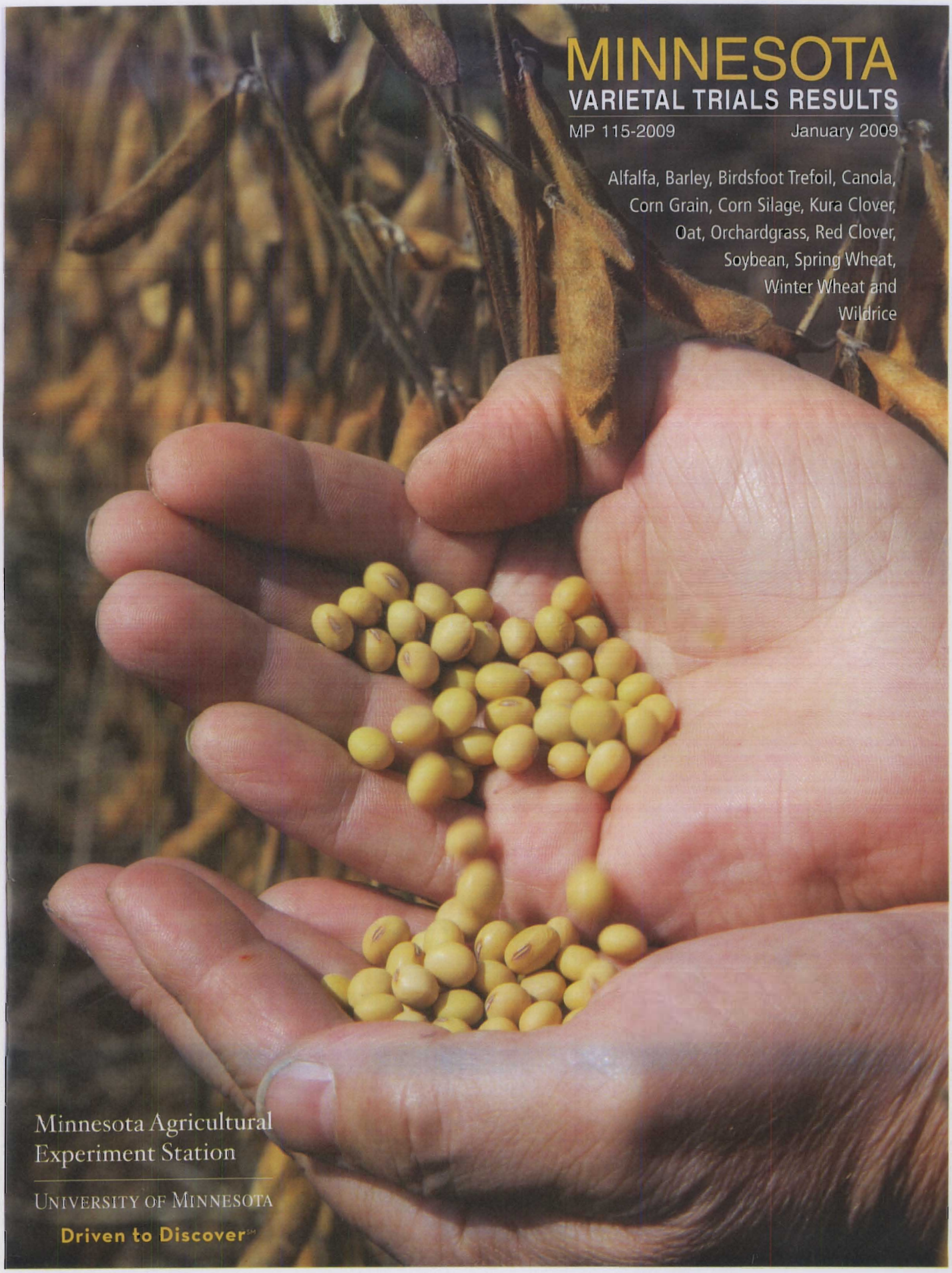

MINNESOTA
VARIETAL TRIALS RESULTS

MP 115-2009 January 2009

Alfalfa, Barley, Birdsfoot Trefoil, Canola, Corn Grain, Corn Silage, Kura Clover, Oat, Orchardgrass, Red Clover, Soybean, Spring Wheat, Winter Wheat and Wildrice

Minnesota Agricultural Experiment Station

UNIVERSITY OF MINNESOTA

Driven to Discover℠

The Matt Moore Buckthorn Plots

PLANT PATHOLOGIST MATT MOORE HAD A GOOD IDEA back around 1950. He proposed planting a buckthorn nursery – hedges of buckthorn, the alternative host for crown rust – in St. Paul campus test plots. Moore theorized that oat breeding plots planted nearby would be exposed to just about all the crown rust virulence in the world, invaluable in ongoing development of varieties with durable resistance to current and anticipated crown rust races.

Moore met a firestorm of vociferous opposition, much from high sources, fed by fears that the plots would endanger Minnesota oat production. Moore persisted, finally prevailed, and established the plots in 1953.

Moore's buckthorn hedges separating multiple rows of oat plants enable maximum sexual recombination of the fungus, resulting in new pathogenic races or "varieties" of oat crown rust races. Oat breeders and plant pathologists from other states and countries began, and continue, to send selections representing potential varieties for evaluation in these plots. They have enabled development of many new oat varieties with resistance to multiple (both existing and potential) races of crown rust.

One of these varieties with solid generalized resistance to more than 54 races of crown rust was released by the Minnesota Agricultural Experiment Station in 1979. It was named Moore to honor Matt's significant contributions to developing crown rust resistance in oats.

An avid naturalist and a dedicated teacher, Matt Moore was a professor in the Department of Plant Pathology from 1932 until 1973, and principal instructor for introductory plant pathology courses from 1942 until his retirement in 1973. Until ill health stopped him prior to his death in 1985, he spent countless hours in his buckthorn nursery, observing the crown rust reactions of test plants throughout each growing season.

In a ceremony on July 2, 2008, during the International Oat Conference hosted by the University, 55 years from their inception, Moore's plots officially were named the *Matt Moore Buckthorn Plots* to commemorate the visionary, dedicated scientist who persisted to establish them.

Oat researchers from around the world attended the dedication of the Matt Moore Buckthorn Plots and explored nearby test plots during dedication, July 2, 2008. Plant scientists worldwide use the plots.

UNIVERSITY OF MINNESOTA

Twin Cities Campus *Agricultural Experiment Station*

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Beverly R. Durgan

Dear Minnesota Growers,

The world sent a strong message to Minnesota farmers in 2008. That message was that increased bushels are needed to feed the growing demand for food and fuel.

The bankers and accountants also sent a strong message to farmers in 2008: that you need more bushels to pay for the rising cost of fertilizer, fuel and other inputs.

This publication is all about bushels. Our goal is to give you the information you need to make decisions that will be right for your farm. The varietal trials results in this booklet are part of a larger program focused on finding the best crop varieties that thrive in Minnesota, help build our economy and contribute to our quality of life.

The University of Minnesota plant breeding and genetics program has three goals:

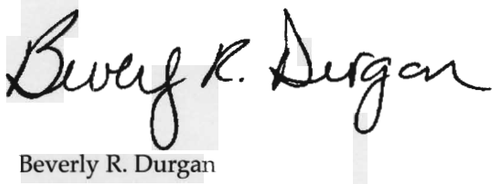
- Discovering new knowledge about plant breeding and plant genetics;
- Educating graduate and undergraduate students; and
- Developing plant germplasm, genetic stocks and varieties.

Minnesota Agricultural Experiment Station plant variety programs have a long history of helping farmers raise more bushels. The first agronomic crop varieties released by the University of Minnesota were hard red spring wheat varieties released in the 1890s. Almost as long is the history of University of Minnesota Extension. In 2009, Extension will celebrate its 100th anniversary of connecting community needs and University resources to improve the lives of Minnesotans. The history of Extension in Minnesota is as fascinating and diverse as the citizens who have helped

shape it, from the grasshopper plague of the '30s to the battle of the soybean aphid today, from 4-H youth conservation programs of the '20s to today's 4-H projects focused on science, engineering and technology.

A legacy of teamwork and partnerships stands out as I look back over the 100 years. History has many examples of farmers, farm organizations, the University of Minnesota, and state and federal agencies working to improve Minnesota agriculture. Those partnerships produced answers for many of the challenges Minnesota agriculture faced in the past and will face again in the future.

The University of Minnesota is committed to providing the answers growers need when making decisions today, and the long-term research to deal with the challenges that will come in the future.



Beverly R. Durgan
Dean, University of Minnesota Extension
Director, Minnesota Agricultural Experiment Station

CONTENTS

Minnesota
VARIETAL TRIALS RESULTS

To help growers select varieties best adapted to a specific area, the Minnesota Agricultural Experiment Station (MAES) compares varieties in trial plots at St. Paul, Becker, Crookston, Grand Rapids, Lamberton, Morris and Waseca, and in farmers' fields. Crop varieties are grown in replicated plots at each location, and factors affecting their yield and characteristics are as nearly the same as possible for all varieties at each location.

Not all crop varieties included in previous editions of Minnesota Varietal Trials are included in this 2009 edition. If you have a question about such a crop, contact the author(s) of the related crop section at 612-625-2740 or go to the MAES web site at www.maes.umn.edu. Click on Commodity / Crop Lines, then on Varietal Trials, which will display a crop listing.

Certified Seed

Use of certified seed is suggested, but certification in itself does not imply recommendation. Registered and certified seed of most varieties described in this report can be purchased from seed dealers or grower-members of the Minnesota Crop Improvement Association (MCIA). You can find sources of certified and registered seed at the MCIA web site, www.mcia.org.

Interpreting the Tables

The LSD (least significant difference) numbers beneath yield columns in tables are statistical measures of variability within trials, The LSD is used to determine whether the difference between two yields is due to a genetic difference in the varieties or to other causes, such as environmental variability.

If the yield difference between two varieties equals or exceeds the LSD value for the yield column, the higher-yielding variety probably was superior in yield. If the difference is less than the LSD the yield difference probably was due to environmental factors. An "NS" notation in a column indicates no significant difference for that characteristic. The relative maturities of varieties are variously indicated in the tables as date of maturity; date of heading or blooming; days to maturity, heading or blooming; or moisture percentage at harvest.

These varietal trials are not designed for crop (species) comparisons; crops are grown on different fields and with different management. The data should be used only to compare varieties within a table.

Abbreviations

To save space in variety descriptions and some other listings, "agricultural experiment station" often is abbreviated as AES.

Cooperating Researchers

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Varietal Trials Results

January 2009

Alfalfa

Craig Sheaffer, Joshua Larson and Douglas Swanson

Yield is the single largest determinant of return per acre for alfalfa production. Selecting alfalfa varieties with high yield potential is fundamental to obtaining high yields. The yield advantage realized with good alfalfa varieties quickly trivializes their greater seed cost.

Yield potential of alfalfa varieties is evaluated in trial plots at University of Minnesota Research and Outreach Centers and on cooperating farmers' fields. Trials are conducted using recommended fertility and pest control practices to optimize alfalfa yield and persistence.

Yield performance of tested varieties is presented as a percentage of check variety yields (average for Vernal, Oneida VR and 5312). Test locations are representative of the variable winter injury risk in different regions of Minnesota. Test locations include Rosemount (Dakota Co.), Zumbro Falls (Wabasha Co.), Lamberton (Redwood Co.), St. Martin and Richmond (Stearns Co.), Underwood (Otter Tail Co.) and Grand Rapids (Itasca Co.). In addition, some alfalfa varieties are tested for forage quality at Rosemount.

Locations of alfalfa trials.

Yield results for alfalfa varieties tested in current Minnesota yield trials (2005 to 2008 seeding years) are listed in Tables 1 through 4. Varieties in current forage quality and potato leafhopper trials are listed in Tables 5 and 6. Alfalfa variety seed marketers and matching web sites are provided in Table 7. Disease resistance information for alfalfa varieties is available on the web at www.alfalfa.org.

Winterhardiness

Severe winters make winterhardiness a primary consideration in variety selection for most areas of Minnesota. Winterhardiness of varieties is difficult to determine because winter injury can occur as a result of many different weather events that cause varied responses in alfalfa plants of differing ages.

The best indicator of winter survival potential is the yield performance in the third production year after seeding. Fall dormancy rating used to be a good indicator of winter survival potential, but this is no longer the case with modern varieties.

When selecting alfalfa varieties for your farm, greatest winterhardiness is needed in west central and northwestern Minnesota (see winter injury potential map). East central and southeastern Minnesota also frequently experience severe winters. Southwestern Minnesota seldom experiences severe winter injury because of dry soils, high soil potassium levels and neutral soil pH. Because of dependable snow cover, northeastern Minnesota seldom experiences severe winter injury.

Forage Yield

Yield results for alfalfa varieties tested in current Minnesota trials are presented in Tables 1 to 4. Yields are expressed as a percentage of check variety yields; for example, 113 means the variety had 13% greater yield than the average of the check varieties. Within each table, varieties are ranked according to their average performance across ALL current trials in which they have been tested (2005 to 2007 seedings). Individual tables correspond to test results from different regions of Minnesota.

Greatest confidence should be placed in variety yield information that represents more than five site-years of testing (e.g. two years of yield data at each of three test sites). Each variety in the yield result tables has been formatted to reveal how many site-years of Minnesota yield data have been collected. Varieties appearing in **bold** type have been tested in six or more site-years.

Varietal differences in yield tend to increase with stand age. Thus, to choose a variety for short-term stands, consider especially yield performance the first and second years after seeding (e.g. yield performance in 2006 and 2007 for a 2005 seeding). For long-term stands, choose varieties based on their performance through the third year after seeding (e.g. 2007 yield for 2004 seeding).

Forage Quality

While maturity is the greatest determinant of forage quality or feeding value of alfalfa, varieties also differ genetically in forage quality potential. Forage quality of alfalfa varieties in tests seeded in 2007 (four harvests) and 2008 (two harvests) in Minnesota are shown in Table 5a and 5b, respectively. Production year evaluation (first year after seeding) was done by analyzing each of three cuttings taken at late bud to one-tenth-bloom stages of maturity. Data are expressed as milk per ton of forage, milk per acre and relative forage quality (RFQ).

Milk per ton is calculated based on MILK2000 and combines crude protein, neutral detergent fiber (NDF) and NDF digestibility to predict milk production per ton of forage DM. In MILK2006, the intake of energy from forage for a 1,350-pound milking cow consuming a 30% NDF diet is calculated and the cow's maintenance energy requirement is then subtracted from energy intake to provide an estimate of energy available from forage for conversion to milk. Forage DM yield multiplied by milk per ton of forage DM provides an estimate of milk produced per acre and combines yield and quality into a single term. For a technical discussion of NDFD and Milk2006 see www.uwex.edu/ces/forage/articles.htm#milk2000.

Relative forage quality (RFQ) is an index with similar average and range as RFV but it includes NDF digestibility in estimates of DMI and TDN to calculate RFQ. For a technical discussion of RFQ, see: www.uwex.edu/ces/crops/uwforage/RFQvsRFV.htm.

Potato Leafhopper Tolerance

Potato leafhoppers (PLH) are usually the most damaging insect pest of alfalfa in Minnesota. Some alfalfa varieties have tolerance via inhibited PLH population growth and higher economic thresholds. Alfalfa varieties with greater than 50% resistance to PLH have an economic threshold three times higher than conventional varieties.

