2019 Soybean Field Crop Trials Results

Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

Each year Minnesota Agricultural Experiment Station scientists conduct performance tests of appropriately adapted public and private soybean entries. Companies are charged a fee for each entry they enter to partially cover the costs of conducting these tests. One of the stipulations of the testing program is that the company is marketing or intends to begin marketing the entry in the next growing season. This information is also available electronically at www.soybeans.umn.edu.

The 2019 growing conditions could be described as challenging for much of the growing season across Minnesota. Record-level rainfall was experienced in much of the state and, generally, test sites received excessive precipitation throughout much of the growing season. Areas near Crookston experienced less rainfall in June, and excessive precipitation during the fall season. Planting of trials was a little later than normal at several sites, but other sites were planted on time. Generally, plant growth and development in trials was average to good at most sites. Exceptions include the Callaway, Moorhead and Shelly sites that received too much rainfall and excessively saturated soil conditions. **Unfortunately the trials at Moorhead and Callaway were lost to excessive precipitation in the fall, preventing timely harvest. The far northern and northern transgenic tests were also lost in Crookston this year because of excessive iron deficiency chlorosis at this field site. Two of the three planted locations for the northern transgenic test were lost, and therefore results from this test are not being provided in this report (Table 2). Data from one location is not reliable enough for reporting of variety trials.**

Tables 1 to 4 provide results from tests of available conventional, special purpose and transgenic entries adapted to the far northern, northern, central and southern production zones. The map shows test locations and zone boundaries. All of these tests were planted between May 15 and June 3 at planting rates of 160,000 seeds/acre.

Location	2019 Planting Date
Callaway	May 17
Crookston	May 17
Danvers	May 28
Fairfax	June 3
Gary	June 2
Glyndon	May 15
Lamberton	May 16
Moorhead	May 31
Morris	May 30
Roseau	May 18
Rosemount	May 26
Shelly	May 20
Thief River Falls	May 18
Waseca	May 15
Westbrook	June 3

Herbicides were used as necessary for good weed control. Row spacings were 10 inches at Roseau, Callaway, Moorhead, Shelly, Thief River Falls and Gary; 12 inches at Crookston; and 30 inches at all other locations. Plots were machine harvested using a small plot combine.

Tables 5 to 10 provide characteristics and performance data from special-purpose soybean entry tests. These tests were conducted to provide reliable data for growers who are interested in producing special-purpose soybeans, which are typically grown under contract.

Locations of 2019 soybean trials.

Table 11 provides important characteristics of publicly developed entries in the 2019 tests as well as those for which seed is available.

Tables 12 to 14 provide results from the performance tests of soybean cyst nematode (SCN) resistant entries in infested field sites near Callaway, Danvers, Downer, Fairfax, Lamberton, Rosemount and Waseca. SCN pressure should be gauged by comparing a susceptible check to resistant varieties within that same range of maturity (+/- 5 days).

Tables 15 displays results from greenhouse tests conducted by the Nematology Laboratory at the Univer-

sity of Minnesota Southern Research and Outreach Center in Waseca, MN. Plants were grown in soil inoculated with an HG type 0 (race 3) population of soybean cyst nematode.

To better understand and use the data provided in these tables, please carefully read the following additional information.

Seed Treatments and Transgenic Traits

Entrants were allowed to enter treated seed in 2019. The type of seed treatment, as provided by the originator, is designated as follows:

AC = Acceleron
AFII = AgriShield F+I with ILeVO
CM = Cruiser Maxx
CMVC = Cruiser Maxx + Vibrance + Clariva pn
MA = Maximum ArmourGuard
Met/Azo = Metalaxyl/Azoxystrobin
RAPVI = Redigo + Allegiance + Poncho/Votivo + ILeVO

Research indicates that under some conditions seed treatments can affect the final yield. The exact situations are not always clear but when comparing entries note if a seed treatment was used on the seed being tested.

