



2013 Pennsylvania Soybean Performance Report

Soybean tests are conducted annually to provide information regarding the performance of soybeans grown in Pennsylvania. This report summarizes performance results for 2013. The shorter season varieties (Groups II and III) were tested at the Russell E. Larson Agricultural Research Center at Rock Springs in Centre County and on a private farm near Martinsburg in Blair County. The longer maturing varieties (Groups III and IV) were tested at the Southeast Agricultural Research and Extension Center located in Lancaster County. Both Glyphosate-resistant (Roundup Ready) varieties as well as non-Roundup Ready varieties were tested at the Centre and Lancaster County locations. At the Blair County location, only Roundup Ready varieties were tested. The following soybean variety trials were implemented for the 2013 season: Early (MG 3.3 and earlier) full-season Roundup Ready in Lancaster County; Late (MG 3.4 and later) full-season Roundup Ready in Lancaster County; full-season non-Roundup Ready in Lancaster County; Early (MG 3.0 and earlier) full-season Roundup Ready in Centre and Blair Counties; late (MG 3.1 and later) full-season Roundup Ready in Centre and Blair Counties; full-season non-Roundup Ready in Centre County. Both non-Roundup Ready trials had two commonly grown Roundup Ready entries which were used as a check for comparison against the other varieties. Individual trial results were measured separately and therefore it is highly recommended that comparisons among varieties be limited to within-trial comparisons and not across the different trials.

Procedures

The private seed company entries in this test were those chosen by the companies for testing. The plots in all locations had 5 rows, each planted 20 feet long. Rows were spaced 15 inches apart. Each plot was trimmed to 18 feet and the 3 middle rows were harvested. The trials in Lancaster and Centre Counties were planted in tilled ground and the Blair County trial was no-tilled. The Blair County trials were planted on May 3rd, the Centre County trials were planted on May 7th, and the Lancaster County trials were planted on May 17th. Seeding rates of all trials were adjusted to obtain approximately 150,000 plants per acre. Varieties in each trial were replicated four times.

The following observations were made for some or all of the trials:

Yield was based on 60 lbs. per bushel and adjusted to 13 percent moisture.

Maturity is the date when approximately 95 percent of pods had reached their mature color.

Height is the average length of plants from the ground to the tip of the main stem.

Lodging was rated in all tests as follows:

- 1 = almost all plants erect.
- 2 = all plants leaning slightly or a few plants down.
- 3 = all plants leaning moderately, or 25-50 percent of the plants down.
- 4 = all plants leaning considerably, or 50-80 percent of the plants down.
- 5 = almost all plants down.

Seed quality was rated according to the following scale:

- 1 = very good
- 2 = good
- 3 = fair
- 4 = poor
- 5 = very poor

Seed size represents the approximate number of seeds in one pound.

Crude Protein (CP) is expressed as a percent of the soybean at 13% moisture.

Oil is expressed as a percent of the soybean at 13% moisture.

Interpretation of results

Variety performance differences are caused partially by genetic differences and partially by soil variation and other environmental variations which cannot be adequately controlled. Thus, small differences in performance may have no significance. Multiple-year averages are a more valid indication of the performance of a specific variety than are data for a single year. Statistical procedures have been used for the most important characteristics to allow meaningful comparisons of variety averages at a particular location. A standard least significant difference (LSD) value is provided for comparing varieties. Any difference between two variety averages that exceeds the LSD value is considered significant and not simply a result of uncontrolled environmental variation.

Traditionally, LSD values have been calculated at the 0.05 level of confidence, which means that when differences between varieties exceed the LSD, we can be 95% confident that the differences are not due to chance. The downside of this approach is that it leads to the conclusion that many varieties in the test have similar yield performance, when there really may be differences in the yield potential. Many universities have switched to a less conservative 0.25 level for the LSD, thus reducing the chance of concluding that varieties are not different, when a true difference exists among the lines. In this report, we present the LSD values at both the 0.05 level and the 0.25 level for your consideration.

