging rating column are non-significant (NS).

Table 2. Glyphosate-resistant soybean variety performance results - MG-I, Volga

Brand/ Variety __Seed Trt.[1] __PRR gene [2] __Mat. rtg. [3]	DTM [4]	Yield Averages* bu/a		2012 Ldg.Rtg. (1-5) [5]
		2-Yr	2012	
CHANNEL/ 1405R2 __Acceleron __1c __ 1.4	112	58	45	1
G-2 GENETICS/ 6162 __Trilex+Allegiance+Gaucho __1c __ 1.6	111	56	45	1
ASGROW/ AG1431 __Acceleron+Poncho/Votivo __1c __ 1.4	111	56	44	1
WENSMAN/ W 3140R2 __Acceleron __0 __ 1.4	115	55	45	1
MUSTANG/ 11302 __Acceleron __3 __ 1.1	112	55	44	1
CHANNEL/ 1805R2 __Acceleron __1c __ 1.8	115	54	44	1
PRAIRIE BR./ PB-1591R2 __NR __NR __ 1.5	117	54	44	1
RENK/ RS140NR2 __NR __1c __ 1.4	115	54	44	1
ASGROW/ AG1631 __Acceleron+Poncho/Votivo __1c __ 1.6	114	54	43	1
REA/ 72G21 __NR __1c __ 1.3	117	54	43	1
REA/ 78G12 __NR __1c __ 1.8	114	54	43	1
REA/ 71G20 __NR __0 __ 1.1	111	54	42	1
PRAIRIE BR./ PB-1743R2 __NR __NR __ 1.7	119	54	42	1
DAIRYLAND/ DSR-1808/R2Y __Cruiser Maxx __1c __ 1.8	118	53	45	1
WENSMAN/ W 3120R2 __Acceleron __1c __ 1.2	114	53	40	1
PRAIRIE BR./ PB-1823R2 __NR __NR __ 1.8	114	52	43	1
RENK/ RS141R2 __NR __1c __ 1.4	115	52	43	1
HEFTY/ H16Y12 __NR __1k __ 1.6	115	52	42	1
REA/ 75G12 __NR __1c __ 1.5	114	52	40	1
HEFTY/ H18Y12 __NR __0 __ 1.8	117	51	42	1
STINE/ 16RA02 __Cruiser __1k __ 1.7	114	51	41	1
PRAIRIE BR./ PB-1722R2 __NR __NR __ 1.7	115	51	41	1
RENK/ RS172NR2 __NR __1c __ 1.7	117	50	41	1
PIONEER/ 91Y90 __PPST Pkg. __NR __ 1.9	116	49	38	1
HEFTY/ H17Y12 __NR __1k __ 1.7	118	49	38	1
SODAK GENET./ SD2172R2Y __Cruiser Maxx __1c __ 1.7	111	.	48	1
DAIRYLAND/ DSR-1710/R2Y __Cruiser Maxx __1c __ 1.7	118	.	46	1
MUSTANG/ 19723 __Acceleron __0 __ 1.9	117	.	44	1
HEFTY/ EXP-H14R3 __NR __1c __ 1.4	113	.	44	1
STINE/ 16RD02 __Cruiser __1k __ 1.6	115	.	44	1
PRAIRIE BR./ EXP 12161 __NR __NR __ 1.6	117	.	44	1
SODAK GENET./ SD2101R2Y __Cruiser Maxx __1k __ 1	110	.	44	1
SODAK GENET./ SD2149R2Y __Cruiser Maxx __NR __ 1.4	111	.	44	1
ASGROW/ AG1733 __Acceleron+Poncho/Votivo __1c __ 1.7	117	.	43	1
HEFTY/ H13Y11 __NR __1c __ 1.3	114	.	43	1
PRAIRIE BR./ PB-1566R2 __NR __NR __ 1.5	115	.	43	1
NORTHSTAR/ NS 1726NR2 __Acceleron __1c __ 1.7	117	.	43	1
NORTHSTAR/ NS 1916NR2 __Acceleron __1c __ 1.9	117	.	43	1
RENK/ RS153NR2 __NR __1c __ 1.5	114	.	43	1
RENK/ RS183NR2 __NR __1c __ 1.8	117	.	43	1

Table 2. Glyphosate-resistant soybean variety performance results - MG-I, Volga (continued)