In some tables the transgenic trait is indicated in a separate column using the following designations:

CV = conventional variety (non-transgenic)
LL = LibertyLink (glufosinate resistant)
GT = glyphosate tolerant
R2 = Roundup Ready 2 Yield (glyphosate resistant)
R2X = Roundup Ready 2 Xtend
STS = sulfonylura tolerant
LLGT27 = tolerance to Liberty, glyphosate, and HPPD/Group 27 herbicides
GT27 = tolerance to glyphosate and HPPD/Group 27 herbicides

Relative Maturity and Calendar Dates of Maturity

Soybeans are photoperiod sensitive; that is, they respond to changing day length. The actual calendar date of maturity achievement is affected by latitude. Each entry has a narrow range (about 100 miles) of north-south adaptation. Soybean yield and quality are best achieved when physiological maturity occurs before a hard frost. Maturity is determined visually by noting the calendar date when 95 percent of the pods show their genetically programmed mature color. The dates for 2019 are provided in the tables under the column heading "Maturity Date." Harvest dates are typically 7 to 14 days later depending upon drying conditions. Almost all entries were essentially mature before a hard frost.

Relative maturity ratings are also provided for each entry. These ratings consist of a number for the maturity group designations (000, 00, 0, 1, 2) followed by a decimal and another number, ranging from 0-9, which indicates a ranking within each maturity group. For example the entry MN0101 indicates a 0.1, making it an early group 0, while MN0901, with a 0.9 rating, is the latest group 0. The values for public entries are developed after observing them for several years in many locations. Relative maturity ratings for private entries in these tables were provided by their originators and were developed in a similar manner.

Yield

Because maturity is a very important attribute, entries are ordered in the tables according to their actual 2019 calendar date of maturity.

Later maturing entries usually can be expected to have higher yields than earlier maturing types. If you wish to compare yields, do so only between entries with similar calendar dates of maturity, usually within 3 to 5 days. More reliable comparisons can be made using yields from several consecutive years. All yield determinations were made from replicated tests harvested with a plot combine. Multi-location data is necessary for determining true differences between varieties, and therefore only multi-location averages are reported.

The yield information is presented as a percent of the mean of the test. The actual mean value is given at the bottom of each table. Values over 100 indicate the entry had a yield greater than the mean while those less than 100 have a yield less than the mean.

LSD values associated with data in these tables are measures of variability within the trials. The LSD numbers beneath the yield columns indicate whether the difference between yields is due to genetics or other factors, such as environmental variation and measurement error. If yield differences between two entries equals or exceeds the LSD value, the higher-yielding entry probably was superior in yield. A difference less than the LSD value is probably due to environmental and/or measurement factors. The LSD values are given on the percent of mean data, not the actual yields. A 20% level of significance is used in all tables contained in this report. This means that there is a 20% probability that yield differences exceeding the stated LSD are not true yield differences.

Chlorosis

Chlorosis is a yield-limiting condition of soybeans grown in alkaline soils with high calcium carbonate or calcium sulfate ions present, making iron unavailable and causing soybean plants to turn yellow. This yellowing is visually scored on a 1 to 5 scale,

where 1 indicates no yellowing and 5 indicates severe yellowing and necrosis that may even include death of the plant.

Research has shown that for every unit increase in chlorosis, a 20% reduction in yield may occur. For example, a plot rated at 3 may yield 20% less than a plot given a rating of 2. All iron deficiency chlorosis (IDC) ratings in tables are from tests conducted on high lime (high pH) soils near Danvers, MN in 2019. Comparing chlorosis scores of entries allows you to estimate how well they perform relative to each other. Actual chlorosis ratings can vary depending on the specific site and year of test. Because of this high level of variability, it is usually very difficult to identify the best performing entries. Producers with a known history of IDC problems may find it more useful to avoid entries with the most severe (4 or 5) IDC ratings. Different organizations may use different scales or descriptions. A comparison of three different chlorosis rating systems follows.

Numerical Score		Rating
1-5 scale	1-9 scale	
1 to 2	1 to 2.5	Tolerant (T)
2.1 to 3	2.6 to 5	Moderately Tolerant (MT)
3.1 to 4	5.1 to 7.5	Moderately Susceptible (MS)
4.1 to 5	7.5 to 9	Susceptible (S)

Protein and Oil

Protein and oil values were determined from mature seed using near infrared reflectance spectroscopy. The tabled values are for the 2019 season only. Protein and oil results are presented on a percent of the mean for each test. The actual mean values, expressed on a 13% moisture basis, are given at the bottom of each table. Values over 100 indicate the protein and/or oil contents of the entry are greater than the mean value while those less than 100 have protein and/or oil contents less than the mean. Absolute values of protein and oil can vary from year to year. The following formula is used to adjust the protein and oil values to another moisture basis.

$$\frac{\text{100-desired moisture}}{87} \times \text{protein or oil value given in the table}$$

The value of a bushel of soybeans (APV) based on its oil and protein content can be calculated by:

$$APV = 60\,[Po\,(X) + \frac{Pm\,(Y)}{.44}]$$

Where:

APV = Approximate value of a bushel of soybeans

Po = soybean oil price (in $ per pound)

Pm = price of 44% meal (in $ per pound)*

X = oil content at 13% moisture (in decimals)

Y = protein content at 13% moisture (in decimals)

And:

$$\frac{\text{*price of meal \$ / ton}}{2{,}000} = \text{\$ / pound}$$

The value of an acre of soybeans can be calculated by multiplying the APV by the yield in bushels per acre.