Despite their potential for significant damage, PLH are not a problem in every harvest, year and region of Minnesota. PLH pressure is more consistent south and east of Minnesota. A regional PLH-tolerant alfalfa yield trial was established in collaboration with the University of Wisconsin and Iowa State and Ohio State Universities. Tests were seeded in Iowa and Ohio, which are areas of more consistent PLH pressure. The results are presented in Table 6. The PLH Yield Index is based on harvests where PLH numbers exceed economic thresholds for nonresistant varieties.

Disease Resistance

Alfalfa root and crown diseases occur in most Minnesota soils. The most important diseases are Bacterial wilt, Phytophthora root rot, Fusarium wilt, Anthracnose, Verticillium wilt and Aphanomyces root rot (races 1 and 2). Plant resistance for all six diseases is widely available, except for Aphanomyces race 2 for which only a few, but a growing number of, varieties have known resistance. Variety resistance ratings for each disease are available on the web at www.alfalfa.org. Varietal resistance to potato leafhopper and grazing are also available; see www.alfalfa.org.

Brown root rot is known to be present in Minnesota soils, but varietal resistance is currently unknown.

While moderate resistance (MR) to a disease will provide protection to a variety under most conditions, either resistance (R) or high resistance (HR) is required for protection under severe disease conditions.

Winter injury can be the result of a combination of injury from cold temperatures and from root and crown diseases. Under some conditions, disease resistances can compensate for lesser levels of cold tolerance. While all varieties can benefit from improved disease resistance, it is especially important that varieties with less than Very Good (2) WSI have at least (R) levels of disease resistance to stay productive for more than two years after the seeding year under intensive management (4 cuts/season) in the east central and southeastern areas of Minnesota.

Blends

Many companies sell blends, a mixture of two or more varieties, at a reduced price from named varieties. Blends may perform as well as the best varieties or may do very poorly. Disease resistance, yield, winter survival and other characteristics may change within a blend from lot to lot or year to year as blend composition changes. Using *certified* seed best assures trueness to name.

For the web version of this report, go to the Minnesota Agricultural Experiment Station website URL www.maes.umn.edu/pubs.html

More detailed alfalfa variety performance results are on the UM-Agronomy FORAGES website: www.extension.umn.edu/forages/

Test Plot Research

Test plot establishment and management were supervised by Doug Swanson and Joshua Larson together with Russ Mathison, Steve Quiring and Doug Holen.

Alfalfa Planting Rate and Date

Bushel Weight, Pounds	60
Seeds/Pound	220,000
Planting Rate, Pounds/Acre	
Alone	13
With Grass	5-10
Planting Rate, Seeds/Sq.Ft.	
Alone	65
With Grass	25-50
Planting Date	Late April–Early May or Late July-Early August

Table 1. Alfalfa variety yield as percentage of check varieties at Rosemount (Dakota County), Zumbro Falls (Wabasha County) and Lamberton (Redwood County).

		Rosemount				Zumbro Falls			Lamberton
		2006 seeding			2007 seeding	2006 seeding			2007 seeding
Variety[1]	Marketer	2008	2007	2-Year Total	1-Year Total	2008	2007	2-Year Total	1-Year Total
L447HD	Legacy	—	—	—	—	118	112	115	—
GH727	Golden Harv.	—	—	—	—	116	108	111	—
FOREMOST II	Prairie	—	—	—	112	—	—	—	—
GENOA	NK Brand	112	109	111	—	119	108	113	—
MAGNUM VI	DairyLand	110	113	111	—	115	107	110	—
FSG 406	Allied	—	—	—	108	—	—	—	—
AMERISTAND 407TQ	Am. Alf.	—	—	—	109	113	106	109	—
PERFORM	DairyLand	111	106	108	—	109	105	107	—
MARINER III	Allied	104	110	107	—	—	—	—	—
6415	Garst	103	98	100	—	119	108	113	96
SPRINGGOLD	Renk	—	—	—	108	—	—	—	96
6417	Garst	—	—	—	106	—	—	—	108
54V46	Pioneer	107	102	105	—	124	106	114	—
WL 343HQ	W-L	117	98	108	—	111	101	105	—
DKA41-18RR	Dekalb	99	102	101	—	116	106	111	—
6443 RR	Garst	108	102	105	—	119	104	111	—
PHABULOUS III	Trelay Inc.	—	—	—	111	115	105	110	—
4A421	Mycogen	—	—	—	—	106	103	104	—
DKA34-17RR	Dekalb	108	103	105	—	—	—	—	—
4G418RR	Mycogen	—	—	—	—	108	101	104	—
55V48	Pioneer	—	—	—	110	—	—	—	99
53Q30	Pioneer	109	107	108	—	107	105	106	—
6426	Garst	—	—	—	106	—	—	—	95
5312	Check	109	107	108	105	109	105	107	106
VERNAL	Check	96	99	97	100	100	98	99	109
ONEIDA VR	Check	95	94	95	94	91	97	94	85
Checks, tons/acre as hay		*6.8*	*6.7*	*13.5*	*6.1*	*4.5*	*5.7*	*10.2*	*6.1*
LSD (5%)		16	11	12	9	15	8	9	13

[1] Total year average overall in current Minnesota trials. Bold varieties have been in Minnesota trials for more than 5 site-years.

Table 2. Alfalfa variety yield as percentage of check varieties at Grand Rapids (Itasca County).

		Grand Rapids				
		2005 seeding				2007 seeding
Variety[1]	Marketer	2008	2007	2006	3-Year Total	1-Year Total
AMERISTAND 407TQ	Am. Alf.	—	—	—	—	96
6417	Garst	—	—	—	—	98
54V46	Pioneer	100	84	103	97	—
4A421	Mycogen	104	100	113	107	—
LEGENDAIRY 5.0	CropLan	100	86	94	94	—
55V48	Pioneer	—	—	—	—	96
53Q30	Pioneer	99	89	98	96	—
6200 HT	Garst	106	107	100	104	—
6400 HT	Garst	98	97	101	99	—
5312	Check	106	110	110	109	101
VERNAL	Check	98	101	95	97	100
ONEIDA VR	Check	96	89	95	94	99
Checks, tons/acre as hay		*7.2*	*4.8*	*7.4*	*19.5*	*5.5*
LSD (5%)		8	22	12	8	7

[1] Total year average overall in current Minnesota trials. Bold varieties have been in Minnesota trials for more than 5 site-years.

Table 3. Alfalfa variety yield as percentage of check varieties at St. Martin and Richmond (Stearns County) and Underwood (Otter Tail County).

		Stearns County					Otter Tail County		
		St. Martin				Richmond	Underwood		
		2005 Seeding				2007 Seeding	2006 Seeding		
Variety[1]	Marketer	2008	2007	2006	3-Year Total	1-Year Total	2008	2007	2-Year Total
4S419	Mycogen	120	115	112	116	—	—	—	—
SOMERSET	NK Brand	121	115	108	115	—	—	—	—
DKA33-16	Dekalb	120	114	109	115	—	—	—	—
LABRADOR	Dahlco	115	114	114	114	—	—	—	—
L333HD	Legacy	—	—	—	—	113	—	—	—
WL 357HQ	W-L	116	112	108	112	—	—	—	—
GENOA	NK Brand	119	113	112	115	—	104	104	104
SUMMERGOLD	Renk	—	—	—	—	111	—	—	—
6420	Garst	110	110	111	110	—	—	—	—
MAGNUM VI	DairyLand	—	—	—	—	—	110	107	109
AMERISTAND 407TQ	Am. Alf.	—	—	—	—	110	116	109	112
4R429	Mycogen	112	104	109	108	—	—	—	—
PERFORM	DairyLand	—	—	—	—	—	112	105	108
8630	Mallard	107	109	108	108	—	—	—	—
6415	Garst	117	117	113	116	—	103	98	100
SPRINGGOLD	Renk	—	—	—	—	116	—	—	—
6417	Garst	—	—	—	—	114	—	—	—
54V46	Pioneer	112	110	114	112	—	110	104	107
WL 343HQ	W-L	—	—	—	—	111	104	100	102
6443 RR	Garst	—	—	—	—	—	101	98	100
PHABULOUS III	Trelay Inc.	—	—	—	—	106	99	95	97
LEGENDAIRY 5.0	CropLan	125	115	109	116	—	—	—	—
55V48	Pioneer	—	—	—	—	109	—	—	—
53Q30	Pioneer	108	112	107	109	—	89	95	92
6200 HT	Garst	103	101	103	102	—	95	99	97
6400 HT	Garst	102	98	103	101	109	99	102	100
5312	Check	103	108	106	106	105	104	106	105
VERNAL	Check	101	96	97	98	100	99	99	99
ONEIDA VR	Check	95	95	97	96	95	97	96	96
Checks, tons/acre as hay		*5.8*	*6.7*	*6.8*	*19.3*	*7.9*	*5.2*	*6.0*	*11.3*
LSD (5%)		6	8	8	9	10	14	11	11

[1] Total year average overall in current Minnesota trials. Bold varieties have been in Minnesota trials for more than 5 site-years.

Table 4. Seeding year alfalfa variety yields as a percentage of check varieties at Rosemount (Dakota County) and Underwood (Otter Tail County).

		Rosemount 2008 seeding	Underwood 2008 seeding
Variety[1]	Marketer	Seed Yr Total	Seed Yr Total
420 PLUS	Mustang	—	105
6431	Garst	106	102
PGI 459	Producer	—	104
LEGEND EXTRA	Legend	103	—
WL 357HQ	W-L	—	102
LIGHTNING IV	Jung	92	108
AMERISTAND 407TQ	Am. Alf.	99	—
VELOCITY	NuTech	100	98
6415	Garst	96	—
55V48	Pioneer	99	91
6417	Garst	92	97
DKA43-13	Dekalb	96	91
WL 343HQ	W-L	—	85
5312	Check	103	103
ONEIDA VR	Check	95	103
VERNAL	Check	102	94
Checks, tons/acre as hay		*2.9*	*1.3*
LSD (5%)		17	21

[1] Total year average overall in current seeding year Minnesota trials. Bold varieties have been in Minnesota trials for more than 5 site-years.

Table 5a. Alfalfa variety dry matter yield, milk production (expressed as percent of Vernal), RFQ index, CP and NDF (% dry matter), and NDFD (% NDF); 2008 season totals and weighted averages from a trial seeded in 2007 at Rosemount.

Variety, listed in descending order of milk production	DM yield [1] Ton/ acre	Milk, (% of Vernal) [2] Lb/ acre	Lb/ ton	RFQ[3], index	CP[3], % dm	NDF[3], % dm	NDFD[4], % NDF
SPRINGGOLD	5.7	110	101	203	24.2	33.7	51.2
Experimental 1 [5]	5.8	110	100	205	24.9	33.2	51.3
Experimental 2 [5]	5.7	108	100	206	24.9	33.2	51.6
6417	5.6	106	100	202	24.5	33.5	50.7
WL 322 HQ	5.5	104	100	204	25.1	33.2	51.1
CIMARRON	5.5	101	96	184	24.1	35.7	50.1
VERNAL	5.3	100	100	201	24.6	34.0	51.9
Vernal, actual values	5.3	17,200	3,270	201	24.6	34.0	51.9
Mean	5.6	106	100	201	24.6	33.8	51.1
LSD (5%)	ns	6	2	11	0.5	1.3	0.9
CV (%)	5.1	4.4	1.5	3.9	1.5	2.7	1.2

[1] A seasonal 4-harvest total taken on 28 May, 30 June, 30 July and 5 September 2008.

[2] Milk production (pounds milk per acre and ton) are predicted using the MILK2006 spreadsheet, version milk2006alfalfagrass, developed at the University of Wisconsin.

[3] RFQ=relative forage quality index; CP=% crude protein; and NDF=% neutral detergent fiber. Variables expressed as average concentration for the season.

[4] NDFD=neutral detergent fiber digestibility, expressed as % NDF concentration.

[5] Entered as experimental germplasm by alfalfa breeder.

Table 5b. Alfalfa variety dry matter yield, milk production (expressed as percent of Vernal), RFQ index, CP and NDF (% dry matter), and NDFD (% NDF); 2008 season totals and weighted averages from a trial seeded in 2008 at Rosemount.

Variety, listed in descending order of milk production	DM yield [1] Ton/ acre	Milk, (% of Vernal) [2] Lb/ acre	Lb/ ton	RFQ[3], index	CP[3], % dm	NDF[3], % dm	NDFD[4], % NDF
6431	2.7	107	102	204	21.9	33.6	49.1
VELOCITY	2.6	103	104	214	22.0	32.7	50.3
VERNAL	2.6	100	100	192	21.6	34.8	48.4
DKA 43-13	2.4	99	105	217	22.2	32.2	50.2
6415	2.4	99	105	222	22.5	31.7	50.7
CIMARRON	2.5	97	100	193	21.6	34.7	48.0
WL 322 HQ	2.4	96	105	218	23.2	31.7	49.9
6417	2.3	96	107	226	22.3	31.2	51.1
Vernal, actual values	2.6	8,400	3,240	192	21.6	34.8	48.4
Mean	2.5	100	104	211	22.2	32.8	49.7
LSD (5%)	ns	3	ns	15	0.6	1.8	1.9
CV (%)	7.3	2.1	6.7	4.9	2.1	3.8	2.6

[1] A seasonal 2-harvest total taken on 10 July and 22 August in 2008.

[2] Milk production (pounds milk per acre and ton) are predicted using the MILK2006 spreadsheet, version milk2006alfalfagrass, developed at the University of Wisconsin.

[3] RFQ=relative forage quality index; CP=% crude protein; and NDF=% neutral detergent fiber. Variables expressed as average concentration for the season.

[4] NDFD=neutral detergent fiber digestibility, expressed as % NDF concentration.

[5] Entered as experimental germplasm by alfalfa breeder.

Table 6. Alfalfa yield trial for potato leafhopper resistant varieties from a trial seeded in 2008 at South Charleston, Ohio.

Variety, listed in descending order of resistance	7/2/08	8/11/08	9/8/08	Total 2008	% of Susceptible Check[1]	Injury[2] 8/11/08	Marketer
53H92	0.27	0.64	0.32	1.21	135*	2.0	Pioneer
EverGreen 3	0.14	0.59	0.27	0.98	109*	2.5	NK Brand Seeds
6426	0.10	0.57	0.29	0.97	108*	2.3	Garst
AmeriStand 404LH	0.03	0.63	0.26	0.87	97	1.8	America's Alfalfa
Susceptible checks**	0.11	0.52	0.25	0.90	—	4.5	

Yield is expressed as tons dry matter/acre

* Varieties not significantly different from highest value in column.

** Susceptible check varieties were Vernal, DK 140 and 5454

[1] The % yield improvement over the yield of susceptible check varieties.

[2] Potato leafhopper injury rated from 1 = no visible injury to 5 = most severe injury.

