2018 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 2018 growing conditions were fair to good throughout most of the season for much of Minnesota, although there were some major exceptions. Early in the season, around 85% of the Minnesota soybean crop was rated good to excellent by the USDA, but that number declined to 69% by September 17. Between 5 and 9% of the crop was rated as poor or very poor, which was caused by excessive precipitation in the southwestern part of the state, as well as by some spotty dry conditions in northwest Minnesota. At our trial locations, Lamberton experienced the most precipitation, being 46% more than the historical mean across the growing season. Lamberton received nearly twice as much precipitation in July in comparison to previous years. Waseca also received higher than average rainfall, but yields were still very high at our Waseca station. The Crookston and Thief River sites suffered from early season water deficits, particularly May through July, resulting in shorter plants and lower yields. Temperatures were generally near average across the whole state for most of the season with the exception of May, which was cooler than average early in the month, then warmer than average later in the month. The cooler temperatures and precipitation in late April and early May delayed planting by about seven to ten days.

Location	2018 Planting Date
Callaway	May 26
Crookston	May 23
Danvers	May 21
Downer	May 26
Fairfax	May 28
Gary	May 26
Lamberton	May 16
Moorhead	May 25
Morris	May 13
Roseau	May 31
Rosemount	June 1
Shelly	May 24
Thief River Falls	May 26
Waseca	May 17
Westbrook	May 27

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 13 and June 1 at planting rates of 160,000 seeds/acre.

Herbicides were used as necessary for good weed control. Row spacings were 10 inches at Roseau, Callaway, Moorhead, Shelly, Thief River Falls and Downer; 12 inches at Crookston; and 30 inches at all other locations.

Plots were machine harvested using a small plot combine. Unfortunately the trials at Downer, Moorhead and Gary were lost to an herbicide accident.The iron deficiency chlorosis screening nursery near Danvers, MN did not result in any observable symptoms for some of the tests. For this reason, IDC Tolerance scores are not displayed in the tables for the following tests: Far Northern Zone, Northern Zone, Special Purpose Northern Zone, Special Purpose Central Zone and all SCN tests.

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 2018 soybean trials.

Table 11 provides important characteristics of publicly developed entries in the 2018 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).

Table 15 displays results from greenhouse tests conducted by the Nematology Laboratory at the University 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 2018. The type of seed treatment, as provided by the originator, is designated as follows:

AC = Acceleron
AFII = AgriShield F+I with ILeVO
ARTA = ApronMaxx RTA
CC = Clariva Complete
CM = Cruiser Maxx
CMO = Cruiser Maxx w/OPTIMIZE
CMVC = Cruiser Maxx + Vibrance + Clariva pn
EPVI = EverGol + Poncho/VOTiVO + ILeVO
ISI = INTEGO Suite + ILeVO
MA = Maximum ArmourGuard
SCS = SmartCote Supreme

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)
R2-X = Roundup Ready 2 Xtend
STS = sulfonylura tolerant

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 2018 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 2018 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 2018. 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 2018 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:

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

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 ideally present in a field. It is that soybean variety carries a resistance gene to 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 entries can assist in reducing nematode populations as well as reducing its 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 inoculated 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 < 10%, an entry was considered R. If the FI was 10 – 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 cm^3) 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 website www.mncia@tc.umn.edu or telephone number 612-625-7766.

Project Managers

A. Lorenz, S. Naeve, A. Killam and D. Weston.

Test Plot Research

Bob Bouvette, Ron Faber, Curtis Reese, Mark Hanson, Gerald Holz, Tom Hoverstad, Steve Quiring and Donn Vellekson supervised test plot establishment and management.

Names and email addresses of seed company representatives that entered varieties into the 2018 trials.

Company	Rep Name	Contact Email
AgriGold	Justin Warren	justin.warren@agrigold.com
Anderson Seeds	Kelsey Anderson	kelsey.anderson528@gmail.com
Bayer Crop Science	Harmon Wilts	harmon.wilts@bayer.com
Blue Horizon, Inc.	Kanan Suzuya	kanan@bhorizon.net
Brushvale Seed, Inc.	Tessa Mohs	tessa@brushvaleseed.com
Credenz	Nick Weidenbenner	nick.weidenbenner@basf.com
Dairyland Seed	Rod Moran	rmoran@dairylandseed.com
Federal Hybrids	Dan Swalla	dan.swalla@federalhybrids.com
Golden Harvest	Roger Plooster	roger.plooster@syngenta.com
Minnesota Ag Experiment Station (Minnesota AES)	Roger Wippler	wippl002@umn.edu
NK	Mike Schultz	michael.schultz@syngenta.com
Peterson Farms Seed	Dennis Schultz	dennis@petersonfarmsseed.com
Pioneer	Mitch Hoekstra	mitchh@arvig.net
Prairie Brand Seeds	Rod Moran	rmoran@dairylandseed.com
Proseed, Inc.	Keith Peltier	proseed@gondtc.com
Richland IFC, Inc.	Matt Bohn	matt@richlandifc.com
Sevita International	John Van Herk	johnv@sevita.com
Viking Seed	Jake Hansen	jake@alseed.com

Table 1. Performance and characteristics of transgenic, conventional and special purpose soybean entries evaluated in the far northern zone. Trials were conducted in Crookston, Roseau and Thief River Falls.