Phytophthora

Phytophthora root rot is a soil-borne disease that occurs in heavy wet soils. Infection generally occurs during germination. Phytophthora root rot can cause significant yield reductions if susceptible varieties are planted in poorly drained, infested fields. Variety selection is the best defense against this yield reducing pathogen. There are many known pathotypes (races) of this fungus, and therefore it is important to know which are present in a particular field. Genes can be incorporated into varieties to provide resistance to races present in a field. Soybean varieties that have specific resistance genes (or gene) provide some level of protection, but race-specific resistance genes do not guarantee protection against infection and yield loss because so many different races exist. Research indicates that Rps3a and Rps6 provide the broadest protection to Phytophthora races currently present in soybean fields in the Midwest.

Some published information refers to Phytophthora "tolerance" or "field resistance," which is not race-specific and should not be confused with race-specific resistance. It is possible that a certain level of field tolerance can provide yield protection even when the race-specific genes are not effective. Reliable tests for tolerance have not yet been fully developed.

Tables included in this report indicate which Phytophthora gene or genes is/are present in each entry. This information was provided by the originator. A "S" indicates a variety is expected to be susceptible to all races. A "NS" indicates that a Phytophthora gene was not specified by the originator.

Soybean Cyst Nematode

Soybean Cyst Nematode (SCN) is a microscopic round worm that infects and reproduces in soybean roots. It was first identified in Minnesota in 1978 and is now known to occur in most Minnesota counties where soybeans are grown. Both the area of infestation and number of nematodes per unit of soil appear to be increasing. Several races of this pest are known to occur in Minnesota. When SCN numbers are high (> than 5,000 eggs/100 cc soil), significant yield losses can occur. Rotations to non-host crops and planting of resistant varieties can assist in reducing nematode populations as well as reducing the SCN's impact on yield.

Yield performance results of susceptible (S), moderately susceptible (MS), moderately resistant (MR) and resistant (R) entries planted in infested fields in northern, central and southern Minnesota are provided in Tables 12 to 14. The source for SCN resistance for each entry was provided by the originator. In Table 15 the resistance ratings were given based on a greenhouse bioassay with five replicates using an HG Type 0 (Race 3) SCN population. Each container (one plant) was inocu-

lated with 4000 SCN eggs. After 30 days a female index (FI) was calculated for each entry using Lee 74 as the susceptible check. FI = (# of cysts on entry/# of cysts on Lee 74) x100. If the FI was < 11%, an entry was considered R. If the FI was 11–30%, it was considered MR. If the FI was 30-60%, it was considered MS, and greater than 60% S. These are fairly arbitrary cutoffs, and thus it is important to look at the actual FI values to judge the level of resistance. Comparison to varieties known to have a good level of resistance is also advisable.

For proper management of fields with SCN, it is recommended that entries with an R rating be planted. If the SCN population numbers are relatively low (<1500 eggs/100 cm3) an entry with an MR rating might be considered. Entries with S and MS ratings should not be considered for planting in fields where SCN is present at levels greater than 200 eggs/100 cm^3. Some entries are rated as tolerant, however no data from the northern United States has verified the usefulness of tolerant entries in maintaining yield and reducing SCN numbers.

Management information is available from the web site www.soybeans.umn.edu or from the Minnesota Soybean Research and Promotion Council, 151 St. Andrews Court, Suite 710, Mankato, MN 56001, 1-888-896-9678, www.mnsoybean.org.