Table 7. 2008 forage seed sources

Marketer	Company	Web URL
Albert Lea	Albert Lea Seed House	www.alseed.com
Allied	Allied Seed	www.alliedseed.com
Am. Alf.	America's Alfalfa	www.americasalfalfa.com
Barenburg	Barenburg Midwest	www.barusa.com
Croplan	CROPLAN Genetics	www.croplangenetics.com
Dahlco	Dahlco Seed	www.dahlco.com
Dairyland	Dairyland Seed Co.	www.dairylandseed.com
Dekalb	AsgrowDeKalb	www.asgrowanddekalb.com
FFR	FFR Cooperative	www.ffrcoop.org
Garst	Garst Seed Co.	www.garstseed.com
Golden Harv.	JC Robinson Seeds/Golden Harvest	www.goldenharvestseeds.com
Jung	Jung Seed Genetics	www.jungseedgenetics.com
Legacy	Legacy Seeds, Inc.	www.legacyseeds.com
Legend	Legend Seeds	www.legendseeds.com
LG Seeds	LG Seeds	www.lgseeds.com
Mallard	Mallard Seed	www.mallardseed.com
Mustang	Mustang Seeds	www.mustangseeds.com
Mycogen	Mycogen Seeds	www.mycogen.com
NC+	NC+ Hybrids	www.nc-plus.com
NK Brand	NK Brand	www.nk-us.com
NuTech	NuTech Seed	www.nutechseed.com
Pioneer	Pioneer Hi-Bred International Inc.	www.pioneer.com
Prairie	Prairie Brand	www.prairiebrandseed.com
Producer	Producer's Choice	www.producerschoiceseed.com
Renk	Renk Seed Co.	www.renkseed.com
Trelay Inc.	Trelay Inc.	www.trelay.com
W-L	W-L Research, Inc.	www.wlresearch.com
Ziller	Ziller Seed Co. Inc.	www.zillerseed.com
U of MN	University of Minnesota Forages	www.extension.umn.edu/forages

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Varietal Trials Results

January 2009

Birdsfoot Trefoil

Nancy Ehlke and Donn Vellekson

Birdsfoot trefoil is an excellent non-bloating pasture legume that can also be harvested for hay and silage. It grows under a wide range of soil conditions, and persists longer and performs better than other legumes under poor soil conditions such as low fertility, acidity and poor drainage. It is also persistent when grown with Kentucky bluegrass, reed canarygrass and timothy.

Performance trials of birdsfoot trefoil were established at Rosemount in 1997, 1998, 2001 and 2003, and at Grand Rapids in 1998, 2001 and 2006. The trials are generally harvested twice at Grand Rapids and two or three times at Rosemount.

Winterhardiness is very important and only adapted varieties should be planted. The variety Norcen was released jointly in 1983 by the agriculture experiment stations of Minnesota and six other north central states; it has been a standard ever since. It is winterhardy and has performed well in grazing trials.

Consult forage management specialists for other varieties that may be appropriate for your area.

Birdsfoot Trefoil Planting Rate and Date

Bushel Weight, Pounds.....60

Seeds/Pound.....372,000

Planting Rate, Pounds/Acre
- Alone.....8
- In Mixtures.....6

Planting Rate, Seeds/Sq.Ft.
- Alone.....70
- In Mixtures.....50

Planting Date...Early Spring or Summer

Dry matter yield, in tons dry matter per acre, of birdsfoot trefoil varieties seeded at 2 locations.

	Winter Injury,*	Rosemount				Grand Rapids		
Variety	5/24/2004	1998	1999-01	2002	2004-06	1999-01	2002-04	2007-08
Bright	—	3.6	3.1	—	—	—	—	—
Dawn	1	4.0	3.8	4.0	4.4	4.8	2.1	3.5
Empire	—	4.0	—	—	—	4.4	—	3.4
Fergus	—	3.9	—	—	—	—	—	—
Georgia 1	—	—	3.6	—	—	4.6	1.8	—
Leo	—	3.9	3.1	—	—	—	—	—
Norcen	1	4.3	3.5	3.9	3.9	4.8	2.1	3.2
Nueltin	1	3.7	3.1	4.0	3.4	4.2	2.2	—
Pardee	8.3	—	—	3.5	0.1	—	1.9	3.5
Roseau	2.5	4.1	3.4	4.1	3.5	4.6	2.1	—
Steadfast	—	3.1	2.7	—	—	3.5	—	—
Trevig	—	4.1	—	4.2	—	—	—	—
Viking	1.8	3.8	3.6	4.0	4.1	4.4	2.1	—
Witt	—	4	3.2	4.1	—	—	2.0	3.7
LSD@5%	0.9	0.5	0.3	0.4	0.3	0.5	0.2	0.4

* Winter injury at Rosemount; 1 = no injury; 9 = dead.

Seed sources for alternate forage plots.

Deer Creek Seed	PO Box 105, Ashland, WI 54806	877-247-3736
Pickseed	Box 304, 1 Greenfield Rd., Lindsay, ON Canada K9V 4S3	800-268-2806
Norfarm Seed	31154 430th Ave., Roseau, MN 56751	218-463-2119
Etheridge Farm	1950 Lane 11, Powell, WY 82435	307-754-2371
Allied Seed	9311 Highway 45 Lane, Nampa, ID 83686	888-252-7573
Brett Young LTD	PO Box 99, St. Norbert PS, Winnipeg, MB Canada R3V 1L5	800-665-5015
Wrightson LTD	PO Box 50240, Porirua, New Zealand	64 4 49183335
Agri Pro	PO Box 30, Berthoud, CO 80513	877-943-2827
Cascade Seed	1406 E. Front Ave., Spokane, WA 99220	509-534-9431
Twin City Seed	7265 Washington Ave. S., Edina, 55439	952-944-7105
General Feed and Grain	7128 3rd St., Bonner Ferrys, ID 83805	208-267-3185
Geertson Seed	P.O. Box 205, Greenleaf, ID 83626	800-843-0390
Lethbridge Research Centre	PO Box 3000, Lethbridge, AB Canada T1J4B1	403-327-4561
Northern Excellence	PO. Box 186, Williams, MN 56686	218-783-2214

Please note: No trials of bromegrass, cicer milkvetch, reed canarygrass, tall fescue or timothy were conducted in 2008. The most recent information on these crops is available on the web at www.maes.umn.edu At this site click on Commodity/Crop Links, then on Varietal Trials, which will display a crops listing.

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Varietal Trials Results

January 2009

Kura Clover

Nancy Ehlke and Donn Vellekson

Kura clover is a relatively low growing, spreading perennial legume. It is best used as a grazing crop because of its growth habit and high moisture content. Kura clover can tolerate frequent grazing and has consistently high forage quality, resulting in high animal performance. Kura clover can induce bloat in grazing ruminants and may be best suited for planting in mixtures with cool-season grasses, such as reed canarygrass and orchardgrass.

Kura clover is persistent once established but has poor seedling vigor, slightly less than birdsfoot trefoil. As with other legumes, kura clover requires inoculation with the proper rhizobium to insure atmospheric nitrogen fixation. Because of its excellent persistence and spreading growth habit, kura clover has great potential for soil cover and erosion control in agricultural and nonagricultural areas.

Summary tables include variety trials seeded in 1999, 2002 and 2005 at Rosemount and in 2002 and 2006 at Grand Rapids. Nitrogen was applied at the rate of 30 pounds per acre at the time of seeding to assist early growth. Trials were harvested three times per year at Rosemount and twice per year at Grand Rapids.

Kura Clover Planting Rate and Date

Bushel Weight, Pounds.....60
Seeds/Pound..... 215,000
Planting Rate, Pounds/Acre
Alone.....10
In Mixtures.....6
Planting Rate, Seeds/Sq. Ft.
Alone.....50
In Mixtures.....30
Planting Date..... Early Spring or Summer

Dry matter yield, in tons per acre, and vigor of kura clover varieties seeded at 2 locations.

	Vigor**	Rosemount			Grand Rapids	
Variety	5/1/2003	2001-02	2003-05	2006-07	2003-04	2007-08
Cossack	5.0*	4.0	4.0	3.5	1.1	3.6
Endura	3.3	4.3	4.8	3.2	1.2	4.0
NF-93	5.5	4.6	4.7	3.3	0.9	3.3
Rhizo	2.8	4.1	4.0	2.5	0.8	—
LSD@5%	1.0	0.5	0.5	0.8	0.1	0.4

* Yield adjusted due to alfalfa contamination in seedlot.
** Vigor at Rosemount; 1 = least, 9 = best vigor.

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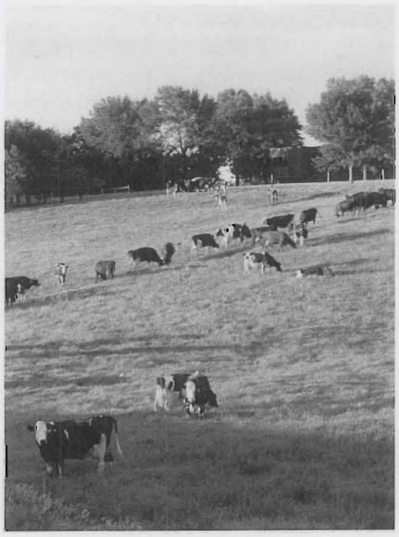
Varietal Trials Results

January 2009

Orchardgrass

Nancy Ehlke and Donn Vellekson



Orchardgrass often is used in hay and pasture mixes with other grasses and legumes because it establishes rapidly and recovers quickly after grazing or harvesting. Its major limitation is a lack of winter-hardiness, but in areas with reliable snow cover it can persist and remain productive for many years.

Maturity is another important consideration. Other grass and legume species in the mixture, seed availability and timing of needed grazing or cutting will help determine the best variety for a certain situation.

Orchardgrass varieties were established in pure stands in 2002 and 2005 at Rosemount, and in 1998, 2002 and 2006 at Grand Rapids.

Experimental plots were generally harvested three times per year at Rosemount and two or three times per year at Grand Rapids. Nitrogen was applied in the early spring and after each harvest at a rate of 50 pounds per acre for each application.

Orchardgrass Planting Rate and Date

Bushel Weight, Pounds	14
Seeds/Pound	653,000
Planting Rate, Pounds/Acre	
Alone	10
In Mixtures	3
Planting Rate, Seeds/Sq. Ft.	
Alone	150
In Mixtures	45
Planting Date	
Alone	Early Spring or Late Summer
In Mixtures	Use Date for Legume

Dry matter yield of orchardgrass, in tons dry matter per acre, of orchardgrass varieties seeded at two locations.

Variety	% Heading* 5/30/2006	Winter Injury** 5/16/2007	Rosemount 2003-05	Rosemount 2006-07	Rosemount 2007-08	Grand Rapids 1999-03	Grand Rapids 2004-05	Grand Rapids 2007-08
AC Nordic	—	—	—	—	—	3.7	—	—
Albert	3	4.8	—	3.7	3.1	3.9	—	3.7
Ambassador	—	—	—	—	—	3.6	—	—
Bengal	—	—	—	—	—	—	—	—
Condor	—	—	—	—	—	3.8	—	—
Duke	8	5.8	3.7	3.5	3.0	3.8	1.6	3.8
Elsie	—	—	—	—	—	3.5	—	—
Extend	—	—	3.6	—	—	—	1.6	—
Haymate	—	—	—	—	—	3.7	—	—
Hawkeye	—	—	3.8	—	—	3.9	1.6	—
Justus	16	7.5	3.4	3.5	3.1	3.4	1.5	3.2
Kayak	50	1.8	—	3.6	3.3	—	—	3.7
Megabite	—	—	3.8	—	—	3.7	1.7	—
Mammoth	—	—	—	—	—	—	—	—
Napier	3	5.8	—	3.6	3.3	—	—	3.5
Orion	—	—	3.5	—	—	4.1	1.4	—
Potomac	3	7.0	3.8	3.6	2.6	—	1.3	3.8
Warrior	6	7.8	3.4	4.0	2.9	—	1.5	3.4
LSD 5%	12	1.2	NS	NS	0.6	0.4	NS	0.5

*Percent heading at first harvest, higher percentage = earlier maturity.
** Winter injury, 1 = no injury, 9 = dead.

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Varietal Trials Results

January 2009

Red Clover

Nancy Ehlke and Donn Vellekson

Red clover can be seeded in pure stands or with grasses for grazing, hay or silage. It is more easily established in pasture renovation than either alfalfa or trefoil.

Historically, varieties of red clover have not persisted beyond two crop years in Minnesota because they are susceptible to diseases and winterkill. However, most of the improved varieties currently sold for use in Minnesota can persist for three years if there is good winter snow cover.

Experimental varietal trial plots were established at Grand Rapids in 1999, 2002 and 2006, and at Rosemount in 1999, 2002, 2005 and 2006. Harvest frequency generally is three times per year.

Winter injury at Rosemount was quite severe in 2003-04 and 2007-08. Varietal differences were observed in 2004. Ratings in the summary table may give some indication as to winterhardiness in the second or third production year.

A benefit of red clover is its resistance to potato leafhopper injury. Nonetheless, a severe infestation at Rosemount in 2003 injured some varieties. Scarlett and Marathon had very little injury while Freedom and Arlington had severe chlorosis from the feeding insects.

Red Clover Planting Rate and Date

Bushel Weight, Pounds	60
Seeds/Pound	272,000
Planting Rate, Pounds/Acre	
Alone	9
In Mixtures	5
Planting Rate, Seeds/Sq. Ft.	
Alone	55
In Mixtures	30
Planting Date	
Alone	Early Spring to September 1

Tons per acre dry matter, leafhopper injury and winter injury on red clover varieties seeded at 2 locations.

	Potato* Leafhopper Injury	Winter Injury**	Rosemount				Grand Rapids		
Variety	7/14/2003	5/24/2004	2000	2003	2006-07	2007	2000-01	2003-04	2007-08
Arlington	3.5	6.5	5.2	3.6	4.3	3.7	3.0	1.2	2.6
Cinnamon plus	2.3	7.5	—	4.2	4.8	4.3	—	1.3	3.1
Freedom	4.8	8.5	5.5	3.7	—	—	3.2	1.2	—
Juliette	3	6.3	5.6	4.0	—	—	3.3	1.3	—
Marathon	1.5	5	5.6	4.3	4.4	4.2	3.2	1.4	2.9
Prima	—	—	5.3	—	—	—	3.5	—	—
Redlan Graze II	1.3	8	—	4.3	—	4.4	—	1.5	—
Redstar	—	—	5.9	—	—	—	3.4	—	—
Scarlett	1.3	5.3	—	4.0	4.7	4.3	—	1.4	3.4
LSD 5%	0.9	1.4	0.6	0.3	0.6	0.4	0.3	0.2	0.4

* Potato leafhopper injury at Rosemount; 1 = none, 5 = worst.

** Winter Injury; 1 = none, 9 = all dead.

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Varietal Trials Results

January 2009

Barley

Kevin Smith and Ed Schiefelbein

Barley varieties are compared in replicated trials in Crookston, Morris, St. Paul, Stephen and Roseau. Data collected from these trials should be used to make comparisons only among those varieties included in the trials. Descriptions of barley varieties are listed by year of release.

Variety Selection Criteria

Most barley producers in the region grow barley for malt and select varieties approved by the American Malting Barley Association (AMBA). The most important industry specifications for making malting grade are grain protein, kernel plumpness and deoxynivalenol (DON), the toxin produced by the Fusarium Head Blight (FHB) pathogen. Please consult the AMBA recommended varieties for the most current information about industry acceptance of malting barley varieties at www.ambainc.org.

For most producers the disease FHB and the presence of DON in harvested grain are the two most important factors limiting production of malting barley in the region. The two-rowed variety Conlon typically has slightly lower DON compared to the other varieties. There are no significant differences among the current six-rowed malting varieties for resistance to FHB.