The value of coefficient of variation (CV) is a measure of relative variation useful in evaluating the precision achieved in an experiment. In grain and forage trials, for example, the CV value for yield is often between 5 and 15 percent. Confidence in the reliability of the experimental results declines as the CV value increases. Uncontrollable or immeasurable variations in soil fertility, soil drainage, and other environmental factors contribute to increased CV values.

Results

During the 2013 season, the average yield of the 29 entries in the Centre County Roundup Ready Late MG trial was 58.3 bushels per acre. The Early MG trial consisted of 19 entries and averaged 49.3 bushels per acre. These yields were down somewhat compared to the 2012 yields in the same trials, especially in the early MG trial, which averaged almost 12 bushels higher in 2012. The non-Roundup Ready trial in Centre County averaged 57.1 bushels per acre, which was slightly lower when compared to 2012 trial. Growing conditions in Centre County were unusually cold and windy for the first few weeks after planting, which caused some soil crusting and subsequent thin stands in places. June and July had near normal growing conditions, but by early August, the weather turned dryer than normal and continued to be unusually dry through much of September. This dry weather most likely affected pod-fill for many soybean varieties.

The Blair County Roundup Ready Late MG trial, which consisted of 30 entries, averaged 52.3 bushels per acre. The Roundup Ready Early MG trial in Blair County had 16 entries and averaged 54.2 bushels per acre. Yields in both trials were down when compared to the 2012 yields in the same trials, especially the Late MG trial, which averaged over 15 bushels higher in 2012. Growing conditions at the Blair County trials were similar to the Centre County trials, including the unusually cold weather soon after planting and the late season dry period.

Yields in the 2013 Lancaster County Roundup Ready Late MG trial, consisting of 59 entries, averaged 62.7 bushels per acre. The Early MG trial, which had 27 entries, averaged 63.8 bushels per acre. The non-Roundup Ready trial averaged 68.4 bushels per acre. The 2013 yields in all three trials were slightly higher compared to the same trials in 2012. Growing conditions in Lancaster County were excellent during the month of June, with warm temperatures and a total of 5.7 inches of rain. July was a little dryer than June, with a total of 2.6 inches of rain for the month. August had near normal temperatures, with a little over 4 inches of timely rainfall for the month, which undoubtedly had a positive effect on pod-fill for many of the entries.

Table 2. Early Roundup Ready Soybean Variety Performance in Centre County, 2013 (MG 3.0 and earlier).

Source	Entry	Seed Treatment	Yield, bu/A	Height (in.)	Maturity Date	Lodging (1-5, 1=best)	Seeds per lb.	Seed Quality (1-5, 1=best)	Crude Protein % @ 13% H2O	Oil % @ 13% H2O	2 Yr Avg. Yield, bu/A (2012-13)	3Yr Avg. Yield, bu/A (2011-13)
Seedway	SG2813	CruiserMaxx	53.0	36	21-Sep	2.3	2735	1.5			56.3	
NK Brand	S28-U7	CruiserMaxx	52.9	36	22-Sep	2.0	2565	2.0			52.1	
NK Brand	S30-E9	CruiserMaxx	52.8	34	20-Sep	1.0	2768	1.5				
Doebler's	RPM® DB2812RR™	Gaucho/Evergol /Allegiance	52.1	34	19-Sep	1.0	2768	2.0			55.9	
Doebler's	RPM® DB2612RR™	Gaucho/Evergol /Allegiance	51.8	32	20-Sep	1.5	2855	1.5			54.1	
Hisoy	HS 28A12	CruiserMaxx	51.1	33	19-Sep	1.5	2929	2.0			56.8	
Pioneer	92Y91		50.7	37	22-Sep	2.0	2624	1.5				
Dyna-Gro Seed	SX13827R	Acceleron/Imidacloprid	50.4	31	19-Sep	1.5	2838	2.0				
Hubner	H30-13R2		50.3	36	23-Sep	2.5	3047	1.5				
Seedway	SG3011	CruiserMaxx	50.2	36	23-Sep	1.5	2838	1.5			61.7	
Hubner	H28-10R2		48.7	34	21-Sep	2.0	2987	2.0			55.1	59.3
Mycogen	5N304R2	CruiserMaxx	48.6	38	23-Sep	2.0	2820	1.0				
Dyna-Gro Seed	S38RY28	Acceleron/Imidacloprid	48.0	36	19-Sep	2.0	3290	1.5			55.8	57.5
Chemgro	C3044R2	Encase	47.0	35	23-Sep	1.5	2910	1.5			56.5	61.9
Chemgro	C2747R2	Untreated	46.7	32	19-Sep	1.5	2694	2.0				
Mycogen	5N292R2	CruiserMaxx	46.4	37	22-Sep	2.0	2838	1.5				
Dyna-Gro Seed	S29RY74	Acceleron/Imidacloprid	46.2	35	22-Sep	2.0	2929	1.5				
Doebler's	RPM® DB3012RR™	Gaucho/Evergol /Allegiance	44.9	36	21-Sep	1.5	3088	1.5			53.1	
Mycogen	5N284R2	CruiserMaxx	44.1	37	22-Sep	2.5	3110	1.5			55.4	
Mean			49.3	35	21-Sep	1.8	2875	1.6			55.7	59.6
LSD (.05)			5.8									
LSD (.25)			3.4									
CV %			8.4									