White Mold

White mold, also known as Sclerotinia stem rot, develops in infested fields when high relative humidity and moderate temperatures occur during soybean flowering. Planting less susceptible entries in wider row spacings or at lower populations is the most effective method of reducing the severity of white mold. Accurate ratings for resistance to white mold are difficult to obtain because both infection and disease development are dependent on weather conditions. Because of this variability, performance can change significantly among locations and years depending on the interaction of plant development, precipitation, relative humidity, and temperature. White mold severity also tends to be greater if lodging occurs. Growers concerned about performance in the presence of white mold should select varieties that show consistently less white mold during several years of testing. MN0091 and MN0701 are public varieties with better than average resistance to white mold.

Brown Stem Rot

Brown stem rot (BSR) is a fungal disease that can cause yield losses in certain situations. The disease occurs most frequently when soybeans follow soybeans but can occur where soybeans are planted every other year. Resistant entries, or longer rotations, assist in the management of this disease. MN0304, MN0902CN, MN1302, Freeborn and IA2008R are available public varieties with resistance to BSR. Some information refers to "tolerance" or "field resistance." Reliable tests for tolerance or field resistance have not yet been developed.

Special-Purpose Entries

There continues to be interest in producing soybeans with special characteristics important to specialty food product manufacturers, such as tofu, natto, miso and soy milk. Soybean scientists previously developed some of these special-purpose entries, which were general releases, but more recently entries have been released under exclusive or nonexclusive licenses to specific companies who then contract with growers for production. For further information contact Minnesota Crop Improvement Association at web site www.mncia@tc.umn.edu or telephone number 612-625-7766.

Authors and Researchers

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Test plot establishment and management are supervised by Bob Bouvette, Mark Hanson, Gerald Holz, Tom Hoverstad, Steve Quiring, Curtis Reese and Donn Vellekson.

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We appreciate our farm cooperators who provided access to on-farm land. The farm cooperators in 2019 were Keith Christensen (Thief River Falls), Corey Hanson (Gary), Elizabeth Johnson (Westbrook), Mike and Patrick O'Leary (Danvers), Tom Palmer (Fairfax), David Swanson (Moorhead), David and Craig Swenson (Shelly) and Bill Zurn (Callaway).

Names and email addresses of seed company representatives that entered varieties into the 2019 trials.

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Sevita International	John Van Herk	johnv@sevita.com
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Table 3. Performance and characteristics of transgenic, conventional and special purpose soybean entries evaluated in the central zone. Trials were conducted in Danvers, Morris and Rosemount.