Entry	Originator	Maturity Date	Yield % of Mean		% of Mean		Maturity Rating	Phyto. Gene	Chlorosis Score[1]	Seed Treat	Trans. Trait
			2017	2018	Protein	Oil					
DSR-0200/R2Y	Dairyland Seed	9/12	—	92	99	98	0.2	Rps1c	—	CM	R2
MN0083	Minnesota AES	9/12	78	90	105	97	00.8	Rps 6	—	None	CV
M10-207102	Minnesota AES	9/12	—	103	107	93	0.0	Rps1c	—	None	CV
50-10	Proseed	9/14	117	106	100	105	0.1	Rps1c	—	Other	R2
18X008N	Peterson Farms Seed	9/14	77	109	98	103	0.8	Rps1k	—	None	R2X
10-08	Proseed	9/15	—	95	97	101	00.8	Rps1c	—	Other	R2
XT 60-09	Proseed	9/16	116	103	98	97	00.9	Rps1k	—	Other	R2X
DSR-0225/R2Y	Dairyland Seed	9/16	—	100	98	101	0.1	Rps1c	—	CM	R2
16R01	Peterson Farms Seed	9/16	—	95	98	106	0.1	Rps1c	—	None	R2
PB-00928R2	Prairie Brand Seed LLC	9/19	—	106	100	98	0.1	Rps1c	—	CM	R2
DSR-C999/R2Y	Dairyland Seed	9/19	—	106	100	98	00.9	Rps1c	—	CM	R2
Mean		**9/14**	**63 (bu/a)**	**42 (bu/a)**	**33%**	**17%**			**—**		
LSD 20%		**2d**	**7%**	**7%**	**2%**	**3%**			**—**		

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]Disease nursery did not produce observable symptoms.

Table 2. Performance and characteristics of transgenic, conventional and special purpose soybean entries evaluated in the northern zone. Trials were conducted in Crookston and Shelly.

Entry	Originator	Maturity Date	Yield % of Mean		% of Mean		Maturity Rating	Phyto. Gene	Chlorosis Score[1]	Seed Treat	Trans. Trait
			2017	2018	Protein	Oil					
M10-207102	Minnesota AES	9/10	—	95	105	93	0.0	Rps1c	—	None	CV
DSR-0225/R2Y	Dairyland Seed	9/14	98	107	99	109	0.1	Rps1c	—	CM	R2
SVX18T00	Sevita International	9/14	—	92	106	106	0.2	S	—	CM	CV
M06R-614008	Minnesota AES	9/15	—	101	98	102	0.5	S	—	None	GT
DSR-0397/R2Y	Dairyland Seed	9/16	—	113	99	101	0.3	S	—	CM	R2
XT 802	Proseed	9/16	—	108	96	98	0.2	Rps3a	—	Other	R2X
MK0249	Richland IFC Inc	9/16	—	83	93	101	0.2	S	—	None	CV
DSR-0418/R2Y	Dairyland Seed	9/17	93	97	101	98	0.4	Rps1c	—	CM	R2
17X04N	Peterson Farms Seed	9/18	111	106	100	100	0.4	Rps3a	—	None	R2X
SVX18T01	Sevita International	9/18	—	95	105	98	0.3	S	—	CM	CV
18X07N	Peterson Farms Seed	9/20	101	100	97	99	0.7	Rps1c	—	None	R2X
MK0603	Richland IFC Inc	9/21	—	83	102	93	0.6	S	—	None	CV
DSR-0777/R2Y	Dairyland Seed	9/23	—	114	100	99	0.7	Rps1c	—	CM	R2
M10-218053	Minnesota AES	9/23	97	100	103	102	0.8	S	—	None	CV
XT70-60	Proseed	9/24	—	107	97	101	0.6	Rps1c	—	Other	R2X
Mean		**9/18**	**68 bu/a**	**57 bu/a**	**33%**	**17%**			**—**		
LSD 20%		**2d**	**6%**	**8%**	**2%**	**3%**			**—**		

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]Disease nursery did not produce observable symptoms.