General-Purpose Varieties

Rasmusson -- High yield and medium maturity. Good lodging resistance, slightly shorter plant height. Six-rowed, semi-smooth awns, short rachilla hairs, colorless aleurone. Currently being evaluated for classification by AMBA as a malting variety. Resistant to spot blotch. Developed from crosses involving Lacey. Released by Minn. AES in 2008. **PVP (pending)**

Stellar-ND -- Medium yielding and medium maturity. Good lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, long rachilla hairs, and colorless aleurone. Classified as a malting variety by AMBA. Resistant to spot blotch and slightly better net blotch resistance compared to Robust. Released by N.D. AES in 2005. **PVP (94)**

Tradition -- High yielding and medium maturity. Medium lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, long rachilla hairs and colorless aleurone. Classified as a malting variety

Relative grain yield (percent of the mean of the trial) of barley varieties showing single-year (2008) and multiple-year comparisons (2006-2008).

	Crookston		Morris	Stephen		St. Paul		Roseau		State Mean	
	2008	3-year	2-year[1]	2008	3-year	2008	3-year	2008	3-year	2008	3-year
Robust	96	97	93	94	91	90	98	92	99	93	96
Stander	95	100	99	100	94	99	100	97	105	98	100
Lacey	109	103	104	114	109	115	104	108	99	112	103
Rasmusson[2]	103	105	110	108	104	111	110	115	—	109	107
Drummond	100	100	95	102	99	103	107	88	96	98	100
Stellar ND	100	101	97	107	102	95	93	98	100	100	99
Legacy	104	101	108	109	109	99	105	95	99	102	104
Tradition	107	100	104	99	104	116	104	107	107	107	103
Conlon	86	91	90	67	88	71	79	101	94	81	88
LSD 0.05	18.4	8.1	11.1	9.9	8.9	19.2	8.6	14.8	8.5	7.9	4.0
Mean, Bu/Acre	123	110	82	118	102	109	101	135	100	121	101

[1] Only two years of data, 2006 and 2007.
[2] Only 1 year of Roseau data available.

by AMBA. Resistant to spot blotch, slightly better net blotch resistance compared to Robust. Developed by Busch-Agricultural Resources Inc. (BARI). Released 2003. **PVP (94)**

Drummond -- Medium yield and medium maturity. Very good lodging resistance and good kernel plumpness. Six-rowed, semi-smooth awns, long rachilla hairs, colorless aleurone. Classified as a malting variety by AMBA. Resistant to spot blotch and slightly better net blotch resistance compared to Robust. Developed from crosses involving Azure, Bumper, Hazen and Stander. Released by N.D. AES in 2000. **PVP (94)**

Legacy -- High yielding and medium-late maturity. Medium lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, long rachilla hairs and colorless aleurone. Classified as a malting variety by AMBA. Resistant to spot blotch, slightly better net blotch resistance compared to Robust. Developed by Busch-Agricultural Resources Inc. (BARI) from a complex cross involving the parental varieties Bumper, Karl, Manker and Excel. Released 2000. **PVP (94)**

Lacey -- High yield and medium maturity. Good lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, short rachilla hairs, colorless aleurone. Classified as a malting variety by AMBA. Resistant to spot blotch. Developed from crosses involving Robust, Excel and Stander. Released by Minn. AES in 2000. **PVP (94)**

Conlon -- Medium yielding and early maturity. Moderate lodging resistance and very plump kernels. Two-rowed , semi-smooth awns, long rachilla hairs, colorless aleurone. Classified as a malting variety by AMBA. Resistant to net blotch but moderately susceptible to spot blotch compared to Robust. Released by N.D. AES in 1996. **PVP (94)**

Robust--Low yield and medium maturity. Medium lodging resistance and good kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Classified as a malting variety by AMBA. Resistant to spot blotch. Developed from crosses involving Morex and Manker. Released by Minn. AES 1983.

Special-Purpose Varieties

Royal -- Intended for use as a forage companion crop and feed-grain variety. Not a malting variety. Six-rowed, semi-smooth awn, blue aleurone, semidwarf stature. Superior in forage quality (RFV) compared to taller varieties based on digestibility and intake potential; low in fiber and lignin. Similar to Robust in forage protein and forage yield at the soft dough stage. Compared to taller barley and oat varieties it competes less with underseeded forage legumes because of its short stature and superior lodging resistance. Resistant to spot blotch. Developed from crosses involving Robust, Azure and semidwarf Minn. M32. Released by Minn. AES 1994. **PVP (94)**

Stander--Medium yield and late maturity. Very good lodging resistance and good kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone and short stature. Not classified as a malting variety. Resistant to spot blotch. Developed by Minn. AES from crosses involving Excel, Robust and Bumper. Released 1993. **PVP**

Test Plot Research

Test plot establishment and management were supervised by John Wiersma and John Nelson.

Barley
Planting Rate and Date

Bushel Weight, Pounds	48
Seeds/Pound	14,300
Planting Rate, Pounds/Acre	85
Planting Rate, Seeds/Sq. Ft.	28
Planting Date	Early Spring

Agronomic characteristics of barley varieties, 2004-2008.

Variety	Type	Use	Heading (DAP)	Height (inches)	Lodging	Plump (%)	Protein (%)
Robust	6-row	Malt	58	34.5	med.	86	13.9
Stander	6-row	Feed	59	31.7	strong	85	13.5
Lacey	6-row	Malt	59	32.4	strong	87	14.1
Rasmusson[2]	6-row	Malt	58	30.9	strong	84	13.2
Drummond	6-row	Malt	58	32.3	v. strong	83	13.7
Stellar ND[1]	6-row	Malt	58	32.4	strong	86	13.1
Legacy	6-row	Malt	59	33.5	med.	82	13.4
Tradition	6-row	Malt	59	33.0	med.	86	13.3
Conlon	2-row	Malt	57	31.7	med.	93	13.5
No. of Trials			15	14	15	12	12

[1] Only three years of plump and protein data, 2005-2007.
[2] Only three years of plump and protein data, 2004-2006.

Disease reactions of barley varieties in multiple year comparisons[1].

Variety	Fusarium Head Blight	Net Blotch	Septoria Speckled Leaf Blotch	Spot Blotch	Stem Rust[2]
Robust	8	8	9	2	1
Stander	9	8	9	2	1
Lacey	8	8	9	2	1
Rasmusson	8	9	9	2	1
Drummond	8	7	9	2	1
Stellar ND	8	7	9	2	1
Legacy	7	5	9	2	1
Tradition	8	7	9	2	1
Conlon	7	5	9	3	1

[1] 1-9 scale where 1 = most resistant, 9 = most susceptible.
[2] Reaction to the dominant strain of the stem rust pathogen.

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Varietal Trials Results

January 2009

Corn Grain

Tom Hoverstad, Jeff Coulter, George Nelson, Steve Quiring and Mark Hanson

The Minnesota Corn Hybrid Evaluation Program is conducted by the University of Minnesota Agricultural Experiment Station to provide corn growers with unbiased information for choosing hybrids to buy and grow. The program is financed in part by entry fees from private seed companies that chose to enter their hybrids for testing.

Test Locations

Test zones, locations and maturities are:

Southern Zone:

Lamberton, Waseca and Rochester

Early Maturity Trial –103 Relative Maturity (RM) and earlier hybrids

Late Maturity Trial – 104 RM and later hybrids

Central Zone:

Morris and Rosemount

Early Maturity Trial – 96 RM and earlier hybrids

Late Maturity Trial – 97 RM and later hybrids

Northern Zone:

Staples, Rothsay and Crookston

Testing Procedure

Entries: Seed corn companies choose their entries for each zone. Entries in each trial were based on the relative maturity(RM) provided by the company. The University of Minnesota Corn Testing Committee could also choose and enter hybrids in each test. All locations tested three replications for each entry.

Data Presentation

Yields are given for individual locations along with yields and harvest moisture contents averaged across locations for 2008. Reported yields are adjusted to 15.5% grain moisture. Hybrids are ranked within a maturity group by moisture content averaged across locations for 2008.

Identification of Traits

Genetic modifications of hybrids are identified using generic terms to describe the trait without identifying the specific event for genetic modification.

For example, Bt will indentify genetic modification for corn borer resistance but will not differentiate between the Bt 11 event, the YieldGuard corn borer event or the Herculex corn borer event.

Identifiers will be:
Bt = European corn borer resistance
CRW = Corn rootworm resistance
GLY = glyphosate herbicide resistance
LL = Liberty herbicide resistance

Companies participating in the 2008 hybrid corn grain trials.

AgriGold Hybrids	www.agrigold.com
Crows Hybrid Corn Co.	www.crowshybrid.com
Dahlman Seed Co.	www.dahlmanseed.com
Dairyland Seed Co., Inc.	www.dairylandseed.com
Dekalb	www.dekalb.com, www.asgrow.com
Farm Advantage	www.farmadvantage.com
G2 Genetics	www.yieldleader.com
Gold Country Seed Inc.	www.goldcountryseed.com
Hyland Seeds	www.hylandseeds.com
Jung Seed Genetics Inc.	www.jungseedgenetics.com
Kaltenberg Seeds	www.kaltenbergseeds.com
Kruger Seed Co.	www.krugerseed.com
Legacy Seeds Inc.	www.legacyseeds.com
Midwest Seed Genetics	www.midwestseed.com
Mycogen Seeds	www.dowagro.com/mycogen
NuTech Seed	www.nutechseed.com
Peterson Farms Seed	www.petersonfarmsseed.com
Pioneer Hi-Bred International, Inc.	www.pioneer.com/usa/
Proseed Inc.	www.proseed.net
Renk Seed Co.	www.renkseed.com
Seeds 2000	www.seeds2000.net
Terming Seeds	www.termingseeds.com
Viking Hybrids (Albert Lea Seed House)	www.alseed.com
Wensman Seed Co.	www.wensmanseed.com

Least Significant Difference

The LSD (Least Significant Difference) figures at the bottom of the yield columns in the tables are statistical measures of variability in the trials. These values may be used to determine whether the difference between any two hybrids is likely to be a real difference or just natural variation.

If the yield difference between two hybrids is equal to or greater than the LSD, then one can be confident that the two hybrids probably differ in yield potential. We show LSD values with a 0.2 alpha level, which means that when two hybrids differ in yield by the LSD value or more, one can be 80% confident that the two hybrids differ in yield potential. The higher-yielding one is the better hybrid from the yield standpoint. If the yield difference between two hybrids is less than the LSD, the two hybrids probably do not differ significantly in yield potential.

Table 1. Individual trial information, 2008.

Location	Cooperators	Previous Crop	Planting Date	Harvest Dates
Lamberton	Steve Quiring	Soybean	15 May	29 October
Waseca	Tom Hoverstad	Soybean	2 May	27 October
Rochester	Fritz Brietenbach	Soybean	6 May	3 November
Morris	George Nelson	Soybean	15 May	29 October
Rosemount	Jerry Holz	Soybean	8 May	11 November
Staples	Bob Scheaffer	Corn	16 May	11 November
Rothsay	George Nelson, Troy Larson	Wheat	17 May	24 November
Crookston	Mark Hanson	Wheat	8 May	20 November

Corn Planting Rate and Date

Bushel Weight, Pounds.....56

Planting Rate, Seeds/Acre.....33,000

Planting Date..... April 15 – May 5

Early maturity hybrids, southern locations, 2008.

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Lamberton	Rochester	Waseca	Yield Across Locations Bu/Acre	% Moisture
97 and earlier RM hybrids								
Kruger	K-6093VT3	GLY Bt CRW	93	201	173	159	178	15.5
Viking	A71-96R	GLY	96	218	169	173	187	15.7
Renk	RK501YGCB	Bt	95	197	180	170	182	15.8
Kruger	K-6697VT3	GLY Bt CRW	97	190	178	140	170	15.9
Kruger	K-6097VT3	GLY Bt CRW	97	218	219	155	197	15.9
Anderson	756VT3	GLY Bt CRW	95	204	151	161	172	16.0
Dahlman	R48-07 VT3	GLY Bt CRW	95	215	191	175	194	16.2
Kruger	K-6094VT3	GLY Bt CRW	94	204	195	167	189	16.3
Gold Country	96-08 VT3	GLY Bt CRW	96	224	216	191	210	16.3
Kruger	K-1295RR	GLY	95	200	184	160	181	16.3
Midwest Seed Genetics	69575VT3	GLY Bt CRW	95	218	184	166	189	16.4
NuTech	1N-398 CB/LL/RW	LL Bt CRW	97	192	203	163	186	16.5
Gold Country	94-04 VT3	GLY Bt CRW	94	192	198	166	186	16.5
Anderson	756R	GLY	95	213	169	166	183	16.6
NuTech	3T-098A VT3	GLY Bt CRW	96	210	164	166	180	16.6
Dahlman	R48-25 VT3	GLY Bt CRW	95	196	167	167	177	16.7
Dekalb	DKC46-60	GLY Bt CRW	96	202	189	159	183	16.7
NuTech	3T-995 VT3	GLY Bt CRW	95	205	177	172	185	16.7
NuTech	3A-098 RR	GLY	96	210	185	182	193	16.8
Crows	1725VT3	GLY Bt CRW	95	209	218	162	196	16.8
Jung	7426 VT3	GLY Bt CRW	96	205	227	186	206	17.0
NuTech	3C-300 RR/YGCB	GLY Bt	97	210	183	179	191	17.0
G2 Genetics	5H-298 RR/HX	GLY LL Bt	97	206	215	178	200	17.0
Wensman	W 7267 VT3	GLY Bt CRW	97	212	170	202	195	17.2
NuTech	3T-096A VT3	GLY Bt CRW	95	192	162	155	170	17.4
NuTech	3T-098 VT3	GLY Bt CRW	95	204	169	170	181	17.5
NuTech	3P-400 RR/YGPL	GLY Bt CRW	97	209	146	163	173	17.9
NuTech	5H-599 RR/HX	GLY LL Bt	97	201	210	201	204	18.0
NuTech	5N-898 GT/CB/LL/RW	GLY LL Bt CRW	97	215	193	158	189	18.3
NuTech	3T-500 VT3	GLY Bt CRW	97	208	208	179	198	18.4
NuTech	5H-597 RR/HX	GLY LL Bt	96	251	214	160	208	19.0
97 and earlier RM averages:				**208**	**187**	**169**	**188**	**16.8**