Brand/ Variety __Seed Trt.[1] __PRR gene [2] __Mat. rtg. [3]	DTM [4]	Yield Averages* bu/a		2012 Ldg.Rtg. (1-5) [5]
		2-Yr	2012	
MUSTANG/ 14323 __Acceleron __1c __ 1.4	114	.	42	1
PIONEER/ 91Y74 __PPST Pkg. __1k __ 1.7	114	.	42	1
HEFTY/ H16Y11 __NR __1c __ 1.6	117	.	42	1
CHANNEL/ 1606R2 __Acceleron __3a __ 1.6	116	.	42	1
PRAIRIE BR./ PB-1637R2 __NR __NR __ 1.6	114	.	41	1
WENSMAN/ W 3142NR2 __Acceleron __1k __ 1.4	112	.	41	1
HEFTY/ H12Y11 __NR __3 __ 1.2	110	.	40	1
HEFTY/ H15Y12 __NR __3 __ 1.5	118	.	40	2
G-2 GENETICS/ 7186 __Trilex+Allegiance+Gaucho __1k __ 1.7	117	.	40	2
G-2 GENETICS/ 7183 __Trilex+Allegiance+Gaucho __1c __ 1.8	115	.	40	1
PRAIRIE BR./ EXP 12228P __NR __NR __ 1.9	118	.	40	1
PRAIRIE BR./ PB-2042R2 __NR __NR __ 1.9	117	.	40	1
SODAK GENET./ SD2181NR2Y __Cruiser Maxx __1c __ 1.8	117	.	40	1
PIONEER/ 91Y81 __PPST Pkg. __1c __ 1.8	114	.	38	1
HEFTY/ H18Y11 __NR __1c __ 1.8	118	.	38	1
WENSMAN/ W 3160NR2 __Acceleron __1c __ 1.6	111	.	38	1
WENSMAN/ W3190NR2 __Acceleron __1k __ 1.9	119	.	38	1
MUSTANG/ 15523 __Acceleron __1c __ 1.5	114	.	37	1
HEFTY/ H11Y12 __NR __3 __ 1.1	110	.	37	1
PRAIRIE BR./ EXP 12245P __NR __NR __ 1.9	121	.	36	1
G-2 GENETICS/ 1191 __Trilex+Allegiance+Gaucho __1k __ 1.9	114	.	35	1
Test avg. :	115	53	42	1
High avg. :	121	58	48	2
Low avg. :	110	49	35	1
[6] Test LSD (.05):		3	5	NS**
[7] Min.TPG-avg. :		54	43	.
[8] Max.TPG-avg. :		.	.	2
[9] Test Coef. Var.:		6	8	23
No. Entries:	61	25	61	61

NOTE: Table reference numbers [1-9] are explained in Table C.
* Shaded values within a yield or lodging score column are included in the top-performance group (TPG). Therefore, look for varieties that have shaded values within each yield or lodging score column.
** Indicates differences between values within a yield or lodging score column are non-significant (NS).