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	Maurity Date	Yield % of Mean		% of Mean		Maturity Rating	Phyto. Gene	Chlorosis Score	Seed Treat	Trans. Trait
			2017	2018	Protein	Oil					
MK41	Richland IFC Inc	9/7	73	102	105	96	1.1	Rps1c	1.5	None	CV
M06R-614008	Minnesota AES	9/7	—	90	99	101	0.5	S	1.5	None	GT
MK0508	Richland IFC Inc	9/8	59	63	100	96	0.8	S	1.0	None	CV
MK0603	Richland IFC Inc	9/8	71	75	102	93	0.6	S	2.0	None	CV
BS0858	Brushvale Seed Inc	9/9	—	101	102	103	0.8	S	2.0	None	CV
MK1016	Richland IFC Inc	9/9	59	72	102	97	1.0	S	1.0	None	CV
MK42	Richland IFC Inc	9/9	62	80	107	94	0.7	Rps1c	2.0	None	CV
MK808CN	Richland IFC Inc	9/10	80	91	98	100	0.8	Rps1c	1.0	None	CV
SVX18T05	Sevita International	9/11	—	97	100	104	0.9	S	3.5	CM	CV
MK9101	Richland IFC Inc	9/11	71	88	101	98	1.1	Rps1a	1.5	None	CV
DSR-0988/R2Y	Dairyland Seed	9/14	101	108	97	101	0.9	Rps1c	1.0	CM	R2
PB-0987R2	Prairie Brand Seed LLC	9/14	—	101	96	101	0.9	Rps1c	2.0	CM	R2
BS1512	Brushvale Seed Inc	9/15	98	95	103	101	1.3	Rps1k	2.5	None	CV
AG09X9	Bayer Crop Science	9/15	—	105	100	97	0.9	Rps1k	2.0	AC	R2X
PB-1257R2	Prairie Brand Seed LLC	9/15	110	102	97	102	1.2	Rps1c	1.5	CM	R2
SVX18T04	Sevita International	9/15	—	90	101	103	0.9	S	2.5	CM	CV
1218N	Viking Seed	9/15	—	104	101	100	1.2	S	2.0	None	CV
DSR-1120/R2Y	Dairyland Seed	9/16	84	104	99	106	1.1	Rps1k	3.5	CM	R2
AG11X8	Bayer Crop Science	9/16	121	103	99	99	1.1	Rps3a	2.5	AC	R2X
MK146	Richland IFC Inc	9/16	—	97	105	97	1.1	S	1.0	None	CV
BS1146	Brushvale Seed Inc	9/17	—	96	104	99	1.1	S	2.0	None	CV
XT 714	Proseed	9/17	—	108	99	105	1.4	Rps1k	1.0	Other	R2X
SVX18T06	Sevita International	9/17	—	98	102	100	1.0	S	3.0	CM	CV
SVX18T07	Sevita International	9/17	—	94	104	100	1.1	S	2.5	CM	CV
DSR-1313/R2Y	Dairyland Seed	9/18	104	104	97	100	1.3	Rps1c	1.5	CM	R2
DSR-1475/R2Y	Dairyland Seed	9/18	103	113	98	101	1.4	Rps1c	1.5	CM	R2
MN1312CN	Minnesota AES	9/18	87	95	101	95	1.3	Rps1a	1.5	None	CV
SVX18T10	Sevita International	9/18	—	96	99	102	1.3	S	1.5	CM	CV
G1502RX	AgriGold	9/19	—	108	98	99	1.5	Rps1c	1.0	AFII	R2X
159RXT	Anderson Seeds	9/19	—	109	97	99	1.5	Rps H1c	2.0	Other	R2X
CZ1418LL	Credenz	9/19	—	112	99	96	1.4	S	2.0	EPVI	LL
AG15X9	Bayer Crop Science	9/19	—	110	97	98	1.5	Rps1c	1.5	AC	R2X
1518N	Viking Seed	9/19	102	98	99	99	1.5	S	2.0	CM	CV
168RXT	Anderson Seeds	9/20	107	101	97	101	1.6	Rps1c	2.0	Other	R2X
CZ1738LL	Credenz	9/20	—	108	101	99	1.7	S	2.0	EPVI	LL
AG14X8	Bayer Crop Science	9/20	96	114	98	103	1.4	Rps1c	2.0	AC	R2X
19X14N	Peterson Farms Seed	9/20	—	112	98	99	1.4	Rps1c	1.0	None	R2X
SVX18T13	Sevita International	9/20	—	96	106	98	1.9	S	2.0	CM	CV
DSR-1526/R2Y	Dairyland Seed	9/21	117	110	99	103	1.5	Rps1c	1.5	CM	R2
DSR-1721/R2Y	Dairyland Seed	9/21	—	107	99	104	1.7	Rps1k	1.5	CM	R2
SVX18T09	Sevita International	9/21	—	93	103	93	1.2	S	2.5	CM	CV
DSR-1870/R2Y	Dairyland Seed	9/22	114	114	97	104	1.8	Rps1c	1.0	CM	R2
AG17X8	Bayer Crop Science	9/22	104	106	99	102	1.7	Rps1c	1.0	AC	R2X
AG20X9	Bayer Crop Science	9/22	—	102	98	99	2.0	Rps1c	3.0	AC	R2X
MN1806CN	Minnesota AES	9/22	—	92	102	101	1.8	Rps1k	1.0	None	CV
DSR-1870/R2Y	Dairyland Seed	9/22	114	114	97	104	1.7	Rps1c	2.0	CM	R2
DSR-1950/R2Y	Dairyland Seed	9/23	—	112	97	98	1.9	Rps1c	3.0	CM	R2
19X17N	Peterson Farms Seed	9/23	—	112	100	105	1.7	Rps1c	3.0	None	R2X
G1710RX	AgriGold	9/24	—	114	100	104	1.7	Rps1c	3.0	AFII	R2X
MK373	Richland IFC Inc	9/24	89	77	106	98	2.0	S	1.0	None	CV
188RXT	Anderson Seeds	9/25	110	105	99	102	1.8	Rps1a	1.5	Other	R2X
2018N	Viking Seed	9/25	—	113	98	104	2.0	S	2.5	CM	CV
G1990RX	AgriGold	9/26	—	105	100	102	1.9	Rps1a	2.5	AFII	R2X
217RXT	Anderson Seeds	9/26	111	122	99	102	2.0	Rps1c	2.0	Other	R2X
DSR-2110/R2Y	Dairyland Seed	9/26	109	98	99	96	2.1	Rps1c	1.5	CM	R2
2155N	Viking Seed	9/29	—	77	99	99	2.1	S	3.0	CM	CV
Mean		**9/18**	**60 bu/a**	**61 bu/a**	**35%**	**18%**			**1.9**		
LSD 20%		**2d**	**8%**	**8%**	**2%**	**3%**			**0.9**		

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 4. Performance and characteristics of transgenic, conventional and special purpose soybean entries evaluated in the southern zone. Trials were conducted in Waseca, Lamberton and Westbrook.