Early maturity hybrids, southern locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at:			Yield Across Locations	
				Lamberton	Rochester	Waseca	Bu/Acre	% Moisture
98 to 101 RM hybrids								
Dekalb	DKC49-32	GLY Bt CRW	99	201	166	166	178	16.0
Dairyland	ST-9799	GLY Bt CRW	99	212	203	147	188	16.2
Kaltenberg	K4433VT3	GLY Bt CRW	100	207	183	148	179	16.2
Gold Country	100-07 VT3	GLY Bt CRW	100	215	206	167	196	16.2
Jung	7482 VT3	GLY Bt CRW	100	203	186	153	180	16.3
Jung	7454 VT3	GLY Bt CRW	98	210	178	174	187	16.4
Kruger	K-6298VT3	GLY Bt CRW	98	216	209	176	200	16.4
Kruger	K-1500RR	GLY	99	222	206	147	192	16.4
Kruger	K-6400TS	GLY Bt CRW	100	215	167	155	179	16.7
Kaltenberg	K4263VT3	GLY Bt CRW	98	189	179	142	170	16.9
Kruger	K-6499VT3	GLY Bt CRW	99	215	210	179	201	17.0
Dekalb	DKC48-37	GLY Bt CRW	98	197	190	182	189	17.0
Anderson	6043		98	214	179	176	190	17.1
AgriGold	A6225VT3	GLY Bt CRW	98	233	211	160	202	17.1
Gold Country	98-10 VT3	GLY Bt CRW	98	195	182	177	185	17.1
Wensman	W 7289 VT3	GLY Bt CRW	99	217	171	167	185	17.1
Midwest Seed Genetics	70006R	GLY	99	220	169	166	185	17.4
Viking	7809 VT3	GLY Bt CRW	98	212	172	168	184	17.4
Crows	1928R	GLY	99	216	187	164	189	17.5
Wensman	W 7273 VT3	GLY Bt CRW	98	188	198	179	188	17.5
Dekalb	DKC50-19	GLY Bt CRW	100	218	219	182	206	17.6
Pioneer	37Y14	GLY LL Bt CRW	99	196	185	150	177	17.6
Renk	RK616VT3	GLY Bt CRW	101	198	194	163	185	17.6
Farm Advantage	87A99GL	GLY LL Bt CRW	99	229	184	166	193	17.6
Renk	RK584CBLL	LL Bt	99	206	205	167	193	17.6
Viking	W86-00L	LL Bt	100	212	213	157	194	17.6
Viking	W66-98L	LL	98	234	213	173	206	17.7
Anderson	603R	GLY	98	196	192	168	185	17.8
Dahlman	R49-28 VT3	GLY Bt CRW	98	204	168	179	184	17.8
AgriGold	A6279VT3	GLY Bt CRW	101	232	170	183	195	18.1
Dekalb	DKC50-44	GLY Bt CRW	100	238	181	182	200	18.2
NuTech	3T-101+ VT3	GLY Bt CRW	101	206	162	147	172	18.4
Crows	2123VT3	GLY Bt CRW	101	203	196	183	194	18.5
G2 Genetics	5H-501 RR/HX	GLY LL Bt	101	222	183	170	192	18.7
G2 Genetics	5H-702 RR/HX	GLY LL Bt	101	219	209	208	212	19.0
NuTech	3T-500A VT3	GLY Bt CRW	100	216	205	181	201	19.0
Viking	60-01N		101	238	220	158	206	19.1
Jung	7475 VT3	GLY Bt CRW	100	236	216	189	213	19.2
Kruger	K-6401VT3	GLY Bt CRW	101	240	225	173	212	19.2
Kruger	K-3300RR/HX	GLY Bt	100	256	195	171	207	19.4
NuTech	1X-201 HXT/LL	LL Bt CRW	101	232	197	151	193	19.5
NuTech	5X-201+ HXT/RR	GLY LL Bt CRW	101	238	182	173	198	19.8
NuTech	3P-302 RR/YGPL	GLY Bt CRW	101	240	200	177	206	19.8
Farm Advantage	87X00	LL Bt CRW	100	252	191	184	209	20.0
98 to 101 RM averages:				**217**	**192**	**169**	**193**	**17.7**
102 to 103 RM hybrids								
Dekalb	DKC52-43	GLY Bt CRW	102	232	200	167	199	16.8
Kruger	K-6102VT3	GLY Bt CRW	102	209	207	174	196	17.1
Anderson	605VT3	GLY Bt CRW	102	170	197	143	170	17.5
NuTech	3W-403 RR/YGRW	GLY CRW	103	208	188	149	182	17.6
NuTech	3A-403 RR	GLY	103	212	183	167	187	17.8
Dekalb	DKC52-59	GLY Bt CRW	102	246	199	183	210	17.9
Dekalb	DKC53-17	GLY Bt CRW	103	221	165	175	187	18.2
Dairyland	ST-9902	GLY Bt	102	221	157	180	186	18.3
NuTech	1H-803 HX/LL	LL Bt	103	229	196	182	202	18.3
Gold Country	102-04 VT3	GLY Bt CRW	102	235	181	174	197	18.4
Dairyland	ST-9002	LL Bt	102	235	193	178	202	18.4
Wensman	W 7309 VT3	GLY Bt CRW	102	205	178	173	185	18.4

Early maturity hybrids, southern locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Lamberton	Rochester	Waseca	Yield Across Locations Bu/Acre	% Moisture
102 to 103 RM hybrids (continued)								
Viking	LB6938	LL Bt	103	206	207	126	180	18.5
Renk	RK670VT3	GLY Bt CRW	102	233	201	191	208	18.5
Jung	7514 VT3	GLY Bt CRW	102	227	201	183	204	19.0
Pioneer	36V53	GLY LL Bt	102	262	221	213	232	19.1
AgriGold	A6309BtRWRR	GLY Bt CRW	103	224	204	178	202	19.6
Renk	RK686VT3	GLY Bt CRW	102	225	171	178	191	19.8
Midwest Seed Genetics	72116VT3	GLY Bt CRW	102	214	218	184	205	19.9
Wensman	W 7360 BtRWRR	GLY Bt CRW	103	230	171	176	193	20.1
NuTech	3T-303 VT3	GLY Bt CRW	103	236	229	150	205	20.2
Viking	6919 VT3	GLY Bt CRW	102	222	202	182	202	20.3
Farm Advantage	87A03	LL Bt CRW	103	254	231	177	221	20.3
NuTech	5B-103 GT/CB/LL	GLY LL Bt	103	216	231	178	208	20.3
Anderson	103VT3	GLY Bt CRW	103	222	196	190	203	20.4
NuTech	3A-804 GT	GLY	103	245	220	171	212	20.4
NuTech	3T-302 VT3	GLY Bt CRW	102	231	185	188	201	21.3
NuTech	0C-404 YGCB	Bt	103	256	185	190	210	21.8
NuTech	3C-104 RR/YGCB	GLY Bt	103	220	226	171	206	22.7
NuTech	5N-504 GT/CB/LL/RW	GLY LL Bt CRW	103	212	236	181	210	24.6
102 to 103 RM averages:				**225**	**199**	**175**	**200**	**19.4**
Southern locations, early maturity averages:				**217**	**193**	**171**	**193**	**17.9**
LSD(0.20)				**20**	**23**	**22**	**13**	**0.8**

Late maturity hybrids, southern locations, 2008.

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Lamberton	Rochester	Waseca	Average Across Locations Bu/Acre	% Moisture
104 RM and later hybrids								
Kruger	K-6503TS	GLY Bt CRW	103	203	188	142	178	18.1
Dekalb	DKC54-49	GLY Bt CRW	104	218	217	163	199	18.6
Renk	RK698RRYGRW	GLY CRW	104	203	214	167	195	19.0
Viking	D43-06	Bt	106	232	217	159	203	19.2
NuTech	0C-404A YGCB	Bt	104	260	224	160	215	19.3
AgriGold	A6325VT3	GLY Bt CRW	104	229	227	142	200	19.3
Anderson	105R	GLY	105	190	199	145	178	19.4
Legacy	L-5950 VT3	GLY Bt CRW	107	205	215	133	184	19.7
Dekalb	DKC55-82	GLY	105	193	217	185	198	19.9
Legacy	L-5350 CBLLGT	GLY LL Bt	104	230	222	191	215	20.0
Dairyland	ST-9005	GLY Bt CRW	105	215	232	169	205	20.1
Kaltenberg	K5232RRLLBtHX	GLY LL Bt	103	238	223	178	213	20.2
G2 Genetics	1H-005 HX/LL	LL Bt	105	237	229	173	213	20.2
Kruger	K-6606VT3	GLY Bt CRW	106	260	224	150	212	20.2
Anderson	105VT3	GLY Bt CRW	105	214	196	142	184	20.2
Dekalb	DKC57-43	GLY Bt CRW	107	220	213	143	192	20.3
Dairyland	ST-9006	GLY Bt CRW	106	241	225	161	209	20.4
Pioneer	35F40	GLY LL Bt	105	217	227	171	205	20.7
NuTech	3P-507 RR/YGPL	GLY Bt CRW	107	213	210	168	197	20.9
Renk	RK692CBLLRW	LL Bt CRW	105	221	202	154	192	20.9
Kruger	K-6006VT3	GLY Bt CRW	106	213	210	175	199	21.0
Kruger	K-6007TS	GLY Bt CRW	107	238	231	163	211	21.2
Renk	RK719VT3	GLY Bt CRW	107	197	203	140	180	21.3
Wensman	W 7433 VT3	GLY Bt CRW	105	210	239	185	211	21.3
Crows	3848VT3	GLY Bt CRW	105	248	207	172	209	21.5
G2 Genetics	5H-906 RR/HX	GLY LL Bt	106	209	203	154	188	21.5
Midwest Seed Genetics	76126VT3	GLY Bt CRW	105	227	204	149	193	21.8
Renk	RK760RRYGCB	GLY Bt	106	228	187	179	198	21.8

Late maturity hybrids, southern locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Lamberton	Rochester	Waseca	Average Across Locations Bu/Acre	% Moisture
104 RM and later hybrids (continued)								
G2 Genetics	5H-506 RR/HX	GLY LL Bt	106	226	235	180	214	21.8
Farm Advantage	86X06	LL Bt CRW	106	237	213	187	212	22.1
Renk	RK770VT3	GLY Bt CRW	108	227	210	178	205	22.1
Gold Country	106-02 VT3	GLY Bt CRW	106	214	198	163	192	22.2
NuTech	3T-808 VT3	GLY Bt CRW	108	176	217	155	183	22.2
NuTech	3T-809 VT3	GLY Bt CRW	109	225	204	125	184	22.4
NuTech	3T-109 VT3	GLY Bt CRW	109	219	193	152	188	22.8
Kruger	K-6107VT3	GLY Bt CRW	107	218	220	179	206	23.0
NuTech	5X-008 RR/HXT	GLY LL Bt CRW	108	213	199	158	190	23.0
Dekalb	DKC61-69	GLY Bt CRW	111	227	218	164	203	23.1
NuTech	3T-208 VT3	GLY Bt CRW	108	177	187	165	176	23.1
Dairyland	ST-8208	LL Bt CRW	108	231	233	174	213	23.2
G2 Genetics	5H-508 RR/HX	GLY LL Bt	108	218	215	161	198	23.2
Farm Advantage	87X04	LL Bt CRW	104	221	234	165	206	23.3
NuTech	3P-708 RR/YGPL	GLY Bt CRW	108	198	212	162	191	23.4
Wensman	W 7455 VT3	GLY Bt CRW	107	243	235	195	225	23.6
NuTech	1X-606 HXT/LL	LL Bt	106	238	208	173	206	23.8
Kruger	K-6208VT3	GLY Bt CRW	108	230	215	183	209	23.8
Midwest Seed Genetics	76485 VT3	GLY Bt CRW	107	219	216	192	209	24.0
Crows	4354VT3	GLY Bt CRW	107	246	217	187	217	24.5
Southern locations, late maturity averages:				**221**	**214**	**165**	**200**	**21.4**
LSD(0.20)				**24**	**20**	**22**	**13**	**1.0**

Early maturity hybrids, central locations, 2008.

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Morris	Rosemount	Average Across Locations Bu/Acre	% Moisture
93 and earlier RM hybrids							
Farm Advantage	9890GL	GLY LL Bt	90	176	101	139	15.5
Pioneer	39D97	GLY LL Bt	79	61	119	90	16.8
Kruger	K-2090RR/YGCB	GLY Bt	90	192	152	172	17.0
Dekalb	DKC35-19	GLY Bt	85	163	112	138	17.5
Kruger	K-1490RR	GLY	90	201	149	175	17.8
Wensman	W 7107 VT3	GLY Bt CRW	90	177	138	158	17.8
Peterson Farms Seeds	82L90	GLY LL Bt	90	181	137	159	18.1
Peterson Farms Seeds	56I92	GLY Bt CRW	92	200	138	169	18.2
Wensman	W 7143 VT3	GLY Bt CRW	93	174	152	163	18.3
NuTech	3A-390A RR	GLY	90	218	151	185	18.4
Crows	1685VT3	GLY Bt CRW	92	180	165	173	18.5
Midwest Seed Genetics	69205VT3	GLY Bt CRW	92	204	157	181	18.7
NuTech	3P-494+ RR/YGPL	GLY Bt CRW	92	208	175	192	18.7
Kruger	K-6093VT3	GLY Bt CRW	93	179	172	176	18.7
Dahlman	R45-25 VT3	GLY Bt CRW	90	186	160	173	18.9
Dekalb	DKC41-60	GLY Bt CRW	91	206	160	183	18.9
Gold Country	92-03 VT3	GLY Bt CRW	92	189	143	166	18.9
Dekalb	DKC43-27	GLY Bt CRW	93	191	172	181	19.0
NuTech	3T-393A VT3	GLY Bt CRW	92	216	195	206	19.1
NuTech	3P-191 RR/YGPL	GLY Bt CRW	91	190	158	174	19.2
Jung	7344 VT3	GLY Bt CRW	91	184	172	178	19.3
NuTech	3C-393 RR/YGCB	GLY Bt	93	214	164	189	19.3
NuTech	3A-095A RR	GLY	92	200	178	189	19.6
NuTech	3T-393 VT3	GLY Bt CRW	93	207	167	187	19.6
Dekalb	DKC38-89	GLY Bt CRW	88	191	123	157	19.8
NuTech	3A-093 RR	GLY	92	186	144	165	19.9
Terning	TS Exp 9 Plus	GLY LL Bt	90	192	155	173	21.2
93 RM and earlier averages:				**188**	**152**	**170**	**18.6**

Early maturity hybrids, central locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Morris	Rosemount	Average Across Locations Bu/Acre	% Moisture
93 and earlier RM hybrids (continued)							
NuTech	3P-494A RR/YGPL	GLY Bt CRW	94	206	152	179	17.2
Farm Advantage	9794L	LL Bt	94	182	138	160	17.3
NuTech	3T-495 VT3	GLY Bt CRW	95	183	192	188	17.8
Gold Country	94-04 VT3	GLY Bt CRW	94	179	145	162	18.1
Legacy	L-3295 VT3	GLY Bt CRW	96	180	162	171	18.5
Kruger	K-6094VT3	GLY Bt CRW	94	191	150	170	18.6
Dairyland	ST-9196	GLY Bt CRW	96	184	155	169	18.6
Terning	TS 8245 GTCBLL	GLY LL Bt	95	197	138	168	18.7
Renk	RK501YGCB	Bt	95	191	157	174	18.7
Dahlman	R48-07 VT3	GLY Bt CRW	95	189	163	176	18.8
Pioneer	38M58	GLY LL Bt	94	188	160	174	18.9
Jung	7362 VT3	GLY Bt CRW	94	183	164	173	19.0
Seeds 2000	9501 VT3	GLY Bt CRW	95	196	143	170	19.3
Kaltenberg	K4013VT3	GLY Bt CRW	94	202	150	176	19.4
NuTech	3A-095 RR	GLY	95	194	132	163	19.4
Dahlman	R48-25 VT3	GLY Bt CRW	95	202	127	165	19.6
Kruger	K-1295RR	GLY	95	220	166	193	19.6
Gold Country	96-08 VT3	GLY Bt CRW	96	218	178	198	19.7
NuTech	3T-995 VT3	GLY Bt CRW	95	195	133	164	19.7
Renk	RK570VT3	GLY Bt CRW	96	194	149	171	19.7
Jung	3385 RR	GLY	94	215	141	178	19.9
Peterson Farms Seeds	56G95	GLY Bt CRW	95	194	142	168	20.1
Peterson Farms Seeds	53Y96	GLY Bt CRW	96	161	148	155	20.1
NuTech	3T-098 VT3	GLY Bt CRW	95	215	175	195	20.1
Jung	7426 VT3	GLY Bt CRW	96	192	150	171	20.2
Legacy	L-3333 VT3	GLY Bt CRW	95	215	152	183	20.2
Crows	1725VT3	GLY Bt CRW	95	191	165	178	20.5
NuTech	3T-595 VT3	GLY Bt CRW	95	210	170	190	20.5
Midwest Seed Genetics	69575VT3	GLY Bt CRW	95	207	136	171	20.7
Dekalb	DKC46-60	GLY Bt CRW	96	186	153	170	20.8
NuTech	3A-098 RR	GLY	96	224	151	187	21.1
NuTech	3T-098A VT3	GLY Bt CRW	96	221	165	193	21.3
Proseed	896VT3	GLY Bt CRW	96	204	147	176	21.7
Farm Advantage	5795	LL Bt	95	184	144	164	21.8
NuTech	3T-096A VT3	GLY Bt CRW	95	191	157	174	21.8
NuTech	5H-597 RR/HX	GLY LL Bt	96	225	150	188	23.4
94 to 96 RM averages:				**198**	**153**	**175**	**19.7**
Central locations, early maturity averages:				**193**	**153**	**173**	**19.3**
LSD(0.20)				**20**	**27**	**16**	**0.9**

Late maturity hybrids, central locations, 2008.