Table 3. Late Roundup Ready Soybean Variety Performance in Blair County, 2013 (MG 3.1 and later)

Source	Entry	Seed Treatment	Yield, bu/A	Height (in.)	Lodging (1-5, 1=best)	Seeds per lb.	Seed Quality (1-5, 1=best)	Crude Protein % @ 13% H2O	Oil % @ 13% H2O	2 Yr Avg. Yield, bu/A (2012-13)
Mycogen	5N342R2	CruiserMaxx	59.2	38	2.0					64.4
Channel	3306R2	Aceleron	58.5	36	1.5					
Hisoy	HS 35A12	CruiserMaxx	58.0	38	2.5					63.7
Hisoy	HS 31A03	CruiserMaxx	57.0	37	2.0					62.2
NK Brand	S34-N3	CruiserMaxx	55.7	39	1.5					59.4
NK Brand	S35-C3	CruiserMaxx	55.3	37	2.0					
Chemgro	C3546R2	Encase	55.3	36	1.5					61.9
Pioneer	93M11		54.5	31	1.5					
Mycogen	5N312R2	CruiserMaxx	54.4	35	1.0					
Hisoy	HS 37A12	CruiserMaxx	53.3	38	2.0					61.5
Hisoy	HS 34A16	CruiserMaxx	53.1	34	2.0					
Hisoy	HS 32A14	CruiserMaxx	53.0	39	2.0					61.7
Chemgro	C3247R2	Encase	52.7	34	2.5					
Dyna-Gro Seed	S34RY36	Acceleron/Imidacloprid	52.5	39	2.0					61.9
Chemgro	C3346R2	Encase	52.2	36	2.0					60.2
Hisoy	HS 38A02	CruiserMaxx	52.2	42	2.0					61.0
Dyna-Gro Seed	S35RY83	Acceleron/Imidacloprid	51.1	37	2.0					59.8
Chemgro	C3647R2	Starburst IM	51.1	35	1.5					
Doebler's	RPM® DB3513RR™	Gaucho/Evergol /Allegiance	50.9	33	2.0					
Hisoy	HS 33A14	CruiserMaxx	50.1	36	2.0					58.3
Channel	3207R2	Aceleron	50.0	37	2.0					
Doebler's	RPM® DB3312RR™	Gaucho/Evergol /Allegiance	50.0	37	2.0					58.1
Mycogen	5N385R2	CruiserMaxx	49.5	39	2.0					
Dyna-Gro Seed	S31RY93	Acceleron/Imidacloprid	49.5	32	1.5					58.8
Hisoy	HS 39A14	CruiserMaxx	49.5	38	2.5					59.4
NK Brand	S34-Z1	CruiserMaxx	49.1	38	2.0					
Channel	3506R2	Aceleron	48.9	37	1.5					
Pioneer	93Y84		48.9	35	2.0					
Dyna-Gro Seed	S36RY24	Acceleron/Imidacloprid	48.3	39	2.0					
Doebler's	RPM® DB3813RR™	Gaucho/Evergol /Allegiance	44.7	34	2.0					
Mean			52.3	36	1.9					60.8
LSD (.05)			8.5							
LSD (.25)			5.0							
CV %			10.0							