Entry	Originator	Maturity Date	Yield % of Mean 2017	Yield % of Mean 2018	% of Mean Protein	% of Mean Oil	Maturity Rating	Phyto. Gene	Chlorosis Score	Seed Treat	Trans. Trait
159 RXT	Anderson Seeds	9/15	—	94	98	100	1.5	Rps H1c	1.0	Other	R2X
DSR-1313/R2Y	Dairyland Seed	9/15	—	100	98	102	1.3	Rps1c	2.0	CM	R2
DSR-1475/R2Y	Dairyland Seed	9/16	—	102	98	100	1.4	Rps1c	2.5	CM	R2
G1502RX	AgriGold	9/17	—	87	98	100	1.5	Rps1c	1.5	AFII	R2X
DSR-1721/R2Y	Dairyland Seed	9/17	—	92	99	105	1.7	Rps1k	1.5	CM	R2
AG15X9	Bayer Crop Science	9/17	—	97	98	102	1.5	Rps1c	1.0	AC	R2X
MN1410	Minnesota AES	9/17	—	86	102	100	1.4	S	1.0	None	CV
168RXT	Anderson Seeds	9/19	103	109	99	101	1.6	Rps1c	2.0	Other	R2X
CZ1418LL	Credenz	9/20	—	113	103	95	1.4	S	1.5	EPVI	LL
DSR-1526/R2Y	Dairyland Seed	9/20	106	98	100	105	1.5	Rps1c	1.0	CM	R2
DSR-1870/R2Y	Dairyland Seed	9/20	108	99	97	105	1.8	Rps1c	1.0	CM	R2
AG17X8	Bayer Crop Science	9/21	95	96	100	101	1.7	Rps1c	1.0	AC	R2X
G1710RX	AgriGold	9/23	—	90	102	101	1.7	Rps1c	2.0	AFII	R2X
188RXT	Anderson Seeds	9/23	96	94	103	99	1.8	Rps1a	1.0	Other	R2X
DSR-1950/R2Y	Dairyland Seed	9/23	—	101	99	99	1.9	Rps1c	2.0	CM	R2
PB-1947R2	Prairie Brand Seed LLC	9/23	—	101	99	99	1.9	Rps1c	1.5	CM	R2
CZ1738LL	Credenz	9/24	—	114	103	99	1.7	S	1.0	EPVI	LL
AG20X9	Bayer Crop Science	9/24	—	103	98	97	2.0	Rps1c	2.0	AC	R2X
T2346	Brushvale Seed Inc	9/25	92	103	103	100	2.3	S	1.0	None	CV
DSR-2197/R2Y	Dairyland Seed	9/25	—	99	97	102	2.1	Rps1c	1.5	CM	R2
2018N	Viking Seed	9/25	100	102	97	102	2.0	S	1.0	CM	CV
G1990RX	AgriGold	9/26	—	103	101	99	1.9	Rps1a	1.0	AFII	R2X
217RXT	Anderson Seeds	9/26	111	117	100	100	2.0	Rps1c	1.0	Other	R2X
N2358	Brushvale Seed Inc	9/26	84	92	113	92	2.3	Rps1c	1.0	None	CV
DSR-2110/R2Y	Dairyland Seed	9/26	106	102	101	96	2.1	Rps1c	1.0	CM	R2
DSR-2330/R2Y	Dairyland Seed	9/26	101	100	101	102	2.3	Rps1k	1.0	CM	R2
AG21X9	Bayer Crop Science	9/26	—	100	95	103	2.1	Rps1c	1.0	AC	R2X
MK373	Richland IFC Inc	9/27	89	87	102	97	2.0	S	1.0	None	CV
AG23X9	Bayer Crop Science	9/28	—	109	96	100	2.3	Rps1c	1.0	AC	R2X
O.2518N	Viking Seed	9/30	—	94	104	97	2.5	S	1.5	None	CV
CZ2408LL	Credenz	9/31	—	109	98	104	2.4	Rps1k	1.0	EPVI	LL
2155N	Viking Seed	10/4	107	111	99	97	2.1	S	1.5	CM	CV
2188AT12N	Viking Seed	10/4	—	99	100	97	2.4	S	1.0	CM	CV
Mean		**9/23**	**65 bu/a**	**70 bu/a**	**34%**	**17%**			**1.3**		
LSD 20%		**1d**	**11%**	**7%**	**2%**	**2%**			**0.7**		

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 5. Characteristics of special purpose soybean entries evaluated in the northern zone. Trials were conducted in Crookston and Shelly.

Entry	Originator	Maturity Date	Special Characteristics	Hilum Color	Phyto. Gene	Seeds/lb	Trans. Trait
MN0083	Minnesota AES	9/10	Yield	Yellow	Rps6	3411	CV
M07-257111	Minnesota AES	9/13	Small	Yellow	Rps1a	4516	CV
M06-320039	Minnesota AES	9/13	High Protein	Yellow	Rps1a	3415	CV
UM3	Minnesota AES	9/13	Small	Yellow	Rps1a	6887	CV
M06-260048	Minnesota AES	9/15	Small	Yellow	Rps1a	5434	CV
MN0205SP	Minnesota AES	9/15	Small	Yellow	Rps1a	5244	CV
M08-450148	Minnesota AES	9/17	Small	Yellow	S	4281	CV
M08-455079	Minnesota AES	9/17	Small	Yellow	Rps1a	4181	CV
MN0303SP	Minnesota AES	9/18	Small	Yellow	Rps1a	5368	CV
MK1016SP	Richland IFC Inc	9/19	Small	Yellow	S	5566	CV
MN0310CN	Minnesota AES	9/20	SCN	Yellow	S	2807	CV
M08-369018	Minnesota AES	9/21	Small	Yellow	S	4253	CV
M08-354011	Minnesota AES	9/23	—	Yellow	S	3104	CV
Sheyenne	NDSU	9/23	High Yield	Yellow	Rps1c	2910	CV
MN0702CN	Minnesota AES	9/24	SCN	Yellow	Rps1k	3280	CV
MN0810CN	Minnesota AES	9/24	SCN	Yellow	S	3107	CV
M03-238028	Minnesota AES	9/24	Small	Yellow	Rps1a	5377	CV
M10-218053	Minnesota AES	9/26	Aphid Resistance	Black	S	3118	CV
M07-307086	Minnesota AES	9/28	High Protein	Yellow	S	2519	CV
M07-254043	Minnesota AES	9/28	Small, SCN	Yellow	S	4200	CV
M08-369100W	Minnesota AES	10/9	Small	Yellow	S	4961	CV