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Morris	Rosemount	Average Across Locations Bu/Acre	% Moisture
99 and earlier RM hybrids							
Kruger	K-6697VT3	GLY Bt CRW	97	164	142	153	19.6
Proseed	897RR	GLY	97	191	99	145	19.9
Wensman	W 7273 VT3	GLY Bt CRW	98	185	153	169	20.5
Dekalb	DKC49-32	GLY Bt CRW	99	189	122	156	20.8
Kruger	K-1500RR	GLY	99	204	135	169	21.6
Midwest Seed Genetics	69805VT3	GLY Bt CRW	98	189	117	153	22.1
Dahlman	R49-28 VT3	GLY Bt CRW	98	184	154	169	22.2
NuTech	5N-898 GT/CB/LL/RW	GLY LL Bt CRW	97	190	121	156	22.2
NuTech	3T-099 VT3	GLY Bt CRW	98	196	106	151	22.3
Kruger	K-6298VT3	GLY Bt CRW	98	195	135	165	22.5
Dairyland	ST-9799	GLY Bt CRW	99	190	112	151	22.5
Kruger	K-6499VT3	GLY Bt CRW	99	219	128	174	22.6

Late maturity hybrids, central locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Morris	Rosemount	Average Across Locations Bu/Acre	% Moisture
99 and earlier RM hybrids (continued)							
Seeds 2000	9901 VT3	GLY Bt CRW	99	187	115	151	22.6
Kruger	K-6097VT3	GLY Bt CRW	97	198	116	157	22.7
Farm Advantage	87A99GL	GLY LL Bt CRW	99	190	144	167	22.7
G2 Genetics	5H-298 RR/HX	GLY LL Bt	97	197	140	168	22.7
NuTech	3P-098 RR/YGPL	GLY Bt CRW	98	211	113	162	23.0
Jung	7454 VT3	GLY Bt CRW	98	190	128	159	23.0
Gold Country	98-10 VT3	GLY Bt CRW	98	195	135	165	23.1
NuTech	1N-398 CB/LL/RW	LL Bt CRW	97	198	145	172	23.2
Wensman	W 7267 VT3	GLY Bt CRW	97	172	142	157	23.2
NuTech	3T-096 VT3	GLY Bt CRW	97	186	106	146	23.3
NuTech	3P-098A RR/YGPL	GLY Bt CRW	98	210	131	170	23.4
Peterson Farms Seeds	53B97	GLY Bt CRW	97	191	124	158	23.6
Renk	RK584CBLL	LL Bt	99	185	96	140	23.6
NuTech	3T-500 VT3	GLY Bt CRW	97	194	140	167	23.7
Crows	1928R	GLY	99	184	149	166	23.7
Legacy	L-4050 VT3	GLY Bt CRW	99	198	116	157	23.8
Legacy	L-3750 VT3	GLY Bt CRW	97	189	121	155	24.1
Wensman	W 7289 VT3	GLY Bt CRW	99	217	152	184	24.2
Pioneer	37Y14	GLY LL Bt CRW	99	195	123	159	24.4
NuTech	5H-597A RR/HX	GLY LL Bt	97	180	149	164	24.6
NuTech	3C-300 RR/YGCB	GLY Bt	97	214	132	173	24.9
NuTech	5H-599 RR/HX	GLY LL Bt	97	195	148	171	25.7
99 RM and earlier averages:				**193**	**129**	**161**	**22.9**
Later than 99 RM hybrids							
Gold Country	100-07 VT3	GLY Bt CRW	100	190	120	155	21.0
Dekalb	DKC52-43	GLY Bt CRW	102	189	141	165	21.2
Jung	7482 VT3	GLY Bt CRW	100	203	121	162	21.5
Dekalb	DKC52-59	GLY Bt CRW	102	171	137	154	21.8
Proseed	8100CBLLGT	GLY LL Bt	100	188	113	150	21.9
Renk	RK616VT3	GLY Bt CRW	101	197	131	164	22.0
NuTech	3W-403 RR/YGRW	GLY CRW	103	194	129	162	22.4
Kaltenberg	K5163VT3	GLY Bt CRW	103	172	126	149	22.4
Hyland Seeds	HL B45R	GLY Bt	100	159	128	144	23.1
Midwest Seed Genetics	70505VT3	GLY Bt CRW	101	198	100	149	23.1
NuTech	3C-300A RR/YGCB	GLY Bt	100	197	127	162	23.2
Kruger	K-6102VT3	GLY Bt CRW	102	228	114	171	23.2
Kruger	K-6400TS	GLY Bt CRW	100	198	97	148	23.2
Dairyland	ST-9902	GLY Bt	102	181	140	161	23.2
Dairyland	ST-9002	LL Bt	102	170	121	146	23.3
Proseed	8101VT3	GLY Bt CRW	101	180	146	163	23.5
Peterson Farms Seeds	39C02	GLY Bt	102	204	112	158	23.5
Jung	7475 VT3	GLY Bt CRW	100	183	95	139	23.6
G2 Genetics	5H-501 RR/HX	GLY LL Bt	101	190	163	176	23.7
Kruger	K-6401VT3	GLY Bt CRW	101	228	98	163	23.7
NuTech	3T-500A VT3	GLY Bt CRW	100	203	100	151	23.9
Wensman	W 7309 VT3	GLY Bt CRW	102	189	122	156	24.2
Dekalb	DKC50-19	GLY Bt CRW	100	197	85	141	24.3
Dekalb	DKC53-17	GLY Bt CRW	103	202	139	171	24.3
G2 Genetics	5H-702 RR/HX	GLY LL Bt	101	201	124	163	24.3
Dekalb	DKC50-44	GLY Bt CRW	100	221	125	173	24.8
Hyland Seeds	HL B49R	GLY Bt	100	199	170	185	25.1
NuTech	3T-101+ VT3	GLY Bt CRW	101	173	108	140	25.3
Legacy	L-5350 CBLLGT	GLY LL Bt	104	180	131	155	25.3
NuTech	3P-302 RR/YGPL	GLY Bt CRW	101	190	166	178	25.5
NuTech	3T-303 VT3	GLY Bt CRW	103	177	126	151	25.7
Dairyland	ST-9005	GLY Bt CRW	105	222	133	177	25.8
Farm Advantage	87X00	LL Bt CRW	100	170	117	143	26.0
Crows	2155VT3	GLY Bt CRW	102	203	140	171	26.0
Renk	RK686VT3	GLY Bt CRW	102	207	126	166	26.3
Hyland Seeds	HL B52R	GLY Bt	101	176	149	162	26.5

Late maturity hybrids, central locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/Acre at: Morris	Rosemount	Average Across Locations Bu/Acre	% Moisture
Later than 99 RM hybrids (continued)							
Kruger	K-3300RR/HX	GLY Bt	100	201	102	151	26.6
NuTech	5X-201+ HXT/RR	GLY LL Bt CRW	101	185	90	138	26.6
Dairyland	ST-8404	LL Bt	104	159	141	150	28.3
Hyland Seeds	HL B337	Bt	105	170	105	137	28.4
Later than 99 RM averages:				**191**	**124**	**158**	**24.2**
Central locations, late maturity averages:				**192**	**126**	**159**	**23.6**
LSD(0.20)				**23**	**29**	**18**	**1.1**

Northern Locations, 2008.

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/acre at: Rothsay	Staples	Crookston	Average Across Locations Bu/Acre	% Moisture
82 and earlier RM hybrids								
Kruger	K-1178RR	GLY	78	156	142	148	149	20.0
Pioneer	39D97	GLY LL Bt	79	157	136	152	148	20.8
Kruger	K-1780RR	GLY	80	151	135	152	146	21.4
NuTech	3C-482 RR/YGCB	GLY Bt	82	162	136	142	147	22.7
Pioneer	39V07	GLY LL Bt	80	143	137	133	138	22.8
NuTech	3T-083 VT3	GLY Bt CRW	82	181	160	162	168	23.0
Seeds 2000	8201 VT3	GLY Bt CRW	82	182	133	145	154	23.3
NuTech	3A-887 GT	GLY	82	172	131	161	155	23.5
NuTech	3P-484 RR/YGPL	GLY Bt CRW	82	160	138	156	151	23.8
Hyland Seeds	HL B24R	GLY Bt	81	171	143	159	158	25.2
NuTech	3T-484 VT3	GLY Bt CRW	82	180	159	160	166	25.3
Proseed	781RRBT	GLY Bt	81	156	143	158	153	25.7
82 and earlier RM averages:				**164**	**141**	**153**	**153**	**23.1**
83 to 87 RM hybrids								
Kruger	K-1086RR	GLY	86	170	166	170	169	20.5
Kruger	K-1584RR	GLY	84	162	131	155	150	21.4
Dekalb	DKC33-54	GLY	83	169	146	148	154	22.1
Mycogen	2J272	GLY Bt	87	172	143	173	163	22.2
Wensman	W 7087 VT3	GLY Bt CRW	85	170	135	172	159	22.2
Jung	4183 RR/YGCB	GLY Bt	85	172	156	172	167	22.2
Kruger	K-1087RR	GLY	87	159	154	156	156	22.3
Hyland Seeds	HL R228	GLY	85	161	155	149	155	22.3
Dahlman	D43-56 CBLL	LL Bt	86	197	122	183	167	22.3
Jung	4288 RR/YGCB	GLY Bt	86	182	148	164	165	22.4
Kruger	K-2087RR/YGCB	GLY Bt	87	172	144	167	161	22.4
Proseed	786CBLLGT	GLY LL Bt	86	175	148	163	162	22.6
Renk	RK292CBLLL	LL Bt	85	187	154	176	172	22.7
Gold Country	87-01 CB	Bt	87	184	152	155	164	22.8
Dekalb	DKC35-19	GLY Bt	85	175	158	164	166	22.8
Kruger	K-2086RR/YGCB	GLY Bt	86	183	145	157	162	22.9
NuTech	3T-388 VT3	GLY Bt CRW	87	184	167	162	171	23.0
Dairyland	ST-7985	LL Bt	85	192	128	172	164	23.0
Jung	7171VT3	GLY Bt CRW	83	178	140	164	161	23.1
Midwest Seed Genetics	68101R	GLY	85	155	149	146	150	23.2
Crows	1466R	GLY	85	158	161	154	158	23.2
NuTech	1B-887 CB/LL	LL Bt	87	195	137	174	169	23.2
Peterson Farms Seeds	54M83	GLY Bt CRW	83	180	147	159	162	23.3
Mycogen	2P174	GLY Bt	84	161	144	158	154	23.5
Peterson Farms Seeds	27L84	GLY Bt	84	159	154	165	159	23.7
NuTech	1N-887 CB/LL/RW	LL Bt CRW	86	197	138	166	167	23.8
Hyland Seeds	HL R231	GLY	87	165	140	150	152	23.8
Peterson Farms Seeds	56J86	GLY Bt CRW	86	183	149	164	165	23.8

Northern Locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/acre at:			Average Across Locations	
				Rothsay	Staples	Crookston	Bu/Acre	% Moisture
83 to 87 RM hybrids (continued)								
Wensman	W 7085 VT3	GLY Bt CRW	84	161	146	166	158	24.2
Renk	RK268YGPL	GLY Bt CRW	84	173	156	147	159	24.3
Mycogen	2T220	GLY Bt CRW	86	178	154	159	164	24.4
Mycogen	2K154	GLY LL Bt	83	176	145	160	161	24.4
Proseed	884VT3	GLY Bt CRW	84	169	149	156	158	24.4
Dairyland	ST-7286	GLY Bt	86	179	144	162	162	24.5
Legacy	L-2820 CBLLRW	LL Bt CRW	86	199	135	175	170	25.0
Dahlman	R43-42 VT3	GLY Bt CRW	86	173	148	168	163	25.0
Wensman	W 7089 VT3	GLY Bt CRW	86	196	161	172	177	25.2
NuTech	3A-390 RR	GLY	87	180	175	148	168	25.3
Proseed	787VT3	GLY Bt CRW	87	191	143	155	163	25.4
Legacy	L-2850 VT3	GLY Bt CRW	87	196	160	166	174	25.4
83 to 87 RM averages:				**177**	**148**	**162**	**162**	**23.3**
88 to 92 RM hybrids								
Farm Advantage	9890GL	GLY LL Bt	90	174	130	177	160	22.7
Kruger	K-1490RR	GLY	90	183	154	165	167	22.9
Dairyland	ST-7891	GLY LL Bt	91	175	145	182	168	23.0
Dahlman	D45-22 CBLL	LL Bt	88	200	141	158	166	23.0
Peterson Farms Seeds	82L90	GLY LL Bt	90	189	140	183	171	23.2
Kruger	K-5388YGCB	GLY Bt	88	181	157	152	163	23.3
Hyland Seeds	HL CVR44	GLY Bt CRW	88	167	143	139	150	23.6
Jung	3327RR	GLY	89	184	161	157	167	23.8
NuTech	3A-390A RR	GLY	90	179	163	154	166	23.8
Dairyland	ST-7789	GLY Bt	89	178	171	158	169	24.0
Kruger	K-2090RR/YGCB	GLY Bt	90	181	146	158	162	24.0
NuTech	3P-191 RR/YGPL	GLY Bt CRW	91	189	163	167	173	24.8
Seeds 2000	8801 VT3	GLY Bt CRW	88	186	156	170	171	24.8
NuTech	3T-393A VT3	GLY Bt CRW	92	196	172	172	180	24.9
Midwest Seed Genetics	69205VT3	GLY Bt CRW	92	182	160	171	171	25.0
Legacy	L-2927 VT3	GLY Bt CRW	92	185	151	151	162	25.1
Wensman	W 7107 VT3	GLY Bt CRW	90	184	156	152	164	25.2
NuTech	3T-388A VT3	GLY Bt CRW	88	187	151	166	168	25.2
Hyland Seeds	HL R238	GLY	92	181	164	146	164	25.6
Hyland Seeds	HL CVR54	GLY Bt CRW	92	198	160	154	171	25.6
Crows	1685VT3	GLY Bt CRW	92	182	152	181	172	25.7
Dekalb	DKC38-89	GLY Bt CRW	88	188	161	175	175	25.8
Pioneer	39N99	GLY LL Bt	89	169	156	169	165	26.0
NuTech	3P-494+ RR/YGPL	GLY Bt CRW	92	185	142	168	165	26.3
Renk	RK438YGCB	Bt	92	189	154	159	167	26.5
Dekalb	DKC41-60	GLY Bt CRW	91	179	166	160	168	26.6
NuTech	3A-095A RR	GLY	92	183	148	172	168	27.0
Jung	7344 VT3	GLY Bt CRW	91	179	139	162	160	27.4
NuTech	3A-093 RR	GLY	92	176	126	153	152	27.8
88 to 92 RM averages:				**183**	**153**	**163**	**166**	**24.9**
93 and later RM hybrids								
Jung	3385 RR	GLY	94	196	172	160	176	24.0
NuTech	3P-494A RR/YGPL	GLY Bt CRW	94	194	162	147	168	24.1
NuTech	3T-995 VT3	GLY Bt CRW	95	186	164	168	172	24.1
Proseed	794CBLLRW	LL Bt CRW	94	176	148	153	159	24.5
Kruger	K-1093RR	GLY	93	200	155	164	173	25.0
NuTech	3T-495 VT3	GLY Bt CRW	95	196	144	161	167	25.1
NuTech	3T-393 VT3	GLY Bt CRW	93	209	149	160	173	25.4
Proseed	793CBLL	LL Bt	93	175	136	153	155	25.7
Proseed	894VT3	GLY Bt CRW	94	183	158	155	165	25.7
Dekalb	DKC43-27	GLY Bt CRW	93	195	153	161	170	25.8
Jung	7362 VT3	GLY Bt CRW	94	191	179	155	175	26.1
Wensman	W 7143 VT3	GLY Bt CRW	93	169	161	154	161	26.2

Northern Locations, 2008 (continued).