Table 7. Non-RR Soybean Variety Performance in Centre County, 2013

Source	Entry	Seed Treatment	Yield, bu/A	Height (in.)	Maturity Date	Lodging (1-5, 1=best)	Seeds per lb.	Seed Quality (1-5, 1=best)	Crude Protein % @ 13% H2O	Oil % @ 13% H2O	2 Yr Avg. Yield, bu/A (2012-13)	3 Yr Avg. Yield, bu/A (2011-13)
Crissinger Seeds	360 SB	Rancona, MetaStar, Storcide II, Macho 600ST	62.2	33	23-Sep	2.0	2987	1.5			61.3	62.2
Hisoy*	34A16	CruiserMaxx	57.5	39	24-Sep	2.0	2855	1.5				
Ohio State University	FG5	Untreated	56.6	35	25-Sep	2.3	1798	1.5				
Crissinger Seeds	FG1	Rancona, MetaStar, Storcide II, Macho 600ST	54.7	36	24-Sep	2.5	1932	2.0				
Chemgro*	Chemgro 3044	Encase	54.5	32	22-Sep	1.5	2752	1.5			60.9	
Mean			57.1	35	23-Sep	2.1	2465	1.6			61.1	62.2
LSD (.05)			7.2									
LSD (.25)			4.2									
CV %			8.2									

*RR Variety used as check

Table 8. Non-RR Soybean Variety Performance in Lancaster County, 2013

Source	Entry	Seed Treatment	Yield, bu/A	Height (in.)	Lodging (1-5, 1=best)	Seeds per lb.	Seed Quality (1-5, 1=best)	Crude Protein % @ 13% H2O	Oil % @ 13% H2O	2 Yr Avg. Yield, bu/A (2012-13)	3Yr Avg. Yield, bu/A (2011-13)
Stine	31LD23		79.3	26	1.0	2248	2.5				
Schillinger	e3692S	CruiserMaxx	73.2	34	1.5	2624	3.0			68.4	
Schillinger	389F.YC	CruiserMaxx	70.6	34	1.5	2522	2.5			63.8	
Schillinger	e3782S	CruiserMaxx	70.3	29	2.0	2242	2.5			64.8	
Schillinger	e3792	CruiserMaxx	70.2	27	1.0	2467	2.5				
Schillinger	e3553	CruiserMaxx	68.9	36	1.5	2352	2.0				
Dyna-Gro Seed	S42LL63	Acceleron/Imidacloprid	68.7	32	1.5	2752	2.5				
Crissinger	440 STS SB	Rancona, MetaStar, Storcide II, Macho 600ST	68.4	27	1.5	2820	2.0			65.0	62.2
FS*	34A16	CruiserMaxx	67.2	32	1.0	2495	2.5				
Dyna-Gro Seed	S38LL54	Acceleron/Imidacloprid	67.0	32	1.5	2310	3.0				
Dyna-Gro Seed	S39LL03	Acceleron/Imidacloprid	66.8	31	1.0	2594	2.0				
OSU	FG5	Untreated	66.2	33	2.0	1753	2.5				
Stine	30LC28		66.1	34	1.5	2794	2.5				
Chemgro*	C3044R2	Encase	66.1	27	1.5	2316	2.5			65.2	
Dyna-Gro Seed	S34LL73	Acceleron/Imidacloprid	64.6	31	1.0	2558	3.0				
Crissinger	390 SB	Rancona, MetaStar, Storcide II, Macho 600ST	64.5	32	1.0	1920	2.5			62.7	59.3
Stine	27LD00		64.2	28	1.5	2428	3.0				
Mean			68.4	31	1.4	2423	2.5			65.0	60.7
LSD (.05)			7.1								
LSD (.25)			4.1								
CV %			7.7								

*RR Variety used as check

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Issued in furtherance of Cooperative Extension work, Acts of Congress May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture and The Pennsylvania Legislature. T.R. Alter, Director of the Cooperative Extension Service, The Pennsylvania State University.

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This research was supported in part by funds supplied by The Pennsylvania Soybean Promotion Board.