Table 6. Performance and characteristics of special purpose soybean entries evaluated in the northern zone. Trials were conducted in Crookston and Shelly.

Entry	Originator	Maturity Date	% of Mean			Chlorosis Score[1]
			Yield	Protein	Oil	
MN0083	Minnesota AES	9/10	109	99	102	—
M07-257111	Minnesota AES	9/13	103	100	104	—
M06-320039	Minnesota AES	9/13	87	112	90	—
UM3	Minnesota AES	9/13	83	97	99	—
M06-260048	Minnesota AES	9/15	104	96	102	—
MN0205SP	Minnesota AES	9/15	95	101	100	—
M08-450148	Minnesota AES	9/17	113	98	101	—
M08-455079	Minnesota AES	9/17	89	100	105	—
MN0303SP	Minnesota AES	9/18	88	98	100	—
MK1016SP	Richland IFC Inc	9/19	98	98	96	—
MN0310CN	Minnesota AES	9/20	102	102	97	—
M08-369018	Minnesota AES	9/21	110	100	100	—
M08-354011	Minnesota AES	9/23	109	98	104	—
Sheyenne	NDSU	9/23	122	94	103	—
MN0702CN	Minnesota AES	9/24	97	102	100	—
MN0810CN	Minnesota AES	9/24	114	101	97	—
M03-238028	Minnesota AES	9/24	101	100	102	—
M10-218053	Minnesota AES	9/26	118	98	103	—
M07-307086	Minnesota AES	9/28	114	108	94	—
M07-254043	Minnesota AES	9/28	85	102	98	—
M08-369100W	Minnesota AES	10/9	60	97	102	—
Mean		**9/20**	**47 bu/a**	**34%**	**17%**	**—**
LSD 20%		**2d**	**10%**	**2%**	**3%**	**—**

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]Disease nursery did not produce observable symptoms.

Table 7. Characteristics of special purpose soybean entries evaluated in the central zone. Trials were conducted in Danvers, Morris and Rosemount.

Entry	Originator	Maturity Date	Special Characteristics	Hilum Color	Phyto. Gene	Seeds/lb	Trans. Trait
M07-257111	Minnesota AES	9/6	Small	Yellow	S	4341	CV
M08-369018	Minnesota AES	9/8	Small	Yellow	S	4467	CV
MN1012SP	Minnesota AES	9/8	Small	Yellow	Rps1a	6520	CV
OAC-14-52C	Blue Horizon	9/9	—	Yellow	NS	2941	CV
BS0858	Brushvale Seed Inc	9/9	—	Yellow	S	2694	CV
M07-303013	Minnesota AES	9/9	Large	Yellow	S	1734	CV
MN0702CN	Minnesota AES	9/11	SCN	Yellow	Rps1k	3297	CV
M07-254043	Minnesota AES	9/11	Small, SCN	Yellow	S	5112	CV
MN0810CN	Minnesota AES	9/11	SCN	Yellow	S	3229	CV
M07-257020	Minnesota AES	9/12	SCN	Yellow	S	3563	CV
M06-322059	Minnesota AES	9/14	Large	Yellow	Rps1a	2311	CV
M07-244073	Minnesota AES	9/18	—	Yellow	S	3747	CV
M08-332003	Minnesota AES	9/19	High Protein	Buff	S	3066	CV
MN1410	Minnesota AES	9/19	Yield	Buff	S	2778	CV
M10-237102	Minnesota AES	9/20	—	Imperfect Black	Rps1a	3565	CV
MN1312CN	Minnesota AES	9/20	SCN	Yellow	Rps1a	2831	CV
BS1146	Brushvale Seed Inc	9/22	—	Yellow	S	2599	CV
BS1512	Brushvale Seed Inc	9/22	—	Yellow	Rps1k	2659	CV
M08-369100W	Minnesota AES	9/24	Small	Yellow	Rps1a	4968	CV

Table 8. Performance and characteristics of special purpose soybean entries evaluated in the central zone. Trials were conducted in Danvers, Morris and Rosemount.