Table 3. Glyphosate-resistant soybean variety performance results - MG-II, Volga

Brand/ Variety __Seed Trt.[1] __PRR gene [2] __Mat. rtg. [3]	DTM [4]	Yield Averages* bu/a		2012 Ldg.Rtg. (1-5) [5]
		2-Yr	2012	
WENSMAN/ W 3200NR2 __Acceleron __1c+1k __ 2	116	55	46	1
ASGROW/ AG2031 __Acceleron+Poncho/Votivo __1c __ 2	116	54	46	1
REA/ 84G20 __NR __1c __ 2.4	119	52	52	1
PRAIRIE BR./ PB-2544R2 __NR __NR __ 2.5	121	51	50	1
RENK/ RS202NR2 __NR __1c __ 2	115	51	46	1
HEFTY/ H23Y12 __NR __1k __ 2.3	120	51	45	2
RENK/ RS210NR2 __NR __1c __ 2.1	120	51	43	1
REA/ 80G11 __NR __1k __ 2	115	51	41	1
PRAIRIE BR./ PB-2242R2 __NR __NR __ 2.2	118	49	47	1
WENSMAN/ W 3230R2 __Acceleron __1c __ 2.3	119	49	47	1
PIONEER/ 92Y51 __PPST Pkg. __1k __ 2.5	120	47	47	1
PRAIRIE BR./ PB-2419RR2 __NR __NR __ 2.4	119	47	42	1
HEFTY/ H23Y10 __NR __1c __ 2.3	119	47	40	1
HEFTY/ H22Y12 __NR __1c __ 2.2	119	47	38	1
DAIRYLAND/ DSR-2105/R2Y __Cruiser Maxx __1k __ 2.1	119	46	38	1
PRAIRIE BR./ PB-2391R2 __NR __NR __ 2.3	119	45	40	1
MUSTANG/ 23530 __Acceleron __1c __ 2.3	118	45	38	1
WENSMAN/ W 3222NR2 __Acceleron __1c __ 2.2	118	.	50	1
MUSTANG/ 20823 __Acceleron __1c __ 2	116	.	49	1
G-2 GENETICS/ 7213 __Trilex+Allegiance+Gaucho __1c __ 2.1	120	.	48	1
CHANNEL/ 2402R2 __Acceleron __1c __ 2.4	120	.	48	1
HEFTY/ EXP-H24R3 __NR __3 __ 2.4	119	.	47	1
PRAIRIE BR./ PB-2143R2 __NR __NR __ 2.1	123	.	47	1
PRAIRIE BR./ PB-2230R2 __NR __NR __ 2.2	120	.	47	1
PRAIRIE BR./ PB-2351R2 __NR __NR __ 2.3	118	.	46	1
PRAIRIE BR./ PB-2366R2 __NR __NR __ 2.3	117	.	46	1
RENK/ RS213NR2 __NR __1c __ 2.1	117	.	46	1
PIONEER/ 92Y32 __PPST Pkg. __1c __ 2.3	124	.	45	1
NORTHSTAR/ NS 2077NR2 __Acceleron __1c __ 2	117	.	45	1
MUSTANG/ 22823 __Acceleron __1k __ 2.2	119	.	44	1
G-2 GENETICS/ 7203 __Trilex+Allegiance+Gaucho __0 __ 2	117	.	43	1
G-2 GENETICS/ 7208 __Trilex+Allegiance+Gaucho __1c __ 2	116	.	43	1
SODAK GENET./ SD2201NR2Y __Cruiser Maxx __1c __ 2	116	.	43	1
HEFTY/ EXP-H21R3 __NR __1k __ 2.1	118	.	42	1
CHANNEL/ 2105R2 __Acceleron __1c __ 2.1	117	.	41	1
PRAIRIE BR./ EXP 12241 __NR __NR __ 2.4	124	.	38	1
MUSTANG/ 21993 __Acceleron __1k __ 2.1	119	.	37	1
HEFTY/ H20Y12 __NR __1c __ 2	115	.	37	1
HEFTY/ EXP-H20R3 __NR __1c __ 2	117	.	36	1
PRAIRIE BR./ PB-2650R2 __NR __NR __ 2.6	124	.	36	1
Test avg. :	118	49	44	1
High avg. :	124	55	52	2
Low avg. :	115	45	36	1
[6] Test LSD (.05):		NS**	NS	NS
[7] Min.TPG-avg. :		45	36	.
[8] Max.TPG-avg. :		.	.	2
[9] Test Coef. Var.:		11	17	0
No. Entries:	40	17	40	40

NOTE: Table reference numbers [1-9] are explained in Table C.

* Shaded values within a yield or lodging rating column are included in the top-performance group (TPG). Therefore, look for varieties that have shaded values within each yield or lodging rating column.

** Indicates differences between values within a yield or lodging rating column are non-significant (NS).

Table 4. Non-glyphosate resistant soybean variety performance results for maturity groups -0, -I and -II -Volga.