Entry	Originator	Maturity Date	Yield % of Mean		% of Mean		Maturity Rating	Phyto. Gene	Chlorosis Score	Seed Treat	Trans. Trait
			2018	2019	Protein	Oil					
MK41	Richland IFC Inc	9/18	102	94	107	93	1.1	Rps1c	1.5	None	CV
MK0603	Richland IFC Inc	9/19	75	68	101	93	0.6	S	1.5	None	CV
MK0508	Richland IFC Inc	9/19	63	68	99	96	0.8	S	1.3	None	CV
MK808CN	Richland IFC Inc	9/19	91	81	99	103	0.8	Rps1c	1.7	None	CV
MK1016	Richland IFC Inc	9/19	72	69	102	98	1.0	S	1.5	None	CV
BS1282	Brushvale Seed Inc	9/21	—	97	102	99	1.2	S	1.7	None	CV
MK9101	Richland IFC Inc	9/21	88	84	105	93	1.1	Rps1a	1.8	None	CV
MK42	Richland IFC Inc	9/21	80	75	107	84	0.7	Rps1c	1.5	None	CV
AG10X9	Bayer Crop Science	9/24	—	109	98	99	1.0	Rps3a	1.7	AC	R2-Ext
AG11X8	Bayer Crop Science	9/26	103	106	100	100	1.1	Rps3a	1.3	AC	R2-Ext
MK146	Richland IFC Inc	9/26	97	97	105	100	1.1	S	1.7	None	CV
BS1512	Brushvale Seed Inc	9/29	95	93	102	103	1.3	Rps1k	1.8	None	CV
1218N	Viking Seed	9/29	104	103	101	99	1.2	Rps3a	1.5	None	CV
MN1410	MN AES	9/30	—	94	100	102	1.4	Rps1k	1.8	None	CV
AG14X0	Bayer Crop Science	9/30	—	103	102	104	1.4	Rps3a	2.0	AC	R2-Ext
BS1146	Brushvale Seed Inc	9/30	96	92	106	95	1.1	S	2.0	None	CV
BS1247	Brushvale Seed Inc	9/30	—	95	104	97	1.2	S	2.7	None	CV
AgriGold G1502RX	AgriGold	10/1	108	119	98	100	1.5	Rps1c	1.7	AFII	R2-Ext
159RXT	Anderson Seeds	10/1	109	109	98	98	1.5	Rps1c	1.7	None	R2-Ext
AG14X8	Bayer Crop Science	10/1	114	119	99	100	1.4	Rps3a	2.2	AC	R2-Ext
20X15	Peterson Farms Seed	10/1	—	107	99	99	1.5	Rps1c	1.8	Met,Azo	R2-Ext
O.1202N	Viking Seed	10/1	—	101	101	102	1.2	S	3.2	None	CV
MN1613CN	MN AES	10/1	—	91	100	98	1.6	Rps1a	2.3	None	CV
AG17X8	Bayer Crop Science	10/2	106	109	99	105	1.7	Rps1c	1.7	AC	R2-Ext
CZ 1850GTLL	BASF Agricultural Solutions LLC	10/2	—	116	98	106	1.8	Rps1k	1.7	RAPVI	LLGT27
CZ 1470GTLL	BASF Agricultural Solutions LLC	10/2	—	105	99	103	1.4	Rps1k	1.3	RAPVI	LLGT27
20EN15 (2015E)	P3 Genetics	10/2	—	106	99	100	1.5	Rps1c	1.3	Met,Azo	Enlist
19B18 (1918B)	P3 Genetics	10/2	—	107	98	105	1.8	Rps1c	2.0	Met,Azo	LLGT27
1518N	Viking Seed	10/2	98	112	100	100	1.5	S	1.8	CM	CV
18LG20	Anderson Seeds	10/2	—	109	97	101	1.8	Rps1c	3.0	None	LLGT27
CZ 1859GTLL	BASF Agricultural Solutions LLC	10/2	—	119	99	103	1.8	Rps1k	2.2	RAPVI	LLGT27
179RXT	Anderson Seeds	10/3	—	114	101	103	1.7	Rps1c	2.5	None	R2-Ext
180RXT	Anderson Seeds	10/3	—	107	97	103	1.8	Rps1c	2.0	None	R2-Ext
CZ 1660GTLL	BASF Agricultural Solutions LLC	10/4	—	113	100	102	1.6	Rps1k	1.7	RAPVI	LLGT27
CZ 1549GTLL	BASF Agricultural Solutions LLC	10/4	—	107	96	105	1.5	Rps1k	1.3	RAPVI	LLGT27
19EN20 (1920E)	P3 Genetics	10/4	—	96	97	105	2.0	Rps1c	1.3	Met,Azo	Enlist
2018N	Viking Seed	10/4	113	100	96	102	2.0	Rps1a	2.0	CM	CV
20LG20	Anderson Seeds	10/4	—	102	98	102	2.0	S	2.0	None	LLGT27
217RXT	Anderson Seeds	10/5	—	115	99	99	2.0	Rps1c	1.8	None	R2-Ext
AgriGold G2009RX	AgriGold	10/5	—	106	96	105	2.0	S	1.3	AFII	R2-Ext
AgriGold G1990RX	AgriGold	10/5	105	107	98	103	1.9	Rps1a+Rps3a	1.8	AFII	R2-Ext
CZ 2040GTLL	BASF Agricultural Solutions LLC	10/5	—	100	96	103	2.0	Rps1a	2.7	RAPVI	LLGT27
MK373	Richland IFC Inc	10/6	77	105	104	91	2.0	S	1.0	None	CV
2155N	Viking Seed	10/7	77	74	99	99	2.1	Rps1a	1.8	CM	CV
Mean		**9/29**	**57 Bu/A**	**54 Bu/A**	**34%**	**18%**			**1.8**		
LSD 20%		**2d**	**8%**	**8%**	**2%**	**5%**			**0.5**		

LSD numbers beneath yield columns indicate whether the difference between yield is due to genetics or other factors, such as variations in environment.
If a yield difference between two entries equals or exceeds the LSD value, the higher yielding entry probably was superior in yield.
A difference less than the LSD value is likely due to environmental factors.

Table 13. Performance and characteristics of soybean entries evaluated at soybean cyst nematode infested sites in the central zone. Trials were conducted at Danvers, Fairfax and Rosemount. SCN egg counts per 100 cm³ of soil were 280 at Danvers, 360 at Fairfax and 11,760 at Rosemount.