Entry	Originator	Maturity Date	% of Mean			Chlorosis Score[1]
			Yield	Protein	Oil	
M07-257111	Minnesota AES	9/6	84	100	104	—
M08-369018	Minnesota AES	9/8	82	100	101	—
MN1012SP	Minnesota AES	9/8	65	99	95	—
OAC-14-52C	Blue Horizon	9/9	101	97	106	—
BS0858	Brushvale Seed Inc	9/9	109	100	102	—
M07-303013	Minnesota AES	9/9	100	104	97	—
MN0702CN	Minnesota AES	9/11	109	100	103	—
M07-254043	Minnesota AES	9/11	92	97	103	—
MN0810CN	Minnesota AES	9/11	100	101	97	—
M07-257020	Minnesota AES	9/12	100	98	101	—
M06-322059	Minnesota AES	9/14	100	102	99	—
M07-244073	Minnesota AES	9/18	108	99	104	—
M08-332003	Minnesota AES	9/19	97	110	91	—
MN1410	Minnesota AES	9/19	114	97	101	—
M10-237102	Minnesota AES	9/20	95	98	103	—
MN1312CN	Minnesota AES	9/20	110	98	98	—
BS1146	Brushvale Seed Inc	9/22	122	101	99	—
BS1512	Brushvale Seed Inc	9/22	120	100	100	—
M08-369100W	Minnesota AES	9/24	93	99	97	—
Mean		**9/14**	**50 bu/a**	**36%**	**17%**	**—**
LSD 20%		**1d**	**10%**	**2%**	**3%**	**—**

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]Disease nursery did not produce observable symptoms.

Table 9. Characteristics of special purpose soybean entries evaluated in the southern zone. Trials were conducted in Lamberton, Waseca and Westbrook.

Entry	Originator	Maturity Date	Special Characteristics	Hilum Color	Phyto. Gene	Seeds/lb	Trans. Trait
OAC-14-52C	Blue Horizon	9/10	—	Yellow	NS	2666	CV
M08-332003	Minnesota AES	9/14	High Protein	Buff	Rps1a	2534	CV
M07-2074210	Minnesota AES	9/20	Small, SCN	Yellow	Rps1a	4449	CV
M04-295008	Minnesota AES	9/21	Large, Edamame	Yellow	Rps1k	2171	CV
MN1806CN	Minnesota AES	9/22	SCN	Yellow	Rps1k	2720	CV
M08-365100	Minnesota AES	9/24	Yield	Imperfect Black	S	2760	CV
N2358	Brushvale Seed Inc	9/27	—	Brown	Rps1c	2717	CV
2188AT12N	Viking Seed	10/6	—	Yellow	S	2527	CV

Table 10. Performance and characteristics of special purpose soybean entries evaluated in the southern zone. Trials were conducted in Lamberton, Waseca and Westbrook.

Entry	Originator	Maturity Date	% of Mean			Chlorosis Score
			Yield	Protein	Oil	
OAC-14-52C	Blue Horizon	9/10	66	99	108	1.0
M08-332003	Minnesota AES	9/14	84	113	89	1.0
M07-2074210	Minnesota AES	9/20	80	96	101	1.0
M04-295008	Minnesota AES	9/21	103	99	97	2.0
MN1806CN	Minnesota AES	9/22	112	96	104	1.0
M08-365100	Minnesota AES	9/24	120	93	108	2.5
N2358	Brushvale Seed Inc	9/27	108	109	94	1.0
2188AT12N	Viking Seed	10/6	126	95	99	1.0
Mean		**9/22**	**56 bu/a**	**36%**	**17%**	**1.3**
LSD 20%		**1d**	**9%**	**2%**	**2%**	**0.71**

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 11. Characteristics of publicly developed general use soybean varieties entered in 2018 tests, and/or seed produced in Minnesota.

Entry	Originator	Maturity Rating	Hilum Color	Phyto. Gene	SCN Rating	Trans. Trait
IA1022	Iowa AES	1.9	Yellow	S	S	CV
IA1902CN	Iowa AES	1.9	Buff	NS	R	CV
IA2053	Iowa AES	2.0	Black	Rps1a	S	CV
IA2104	Iowa AES	2.2	Yellow	S	S	CV
IA2113RA12	Iowa AES	2.2	Yellow	S	S	CV
IA2104RA12	Iowa AES	2.3	Yellow	S	S	CV
MN0083	Minnesota AES	00.8	Yellow	Rps6	S	CV
MN0107	Minnesota AES	0.1	Yellow	Rps1k	S	CV
MN0310CN	Minnesota AES	0.3	Yellow	S	R	CV
MN0702CN	Minnesota AES	0.7	Yellow	Rps1k	R	CV
MN0808CN	Minnesota AES	0.8	Yellow	Rps1c	R	CV
MN0810CN	Minnesota AES	0.8	Yellow	S	R	CV
MN1011CN	Minnesota AES	1.0	Yellow	Rps1a	R	CV
MN1012SP	Minnesota AES	1.2	Yellow	Rps1a	S	CV
MN1311	Minnesota AES	1.3	Yellow	Rps1k	S	CV
MN1312CN	Minnesota AES	1.3	Yellow	Rps1a	R	CV
MN1410	Minnesota AES	1.4	Buff	S	S	CV
MN1613CN	Minnesota AES	1.6	Buff	Rps1a	R	CV
MN1701CN	Minnesota AES	1.7	Yellow	S	R	CV
MN1806CN	Minnesota AES	1.8	Yellow	Rps1k	R	CV
Traill	No Dakota AES	0.0	Yellow	S	S	CV
Henson	No Dakota AES	0.0	Buff	Rps1b	S	CV
Benson	No Dakota AES	0.4	Imperfect black	Rps3a	R	CV
ND1406HP	No Dakota AES	0.6	Yellow	S	S	CV
Sheyenne	No Dakota AES	0.7	Yellow	Rps1c	S	CV
ND17009GT	No Dakota AES	0.9	Brown	Rps4	S	GT
Roberts	So Dakota AES	0.6	Gray	Rps1k	S	CV
Codington	So Dakota AES	0.9	Black	Rps1a	S	CV
Brookings	So Dakota AES	1.7	Brown	Rps1k	S	CV
Davison	So Dakota AES	2.2	Black	Rps1a	S	CV

Table 12. Performance and characteristics of soybean entries evaluated at soybean cyst nematode infested sites in the northern zone. Trials were conducted at Callaway and Thief River Falls. SCN egg counts per 100 cm^3 were 3600 at Callaway. Egg counts were not available for Thief River Falls at time of publication.