Brand/ Variety	DTM [4]	Yield average by maturity group								
		MG-0			MG-I			MG-II		
		Yield-bu/a		2012 Ldg. Rtg. (1-5) [5]	Yield-bu/a		2012 Ldg.Rtg. (1-5) [5]	Yield-bu/a		2012 Ldg. Rtg. (1-5) [5]
		2-yr	2012		2-yr	2012		2-yr	2012	
PUBLIC/ SURGE	112	49	39	1	.	.	.	.	.	.
SK/ FOOD INTL SK095	113	.	34	2	.	.	.	.	.	.
RICHLAND/ ORG. MK0508	105	49	33	2	.	.	.	.	.	.
SK/ FOOD INTL SK0796	110	.	33	2	.	.	.	.	.	.
RICHLAND/ ORG. MK831	106	43	32	2	.	.	.	.	.	.
SK/ FOOD INTL SK0786	110	.	31	2	.	.	.	.	.	.
NORTHSTAR/ NS1128NLL	113	.	.	.	.	41	1	.	.	.
NORTHSTAR/ EXPNS1428NLL	119	.	.	.	.	41	1	.	.	.
RICHLAND/ ORG. TITAN	110	.	.	.	.	40	1	.	.	.
PUBLIC/ DEUEL	113	.	.	.	49	40	2	.	.	.
PUBLIC/ BROOKINGS	118	.	.	.	46	40	1	.	.	.
RICHLAND/ ORG. MK1016	112	.	.	.	44	34	3	.	.	.
RICHLAND/ ORG. MK9101	112	.	.	.	38	33	1	.	.	.
RICHLAND/ ORG. CHALLENG	117	.	.	.	.	33	1	.	.	.
SK/ FOOD INTL SK9801	109	.	.	.	42	27	2	.	.	.
PUBLIC/ DAVISON	117	.	.	.	.	.	.	46	37	1
Test avg.:	112	47	34	2	44	37	1	46	37	1
High avg.:	119	49	39	2	49	41	3	.	.	.
Low avg. :	105	43	31	1	38	27	1	.	.	.
[6] LSD (.05):		NS**	5	<1	NS	4	<1	.	.	.
[7] Min. TPG avg.:		43	34	.	38	37	.	.	.	.
[8] Max. TPG avg.:		.	.	1	.	.	2	.	.	.
[9] Coef. Var.:	3	4	8	17	7	6	28	.	.	.

NOTE: Table reference numbers [1-9] are explained in Table C.

* Shaded values within a yield or lodging score column are included in the top-performance group (TPG). Therefore, look for varieties that have shaded values within each yield or lodging score column.

** Indicates differences between values within a yield or lodging score column are non-significant (NS).

GLYPHOSATE-RESISTANT SOYBEAN VARIETY TRIAL RESULTS

Maturity Group-0 (Table 1):
The two-year and 2012 test-yield averages were 55 and 42 bushels per acre, respectively, the lodging score average was 1. Varieties had to average 40 bushels or higher to be in the top yield group for 2012. Only a single variety was tested for two years. Variety yield averages did not differ among varieties tested for 2012. All the variety lodging rating values were in the top performance group for lodging rating because there was no difference among them.

Maturity Group-I (Table 2):
The two-year and 2012 test-yield averages were 53 and 42 bushels per acre, respectively; and the lodging rating average was 1. Varieties had to average 54 and 43 bushels or higher to be in the top yield group for two years and for 2012, respectively. The two-year variety yield differences had to differ by 3 bushels to be significantly different, while the 2012 variety yield differences had to differ by 5 bushels to be significantly different. Varieties did not differ in lodging rating values in 2012.

Maturity Group-II (Table 3):
The two-year and 2012 test-yield averages were 49 and 44 bushels per acre, respectively; and the lodging rating average was 1. Varieties had to average 45 and 36 bushels or higher to be in the top yield group for two years and for 2012, respectively. Variety yield differences among both the two-year averages and 2012 averages were not significant (NS). Variety lodging rating values had to equal 2 to be in the top performance group for lodging rating and because the lodging rating differences were not significant (NS).

NON-GLYPHOSATE-RESISTANT SOYBEAN VARIETY TRIAL RESULTS

Maturity Group-0 (Table 4):
The two-year and 2012 test-yield averages were 47 and 34 bushels per acre, respectively, and the lodging rating average was 2. Varieties had to average 43 and 34 bushels or higher to be in the top yield group for two years and for 2012, respectively. Variety yield differences among the two-year averages were not significant (NS), while the 2012 variety yield differences had to differ by 5 bushels to be significantly different. Variety lodging rating values had to equal 1 to be in the top performance group for resisting lodging, and the rating values had to differ by 1 to be significantly different.

Maturity Group-I (Table 4):
The two-year and 2012 yield averages were 44 and 37 bushels per acre, respectively, and the lodging rating average was 1. Varieties had to average 38 and 37 bushels or higher to be in the top yield group for two years and for 2012, respectively. Variety yield differences among the two-year averages were not significant (NS), while the 2012 variety yield differences had to differ by 4 bushels to be significantly different. Variety lodging rating values had to equal 1 to be in the top performance group for resisting lodging, and rating values had to differ by 1 to be significantly different.

Maturity Group-II (Table 4):
Only one released variety was tested in this trial in 2011 and 2012.

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