Entry	Originator	Maturity Date	Yield % of Mean 2018	Yield % of Mean 2019	% of Mean Protein	% of Mean Oil	Maturity Rating	Phyto. Gene	Chlorosis Score	SCN Rating	Seed Treat	Trans. Trait
1218N	Viking Seed	9/26	—	97	101	98	1.2	Rps3a	2.8	MS	CM	CV
MN1613CN	Minnesota AES	9/26	—	99	100	92	1.6	Rps1a	3.3	R	None	CV
MN1312CN	Minnesota AES	9/26	—	85	104	96	1.3	Rps1a	4.3	R	None	CV
AgriGold G1502RX	AgriGold	9/27	—	111	100	96	1.5	Rps1c	3.3	R	AFII	R2-Ext
159RXT	Anderson Seeds	9/27	103	113	99	95	1.5	Rps1c	2.3	R	None	R2-Ext
20X15	Peterson Farms Seed	9/27	—	98	102	101	1.5	Rps1c	2.5	MR	Met,Azo	R2-Ext
MN1410	Minnesota AES	9/28	—	91	101	102	1.4	Rps1k	4.0	S	None	CV
O.1202N	Viking Seed	9/28	—	105	103	96	1.2	S	4.0	MR	None	CV
MN1701CN	Minnesota AES	9/28	—	98	99	98	1.7	S	2.8	R	None	CV
179RXT	Anderson Seeds	9/28	—	108	104	98	1.7	Rps1c	2.8	MR	None	R2-Ext
1518N	Viking Seed	9/28	—	94	101	100	1.5	S	1.7	S	CM	CV
18LG20	Anderson Seeds	9/29	—	98	100	102	1.8	Rps1c	4.0	R	None	LLGT27
20EN15 (2015E)	P3 Genetics	9/29	—	104	101	100	1.5	Rps1c	3.2	MR	Met,Azo	Enlist
19B18 (1918B)	P3 Genetics	9/29	—	106	98	104	1.8	Rps1c	4.7	R	Met,Azo	LLGT27
F1909N LLGT+	Federal Hybrids	9/29	108	101	99	105	1.9	Rps1c	3.7	R	MA	GT27
MN1806CN	Minnesota AES	9/29	—	84	104	101	1.8	Rps1k	3.3	R	None	CV
180RXT	Anderson Seeds	9/30	—	96	100	102	1.8	Rps1c	4.8	MR	None	R2-Ext
P15A88X	Pioneer	10/1	—	100	97	106	1.5	Rps1k	3.2	NA[1]	None	R2-Ext
20LG20	Anderson Seeds	10/2	—	103	99	101	2.0	S	3.0	R	None	LLGT27
19EN20 (1920E)	P3 Genetics	10/2	—	102	98	103	2.0	Rps1c	3.0	R	Met,Azo	Enlist
F2109N LLGT+	Federal Hybrids	10/2	—	100	99	101	2.1	S	4.0	R	MA	GT27
217RXT	Anderson Seeds	10/2	84	106	100	101	2.0	Rps1c	2.7	MR	None	R2-Ext
2018N	Viking Seed	10/2	—	102	96	97	2.0	Rps1a	4.2	MR	CM	CV
F2190N R2X	Federal Hybrids	10/3	—	103	98	104	2.1	Rps1c	2.8	MR	MA	R2-Ext
M08-365100	Minnesota AES	10/3	—	97	99	105	1.8	S	4.8	R	None	CV
AgriGold G1990RX	AgriGold	10/7	—	103	100	101	1.9	Rps1a+Rps3a	2.8	R	AFII	R2-Ext
AgriGold G2009RX	AgriGold	10/7	—	98	98	98	2.0	S	2.8	R	AFII	R2-Ext
2155N	Viking Seed	NA[1]	—	97	101	96	2.1	Rps1a	2.7	S	CM	CV
Mean		**9/29**	**57 Bu/A**	**49 Bu/A**	**35%**	**18%**			**3.3**			
LSD 20%		**1d**	**6%**	**7%**	**2%**	**5%**			**1.1**			

[1]NA indicates SCN bioassay data was not available.

LSD numbers beneath yield columns indicate whether the difference between yield is due to genetics or other factors, such as variations in environment.

If a yield difference between two entries equals or exceeds the LSD value, the higher yielding entry probably was superior in yield.

A difference less than the LSD value is likely due to environmental factors.

[1]Variety was not mature on last date of data collection October 7.