Entry	Originator	Maturity Date	Yield % of Mean		% of Mean		Maturity Rating	Phyto. Gene	Chlorosis Score[1]	SCN Rating	Seed Treat	Trans. Trait
			2017	2018	Protein	Oil						
ND17009GT	North Dakota AES	9/14	—	78	102	98	00.9	Rps4	—	S	None	GT
M10-207102	Minnesota AES	9/14	—	82	101	96	0.0	Rps1c	—	S	None	CV
DSR-0225/R2Y	Dairyland Seed	9/15	—	93	103	104	0.1	Rps1c	—	S	CM	R2
M07-260028	Minnesota AES	9/15	—	98	103	97	0.0	S	—	S	None	CV
XT 802	Proseed	9/17	—	119	97	100	0.2	Rps3a	—	MR	Other	R2X
MN0310CN	Minnesota AES	9/24	94	86	105	98	0.3	S	—	R	None	CV
DSR-0418/R2Y	Dairyland Seed	9/25	116	103	100	99	0.4	Rps1c	—	MR	CM	R2
XT 806	Proseed	9/26	—	108	98	101	0.6	Rps3a	—	MR	Other	R2X
M08-362045L	Minnesota AES	9/26	—	104	97	101	0.8	Rps1k	—	R	None	CV
MK808CN	Richland IFC Inc	9/27	—	99	100	102	0.8	Rps1c	—	R	None	CV
PB-0987R2	Prairie Brand Seed LLC	9/28	—	102	97	101	0.9	Rps1c	—	MR	CM	R2
M08-354011	Minnesota AES	9/30	—	91	102	103	1.0	S	—	R	None	CV
DSR-0988/R2Y	Dairyland Seed	10/1	—	120	96	98	0.9	Rps1c	—	MR	CM	R2
SVX18T07	Sevita International	10/2	—	96	100	102	1.1	S	—	MR	CM	CV
AG09X9	Bayer Crop Science	10/3	—	121	98	102	0.9	Rps1k	—	MR	AC	R2X
Mean		**9/24**	**61 bu/a**	**40 bu/a**	**34%**	**17%**			**—**			
LSD 20%		**2d**	**8%**	**13%**	**7%**	**4%**			**—**			

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]Disease nursery did not produce observable symptoms.

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 520 at Danvers, 640 at Fairfax and 40 at Rosemount.

Entry	Originator	Maturity Date	Yield % of Mean 2017	Yield % of Mean 2018	% of Mean Protein	% of Mean Oil	Maturity Rating	Phyto. Gene	Chlorosis Score[1]	SCN Rating	Seed Treat	Trans. Trait
AG11X8	Bayer Crop Science	9/16	107	108	99	100	1.1	Rps3a	—	MR	AC	R2X
AG15X9	Bayer Crop Science	9/19	—	97	99	99	1.5	Rps1c	—	MR	AC	R2X
159RXT	Anderson Seeds	9/20	—	103	100	97	1.5	Rps H1c	—	MR	Other	R2X
AG14X8	Bayer Crop Science	9/20	99	99	99	101	1.4	Rps1c	—	MR	AC	R2X
MN1613CN	Minnesota AES	9/22	89	95	100	96	1.6	Rps1a	—	R	None	CV
168RXT	Anderson Seeds	9/23	114	99	98	101	1.6	Rps1c	—	MR	Other	R2X
F1909N LLGT+	Federal Hybrids	9/24	—	108	100	102	1.9	Rps1c	—	R	MA	Other
F195N RR2Y	Federal Hybrids	9/24	—	110	99	97	1.9	Rps1c	—	MR	MA	R2
188RXT	Anderson Seeds	9/25	98	107	102	100	1.8	Rps1a	—	MR	Other	R2X
F2170N R2X	Federal Hybrids	9/25	—	98	102	100	2.1	Rps1c	—	MR	MA	R2X
IA1022	Iowa AES	9/25	—	93	99	105	1.9	S	—	S	None	CV
217RXT	Anderson Seeds	9/26	115	84	101	100	2.0	Rps1c	—	MR	Other	R2X
F2190N R2X	Federal Hybrids	9/27	—	99	103	100	2.1	Rps1c	—	MR	MA	R2X
Mean		**9/23**	**59 bu/a**	**57 bu/a**	**34%**	**18%**			**—**			
LSD 20%		**1d**	**8%**	**6%**	**1%**	**2%**			**—**			

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]Disease nursery did not produce observable symptoms.

Table 14. Performance and characteristics of soybean entries evaluated at soybean cyst nematode infested sites in the southern zone. Trials were conducted at Fairfax, Lamberton and Waseca. SCN egg counts per 100 cm³ of soil were 640 at Fairfax. Egg counts at Lamberton and Waseca were not available at time of publication.