Source/Brand	Hybrid	Traits	Relative Maturity	Yield, Bushels/acre at: Rothsay	Staples	Crookston	Average Across Locations Bu/Acre	% Moisture
93 and later RM hybrids (continued)								
NuTech	3T-995A VT3	GLY Bt CRW	95	183	171	174	176	26.2
Kruger	K-6094VT3	GLY Bt CRW	94	187	153	158	166	26.2
Dairyland	ST-9194	GLY Bt CRW	94	196	156	151	168	26.5
Kruger	K-6093VT3	GLY Bt CRW	93	189	140	170	166	26.6
NuTech	3T-096A VT3	GLY Bt CRW	95	175	147	152	158	26.9
NuTech	3A-095 RR	GLY	95	185	157	145	163	26.9
NuTech	3T-096B VT3	GLY Bt CRW	95	164	137	151	151	27.2
NuTech	3P-595 RR/YGPL	GLY Bt CRW	95	209	137	166	170	27.5
NuTech	3T-098 VT3	GLY Bt CRW	95	192	172	155	173	28.0
93 and later RM averages:				**188**	**155**	**158**	**167**	**25.9**
Northern locations averages:				**179**	**150**	**161**	**163**	**24.3**
LSD(0.20)				**11**	**16**	**13**	**8**	**1.1**

Minnesota Agricultural Experiment Station
UNIVERSITY OF MINNESOTA

Varietal Trials Results

January 2009

Corn Silage

Craig Sheaffer and Doug Swanson

The Minnesota Hybrid Corn Silage Evaluation Program evaluates the silage potential of corn hybrids in Minnesota. The goal of the program is to provide unbiased forage yield and quality information for educational and marketing programs.

The program is financed in part by entry fees from private seed companies that chose to enter hybrids for testing. These companies are listed in this publication. Results presented are from corn silage performance trials in regions of extensive corn silage use: southeastern, central and west-central Minnesota. The locations are in important dairy regions of Minnesota.

Test Sites

Silage hybrids entered in the southeast or central region trials were tested at two sites within each region. Hybrids entered in the west-central region were tested at one site. Sites within regions were as follows:

Southeast Dairy Region:
LaCrescent (Houston County)
Rochester (Olmsted County)

Central Dairy Region:
Paynesville (Stearns County)
Melrose (Stearns County)

West-Central Dairy Region:
Ottertail (Otter Tail County)

Test Procedure

Southeast and Central

Design: Plots were established at LaCrescent, Rochester, Paynesville and Melrose in randomized complete block designs with four replications. Hybrids were planted at 33,000 seeds per acre with 30-inch row spacing on May 3 at the SE sites (LaCrescent and Rochester) and May 7 at the Central MN sites (Paynesville and Melrose). Plant nutrients as manure or inorganic fertilizer were applied according to University of Minnesota recommendation. Cultivation and herbicides applied by University of Minnesota recommendation were used to control weeds.

Harvesting: Plots were harvested and whole-plant herbage sampled for dry matter and forage quality analysis at each site. Each test site was harvested when the average whole-plant moisture across entries was estimated to be 65%. In 2008, harvest dates at LaCrescent, Rochester, Paynesville and Melrose were September 9, September 16, September 23 and September 26, respectively.

West-Central

Design: Plots near Ottertail were established May 8 under center-pivot irrigation in a randomized complete block design with three replications. Hybrids were planted at 35,700 seeds per acre with 30-inch row spacing. Fertilizer was fall-applied liquid manure at 8,000 gallons per acre plus 25 gallons per acre 28% in July. Pre-emergent herbicide was applied to control weeds.

Harvesting: Plots were harvested and whole-plant herbage sampled for yield and forage quality analysis on September 24.

Results Provided

Tables 1-5 summarize hybrid yield and forage quality results from LaCrescent, Rochester, Paynesville, Melrose and Ottertail, respectively.

Companies participating in 2008 hybrid corn silage performance trials.

Crop Production Services (VIGORO)	220 Bottemiller Dr., Wadena Industrial Park, Wadena, MN 56482	www.cropproductionservices.com
Dairyland Seed Co, Inc.	P O Box 958, West Bend, WI 53095	www.dairylandseed.com
Dekalb (Monsanto Co)	800 N Lindberg Blvd., St Louis, MO 63167	www.dekalb.com
Fielder's Choice Direct	306 North Main, P O Box 898, Monticello, IN 47960	www.fielderschoicedirect.com
Garst Seed Company	2369 330th St, Slater, IA 50244	www.garst.seed
Gold Country Seed Inc.	16506 Hwy 15 North, P O Box 604, Hutchinson, MN 55350	www.goldcountryseed.com
Golden Harvest Seeds, Inc.	100 JC Robinson Blvd, P O Box 307, Waterloo, NE 68069	www.goldenharvestseeds.com
Heartland Hybrids	850 1st St North, P O Box J, Dassel, MN 55325	www.heartlandhybrids.com
Hyland Seeds	2 Hyland Drive, Blenheim, Ontario, Canada N0P 1A0	www.hylandseeds.com
La Coop Federee (ELITE)	9001 Blvd de L' Acadia, Bureau 200, Montreal, Quebec, Canada H4N 3H7	www.coopfed.qc.ca
Legacy Seeds, Inc.	210 Pine Street, Waupaca, WI 54981	www.legacyseeds.com
Mycogen Seeds	9330 Zionsville Rd, Indianapolis, IN 46268	www.mycogen.com
Nu Tech Seed Co.	307 3rd Street, Alice, ND 58031	www.yieldleader.com
Pioneer Hi-Bred, International	7000 NW 62nd Ave, Johnston, IA 50131	www.pioneer.com
Producers Hybrids	P.O. Box C, Battle Creek, NE 68715	www.producershybrids.com
Renk Seed Co.	6800 Wilburn Road, Sun Prairie, WI 53590	www.renkseed.com
Trelay Seeds	11623 State Road 80N, Livingston, WI 53554	www.trelay.com
Wensman Seed Co.	Box 190, Wadena, MN 56482	www.wensmanseed.com

Moisture content, whole-plant dry matter (DM) yield and silage yield are listed, and hybrids are ranked in descending order of milk yield per acre (Milk Yield, lb/acre). Genetic trait information is supplied by companies entered in the hybrid corn silage performance trial.

Whole-plant forage quality traits listed include crude protein (CP), neutral detergent fiber (NDF), 48-hour *in vitro* digestibility (IVD), 48-hour neutral detergent fiber digestibility (NDFD), and starch concentration. With the exception of NDFD, all forage quality traits are expressed as a percent of dry matter. NDFD is expressed as a percent of NDF.

Milk production potentials per ton (lb milk/ton forage) and per acre (lb milk/acre forage) of forage were calculated using the MILK2006 spreadsheet developed by the University of Wisconsin. MILK2006 approximates animal performance based on a standard cow weight and milk production level (1,350-lb body weight and 90 lb/day at 3.8% fat). Field values for moisture and DM yield at harvest; laboratory values for CP, NDF, NDFD, starch, oil and ash concentration; and book values for NDFCP (1.3%) were used for spreadsheet calculations. For MILK2006 predictions, we assumed that kernel processing occurred.

How To Use Results

NDF is a negative indicator of forage intake potential; higher NDF concentration generally implies lower animal performance potential. IVD provides an estimate of forage dry matter digestibility, and NDFD estimates digestibility of the fiber fraction. Starch concentration is positively associated with digestibility because it is assumed to be 100% digestible. Relatively higher IVD, NDFD and/or starch concentrations generally imply greater animal performance potential. Milk yield per acre represents the combined effects of yield and quality.

Corn hybrids differed in yield, forage quality, and milk production potential at all sites. Means and least significant difference (LSD) values at the 10% probability level are shown for each parameter at each site. Where the difference between two hybrids for a particular yield or quality trait is greater than the LSD value, there is a 90% probability that there is a significant difference between the two hybrids for that parameter (i.e. moisture, yield, quality concentration or milk production).

Test Plot Research

Test plot establishment and management were supervised by T.R. Hoverstad, M.D. Bickell, L.M. Behnken, F.R. Breitenbach, D.L. Holen, V.W. Crary and D.C. Martens.

Table 1. Relative maturity (RM), whole-plant moisture (Moist), dry matter and silage yield, and quality traits for corn hybrids planted at La Crescent (Houston County) in 2008.

		RM,	Moist	Yield, Ton/Acre [2]		Quality (Concentration), % [3]					Milk Yield [4]	
Brand/ Hybrid Entry	Traits[1]	Rating	%	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/ Ton	Lb/ Acre
Dekalb / DKC61-69	Bt,CRW,GLY	111	67.6	11.1	34.4	8.6	41	77	39	34	3,440	38,300
Producers Hybrids/ 7325VT3	Bt,CRW,GLY	113	69.1	10.9	35.2	8.6	44	77	44	31	3,490	38,000
Midwest Seed Genetics/ 76126VT3	Bt,CRW,GLY	105	66.0	10.8	31.7	8.6	45	73	43	31	3,470	37,400
Dekalb / DKC57-43	Bt,CRW,GLY	107	69.2	11.1	35.9	8.5	47	70	40	28	3,250	36,000
Pioneer Brand/ 34A89	Bt,CRW,GLY,LL	110	67.8	10.7	33.3	8.9	46	72	42	29	3,360	36,000
Crow's/ 4822B	Bt	107	67.2	10.5	31.9	8.6	44	74	41	31	3,400	35,600
Crow's/ 3848VT3	Bt,CRW,GLY	105	65.5	10.4	30.2	8.4	47	75	43	30	3,400	35,500
Mycogen/ TMF 2Q716	Bt,CRW,GLY	110	69.0	10.1	32.6	8.8	45	74	44	31	3,470	35,100
Renk/ RK844VT3	Bt,CRW,GLY	112	69.4	10.3	33.5	9.0	45	74	44	30	3,420	35,100
Nu Tech Seed/ 31-310 VT3	Bt,CRW,GLY	110	68.0	10.3	32.1	8.5	46	70	41	30	3,370	34,600
Legacy Seeds/ L-5350 CBLLGT	Bt,GLY,LL	104	66.7	10.2	30.7	9.0	43	74	40	31	3,340	34,200
Mycogen/ TMF 2W587	Bt,CRW	105	68.0	9.9	30.8	9.3	45	70	46	31	3,470	34,200
Renk/ RK829VT3	Bt,CRW,GLY	112	68.6	10.4	33.1	8.4	47	71	40	28	3,250	33,800
G2 Genetics/ 1X-911 HXT/LL	Bt,CRW,LL	111	70.8	10.1	34.4	9.6	46	72	43	27	3,350	33,600
Gold Country Seed/ 100-11 SSVT3	Bt,CRW,GLY,LL	100	65.9	9.8	28.8	8.6	45	76	42	30	3,380	33,200
Midwest Seed Genetics/ 76865VT3	Bt,CRW,GLY	109	69.4	9.9	32.4	8.8	44	73	40	31	3,350	33,200
Fielders Choice/ NG 6720	Bt,CRW,GLY	108	67.4	10.2	31.3	7.6	46	73	38	29	3,220	32,800
Midwest Seed Genetics/ 76996VT3	Bt,CRW,GLY	109	67.1	9.8	29.9	8.6	47	70	42	29	3,330	32,800
Renk/ RK692CBLLRW	Bt,CRW,LL	105	63.4	9.4	25.8	8.7	43	74	45	34	3,470	32,700
Trelay/ 77231	Bt,CRW,GLY	111	69.8	9.9	32.7	9.1	46	72	41	31	3,320	32,700
Crow's/ 4354VT3	Bt,CRW,GLY	107	68.3	9.7	30.6	8.2	44	69	39	30	3,320	32,200
Legacy Seeds/ L-6600 HX	Bt,LL	110	72.6	10.2	37.1	9.1	50	68	41	24	3,130	31,900
Dekalb / DKC52-59	Bt,CRW,GLY	102	68.9	9.7	31.3	8.8	47	71	42	28	3,260	31,800
Trelay/ 67226	Bt,CRW,GLY	106	68.1	10.0	31.2	8.7	50	71	41	26	3,180	31,700
Renk/ RK698RRYGRW	CRW,GLY	104	65.9	9.0	26.4	8.3	43	74	42	33	3,460	31,100
Fielders Choice/ NG 6686	Bt,CRW,GLY	107	67.2	9.4	28.5	8.3	49	74	42	28	3,300	30,800
Dairyland/ HiD.F.-3104		104	68.6	9.8	31.1	7.8	49	71	40	25	3,140	30,600
Midwest Seed Genetics/ 76485VT3	Bt,CRW,GLY	107	69.6	9.3	30.5	9.0	47	68	41	28	3,270	30,400
Gold Country Seed/ 98-11 SSRR	GLY,LL	98	66.3	9.2	27.3	8.1	45	76	40	29	3,280	30,200
Pioneer Brand/ 34B41	Bt,CRW,GLY,LL	110	69.7	10.1	33.5	8.5	50	71	37	23	2,980	30,200
Dairyland/ HiD.F.-3110-6	GLY	110	69.7	10.2	33.7	8.2	51	68	37	22	2,940	30,000
Dekalb / DKC55-82	GLY	105	69.7	9.3	30.7	9.2	50	73	42	27	3,200	29,800
Dairyland/ HiD.F.-3008-4	CRW,GLY	108	69.8	9.4	31.3	8.4	49	73	40	26	3,120	29,500
Crow's/ 1928R	GLY	99	65.4	9.0	26.1	8.5	46	73	40	29	3,260	29,400

Table 1 (continued). Relative maturity (RM), whole-plant moisture (Moist), dry matter and silage yield, and quality traits for corn hybrids planted at La Crescent (Houston County) in 2008.