Entry	Originator	Maturity Date	Yield % of Mean 2017	Yield % of Mean 2018	% of Mean Protein	% of Mean Oil	Maturity Rating	Phyto. Gene	Chlorosis Score[1]	SCN Rating	Seed Treat	Trans. Trait
159 RXT	Anderson Seeds	9/16	—	94	101	96	1.5	Rps H1c	—	MR	Other	R2X
MN1701CN	Minnesota AES	9/17	88	96	101	100	1.7	S	—	R	None	CV
168RXT	Anderson Seeds	9/19	106	93	101	99	1.6	Rps1c	—	MR	Other	R2X
NK S18-H3X Brand	NK	9/19	—	102	99	101	1.8	S	—	MR	CC	R2X
GH1915X	Golden Harvest	9/20	—	108	97	102	1.9	Rps1c	—	R	CMVC	R2X
AG17X8	Bayer Crop Science	9/20	—	100	100	101	1.7	Rps1c	—	MR	AC	R2X
NK S20-J5X Brand	NK	9/20	—	101	101	100	2.0	Rps1c	—	MR	CC	R2X
NK S21-W8X Brand	NK	9/20	—	103	98	101	2.1	Rps1c	—	MR	CC	R2X
MN1806CN	Minnesota AES	9/20	90	86	103	100	1.8	Rps1k	—	R	None	CV
188RXT	Anderson Seeds	9/21	107	93	103	99	1.8	Rps1a	—	MR	Other	R2X
AG20X9	Bayer Crop Science	9/21	—	105	100	96	2.0	Rps1c	—	MR	AC	R2X
NK S18-G4X Brand	NK	9/21	—	107	98	99	1.8	Rps1c	—	MR	CC	R2X
M08-365100	Minnesota AES	9/21	—	95	99	103	1.8	S	—	R	None	CV
GH2230X	Golden Harvest	9/22	—	100	99	102	2.2	Rps1c	—	MR	CMVC	R2X
217RXT	Anderson Seeds	9/23	98	104	101	99	2.0	Rps1c	—	MR	Other	R2X
F2280NR2X	Federal Hybrids	9/23	—	98	100	101	2.2	Rps1k+Rps3a	—	MR	Other	R2X
F2109N LLGT+	Federal Hybrids	9/24	—	99	101	102	2.1	S	—	R	MA	Other
F2170N R2X	Federal Hybrids	9/24	—	101	102	98	2.1	Rps1c	—	MR	MA	R2X
AG21X9	Bayer Crop Science	9/24	—	103	97	102	2.1	Rps1c	—	MR	AC	R2X
F2190N R2X	Federal Hybrids	9/26	—	103	102	99	2.1	Rps1c	—	MR	MA	R2X
F2290N R2X	Federal Hybrids	9/26	—	109	97	102	2.2	Rps1c	—	R	MA	R2X
Mean		**9/21**	**60 bu/a**	**60 bu/a**	**33%**	**18%**			**—**			
LSD 20%		**1d**	**9%**	**8%**	**3%**	**2%**			**—**			

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]Disease nursery did not produce observable symptoms.

Table 15. Results of soybean cyst nematode greenhouse bioassay performed on soybean entries grown in 2018 SCN trials, all zones. Entries are sorted by originator and entry name.

Entry	Originator	SCN Resistance Source[1]	Greenhouse Test HG Type 0 (Race 3) FI	SCN Rating[2]
149RXT	Anderson Seeds	PI 88788	13	MR
168RXT	Anderson Seeds	PI 88788	12	MR
188RXT	Anderson Seeds	PI 88788	13	MR
217RXT	Anderson Seeds	PI 88788	16	MR
AG09X9	Bayer Crop Science	PI 88788	14	MR
AG11X8	Bayer Crop Science	PI 88788	12	MR
AG14X8	Bayer Crop Science	PI 88788	16	MR
AG15X9	Bayer Crop Science	PI 88788	17	MR
AG17X8	Bayer Crop Science	PI 88788	16	MR
AG20X9	Bayer Crop Science	PI 88788	11	MR
AG21X9	Bayer Crop Science	PI 88788	15	MR
DSR-0225/R2Y	Dairyland Seed	PI 88788	100	S
DSR-0418/R2Y	Dairyland Seed	PI 88788	12	MR
DSR-0988/R2Y	Dairyland Seed	PI 88788	23	MR
F1909N LLGT+	Federal Hybrids	PI 88788	9	R
F195N RR2Y	Federal Hybrids	PI 88788	11	MR
F209N E	Federal Hybrids	PI 88788	14	MR
F2109N LLGT+	Federal Hybrids	PI 88788	10	R
F2170N R2X	Federal Hybrids	PI 88788	11	MR
F2190N R2X	Federal Hybrids	PI 88788	11	MR
F2290N R2X	Federal Hybrids	Peking	9	R
GH1915X	Golden Harvest	PI 88788	7	R
GH2230X	Golden Harvest	PI 88788	21	MR
NK S18-G4X Brand	NK	PI 88788	13	MR
NK S18-H3X Brand	NK	PI 88788	11	MR
NK S20-J5X Brand	NK	PI 88788	15	MR
NK S21-W8X Brand	NK	PI 88788	20	MR
XT 802	Proseed	PI 88788	12	MR
XT 806	Proseed	PI 88788	13	MR
MK808CN	Richland IFC Inc	PI 88788	4	R
SVX18T07	Sevita International	PI 88788	14	MR
1940KN	Viking Seed	Peking	7	R
2340KN	Viking Seed	Peking	76	S

[1]Resistance source provided by originator. NS = SCN source not specified by provider.
[2]SCN resistance rating: R = resistant (FI less than 10%); MR = moderately resistant (FI 10-30%); MS = moderately susceptible (FI 31-60%); S = susceptible (FI greater than 60%).
Female index (FI) was calculated using Lee 74 as the susceptible check.