Brand/ Hybrid Entry	Traits[1]	RM, Rating	Moist %	Yield, Ton/Acre [2] DM	Silage	Quality (Concentration), % [3] CP	NDF	IVD	NDFD	Starch	Milk Yield [4] Lb/ Ton	Lb/ Acre
Jung Seed Genetics/ HDS 76V78		107	66.9	9.5	28.8	7.7	48	72	37	25	3,060	29,200
Dekalb / DKC50-44	Bt,CRW,GLY	100	69.9	9.0	30.0	8.9	49	71	41	28	3,190	28,800
Dekalb / DKC55-24	Bt,CRW,GLY	105	67.8	9.3	28.9	9.0	51	70	40	24	3,060	28,500
Dekalb / DKC54-49	Bt,CRW,GLY	104	69.9	9.3	30.8	8.4	50	69	39	25	3,060	28,400
Crow's/ 2123VT3	Bt,CRW,GLY	101	70.2	8.8	29.5	8.4	50	72	42	25	3,210	28,300
G2 Genetics/ 1X-716 HXT/LL	Bt,CRW,LL	116	73.3	9.0	33.6	9.1	50	72	40	23	3,120	28,000
Midwest Seed Genetics/ 70006R	GLY	99	67.8	8.8	27.3	8.5	48	71	39	27	3,140	27,600
Nu Tech Seed/ 0C-413 YGCB	Bt,CRW	113	69.5	8.8	28.9	8.2	49	70	39	26	3,130	27,600
Jung Seed Genetics/ HDS 7113QRR/YGP	Bt,CRW,GLY	113	70.2	8.9	29.7	8.5	51	72	41	23	3,090	27,400
Jung Seed Genetics/ HDS 66W46		104	65.6	8.8	25.6	8.3	51	70	40	27	3,080	27,200
Producers Hybrids/ 6634VT3	Bt,CRW,GLY	106	68.0	9.2	28.6	9.0	52	71	39	24	2,970	27,200
Renk/ RK770VT3	Bt,CRW,GLY	108	72.8	8.6	31.8	9.5	50	71	41	26	3,140	27,100
Jung Seed Genetics/ HDS 7105VT3	Bt,CRW,GLY	109	70.6	8.2	28.0	8.8	49	70	41	26	3,170	26,100
Dekalb / DKC53-17	Bt,CRW,GLY	103	70.2	7.5	25.2	9.1	50	72	40	23	3,060	22,900
Mean	—	—	68.5	9.7	30.8	8.6	47	72	41	28	3,250	31,400
LSD(0.10)	—	—	2.5	1.1	3.4	0.6	5	4	3	5	ns	5,300
CV	—	—	3.1	9.7	9.6	6.8	9.7	5.0	7.8	16.5	8.1	14.5

[1] Bt, CRW, GLY, LL, Lf traits contain genes for European corn borer tolerance, corn rootworm tolerance, and glyphosate, Liberty LinkR (glufosinate-ammonium) herbicide resistance, and leafy trait, respectively.

[2] DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture.

[3] Quality concentration expressed as a % of DM, except NDFD which is expressed as a % of NDF. Refer to Results Provided text for additional information.

[4] Milk production was estimated using spreadsheet MILK2006 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

Table 2. Relative maturity (RM), whole-plant moisture (Moist), dry matter (DM) and silage yield and quality traits for corn hybrids planted at Rochester (Olmsted County) in 2008.

Brand/ Hybrid Entry	Traits[1]	RM, Rating	Moist %	Yield, Ton/Acre [2] DM	Silage	Quality (Concentration), % [3] CP	NDF	IVD	NDFD	Starch	Milk Yield [4] Lb/ Ton	Lb/ Acre
Legacy Seeds/ L-5350 CBLLGT	Bt,GLY,LL	104	64.6	10.2	28.7	8.7	40	78	44	38	3,600	36,600
Producers Hybrids/ 7325VT3	Bt,CRW,GLY	113	69.9	10.1	33.6	9.1	42	77	45	33	3,530	35,700
Renk/ RK829VT3	Bt,CRW,GLY	112	67.5	9.7	29.8	8.9	43	76	44	33	3,460	33,600
Trelay/ 7T231	Bt,CRW,GLY	111	66.4	9.2	27.3	8.6	42	76	43	34	3,520	32,400
Legacy Seeds/ L-6600 HX	Bt,LL	110	69.4	9.7	31.7	8.9	45	74	42	31	3,320	32,300
Dairyland/ HiD.F.-3008-4	CRW,GLY	108	67.1	9.5	29.0	8.8	44	74	43	33	3,370	32,100
G2 Genetics/ 1X-716 HXT/LL	Bt,CRW,LL	116	68.4	9.2	29.0	9.6	42	77	44	34	3,510	32,100
Pioneer Brand/ 34A89	Bt,CRW,GLY,LL	110	65.7	9.3	27.1	9.0	43	75	43	32	3,440	31,900
Dekalb / DKC57-43	Bt,CRW,GLY	107	68.5	9.3	29.7	8.7	44	75	42	33	3,400	31,700
Midwest Seed Genetics/ 76485VT3	Bt,CRW,GLY	107	66.0	8.8	25.8	9.3	42	77	45	37	3,540	31,100
Crow's/ 2123VT3	Bt,CRW,GLY	101	66.5	9.0	26.7	8.6	43	75	43	36	3,460	31,000
Renk/ RK844VT3	Bt,CRW,GLY	112	67.9	8.8	27.4	9.5	42	77	45	35	3,529	30,900
Crow's/ 3848VT3	Bt,CRW,GLY	105	65.3	9.1	26.2	8.5	46	74	42	32	3,300	30,000
Dekalb / DKC55-82	GLY	105	68.6	9.0	28.6	8.7	46	74	43	32	3,340	30,000
Crow's/ 4354VT3	Bt,CRW,GLY	107	68.0	8.6	27.0	9.3	44	76	44	33	3,450	29,800
Dekalb / DKC61-69	Bt,CRW,GLY	111	67.8	8.9	27.5	8.8	45	74	43	31	3,360	29,800
G2 Genetics/ 1X-911 HXT/LL	Bt,CRW,LL	111	69.2	9.1	29.4	9.1	46	74	43	29	3,290	29,800
Dekalb / DKC52-59	Bt,CRW,GLY	102	63.3	8.6	23.4	8.3	42	76	43	36	3,440	29,500
Trelay/ 6T226	Bt,CRW,GLY	106	64.9	8.6	24.4	8.5	44	75	43	35	3,420	29,400
Crow's/ 1928R	GLY	99	65.1	8.2	23.4	8.8	40	77	43	37	3,550	29,000
Producers Hybrids/ 5634VT3	Bt,CRW,GLY	106	66.1	8.6	25.2	8.9	43	75	42	34	3,380	28,900
Crow's/ 4822B	Bt	107	67.5	9.0	27.7	8.8	47	73	42	28	3,190	28,700
Nu Tech Seed/ 0C-413 YGCB	Bt,CRW	113	66.1	8.3	24.5	8.6	44	75	43	32	3,380	28,100
Dekalb / DKC55-24	Bt,CRW,GLY	105	65.2	8.5	24.3	8.8	46	73	43	33	3,300	27,900
Fielders Choice/ NG 6720	Bt,CRW,GLY	108	66.4	8.4	25.0	8.6	46	73	41	34	3,290	27,600
Midwest Seed Genetics/ 76126VT3	Bt,CRW,GLY	105	64.1	8.2	22.9	8.2	45	74	42	33	3,350	27,600
Dairyland/ HiD.F.-3104		104	69.9	8.2	27.4	8.8	45	74	42	31	3,313	27,300
Renk/ RK692CBLLRW	Bt,CRW,LL	105	67.1	7.9	23.9	10.0	44	76	45	35	3,470	27,300
Dairyland/ HiD.F.-3130-6	GLY	110	71.1	8.5	29.4	8.8	48	73	43	25	3,190	27,100
Dekalb / DKC50-44	Bt,CRW,GLY	100	66.7	8.6	25.7	8.5	48	72	41	30	3,160	27,100
Fielders Choice/ NG 6686	Bt,CRW,GLY	107	66.4	8.7	25.8	8.3	49	71	41	29	3,130	27,100
Midwest Seed Genetics/ 76996VT3	Bt,CRW,GLY	109	62.8	8.1	21.9	8.2	45	74	43	33	3,330	27,100
Renk/ RK698RRYGRW	CRW,GLY	104	65.4	8.0	23.0	8.7	44	74	42	34	3,350	26,700
Renk/ RK770VT3	Bt,CRW,GLY	108	69.1	7.8	25.3	10.0	45	75	44	32	3,390	26,500
Mycogen/ TMF 2Q716	Bt,CRW,GLY	110	69.7	8.6	28.5	8.3	51	70	42	24	3,060	26,400

Table 2 (continued). Relative maturity (RM), whole-plant moisture (Moist), dry matter (DM) and silage yield and quality traits for corn hybrids planted at Rochester (Olmsted County) in 2008.

Brand/ Hybrid Entry	Traits[1]	RM, Rating	Moist %	Yield, Ton/Acre [2]		Quality (Concentration), % [3]					Milk Yield [4]	
				DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/ Ton	Lb/ Acre
Mycogen/ TMF 2W587	Bt,CRW	105	66.5	7.9	23.6	9.4	48	74	45	29	3,330	26,300
Jung Seed Genetics/ HDS 76V78		107	68.8	8.6	27.7	8.6	51	70	40	25	2,990	25,800
Jung Seed Genetics/ HDS 7105VT3	Bt,CRW,GLY	109	70.0	8.0	26.5	9.0	48	73	44	27	3,240	25,800
Nu Tech Seed/ 3T-310 VT3	Bt,CRW,GLY	110	66.0	7.8	22.9	8.4	45	74	42	31	3,300	25,700
Jung Seed Genetics/ HDS 66W46		104	66.5	8.2	24.5	8.2	48	71	40	29	3,080	25,300
Midwest Seed Genetics/ 76865VT3	Bt,CRW,GLY	109	68.3	7.6	24.1	8.9	45	74	42	31	3,310	25,300
Jung Seed Genetics/ HDS 7113QRR/YGP	Bt,CRW,GLY	113	70.4	7.6	25.6	8.7	46	73	43	28	3,260	24,700
Gold Country Seed/ 100-11 SSVT3	Bt,CRW,GLY,Lf	100	66.0	7.8	23.0	8.0	49	71	40	28	3,070	24,000
Gold Country Seed/ 98-11 SSRR	GLY,Lf	98	68.5	7.8	24.7	8.4	50	70	40	27	3,040	23,600
Midwest Seed Genetics/ 70006R	GLY	99	67.8	6.9	21.5	8.7	44	75	43	33	3,370	23,300
Dekalb / DKC53-17	Bt,CRW,GLY	103	66.0	7.3	21.5	8.7	49	72	42	30	3,140	23,000
Dekalb / DKC54-49	Bt,CRW,GLY	104	67.5	7.3	22.5	8.4	49	71	41	28	3,120	22,900
Mean			67.2	8.5	26.1	8.8	45	74	43	32	3,330	28,400
LSD(0.10)			2.4	1.3	4.1	0.5	4	3	2	5	260	5,400
CV			3.0	13.1	13.3	5.4	8.9	4.1	4.9	13.4	6.6	16.3

[1] Bt, CRW, GLY, LL, Lf traits contain genes for European corn borer tolerance, corn rootworm tolerance, and glyphosate, Liberty LinkR (glufosinate-ammonium) herbicide resistance, and leafy trait, respectively.

[2] DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture.

[3] Quality concentration expressed as a % of DM, except NDFD which is expressed as a % of NDF. Refer to Results Provided text for additional information.

[4] Milk production was estimated using spreadsheet MILK2006 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

Table 3. Relative maturity (RM), whole-plant moisture (Moist), dry matter (DM) and silage yield, and quality traits for corn hybrids planted at Paynesville (Stearns County) in 2008.

Brand/ Hybrid Entry	Traits[1]	RM, Rating	Moist %	Yield, Ton/Acre [2]		Quality (Concentration), % [3]					Milk Yield [4]	
				DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/ Ton	Lb/ Acre
Fielders Choice/ NG 6720	Bt,CRW,GLY	108	64.2	10.8	30.1	8.5	40	76	41	37	3,530	38,000
Dekalb / DKC55-24	Bt,CRW,GLY	105	65.4	10.1	29.3	9.0	42	76	44	35	3,530	35,700
Crow's/ 2155VT3	Bt,CRW,GLY	102	64.5	9.9	28.0	9.1	41	76	41	38	3,480	34,500
Pioneer Brand/ 35F40	Bt,GLY,LL	107	66.0	9.8	28.9	9.5	42	76	43	36	3,490	34,300
Hyland Seeds/ HL SR59	RR	101	68.8	9.9	31.7	9.1	44	74	42	32	3,390	33,600
Producers Hybrids/ 6634VT3	Bt,CRW,GLY	106	66.4	9.7	28.8	8.9	43	75	41	36	3,430	33,200
G2 Genetics/ 5H-501 RR/HX	Bt,GLY,LL	101	66.8	9.1	27.4	9.2	41	77	44	39	3,620	32,900
Hyland Seeds/ HL B337	Bt	105	68.6	9.3	29.7	9.3	41	76	42	36	3,500	32,700
Renk/ RK692CBLLRW	Bt,CRW,LL	105	65.6	9.3	26.9	9.1	41	76	43	36	3,510	32,500
NuTech Seed/ 3T-302 VT3	Bt,CRW,GLY	102	66.1	9.2	27.1	9.2	42	76	43	37	3,530	32,400
Dekalb / DKC50-44	Bt,CRW,GLY	100	64.8	9.4	26.6	8.3	43	75	41	36	3,430	32,100
Legacy Seeds/ L-5350 CBLLGT	Bt,GLY,LL	104	65.5	9.4	27.2	8.8	43	75	42	36	3,420	32,100
Jung Seed Genetics/ HDS 7105VT3	Bt,CRW,GLY	109	69.6	9.7	31.9	9.4	48	73	43	29	3,280	31,800
Pioneer Brand/ 34A89	Bt,CRW,GLY,LL	110	69.1	9.6	31.0	9.9	46	74	43	31	3,320	31,800
Dekalb / DKC54-49	Bt,CRW,GLY	104	67.7	9.4	28.9	9.0	45	74	42	34	3,370	31,600
Dekalb / DKC55-82	GLY	105	69.6	9.3	30.5	9.6	44	75	43	33	3,420	31,600
Midwest Seed Genetics/ 70505VT3	Bt,CRW,GLY	101	65.7	8.7	25.3	8.8	40	77	43	38	3,610	31,400
Hyland Seeds/ HL S067		103	67.5	9.5	29.2	9.1	46	73	40	31	3,280	31,100
Gold Country Seed/ 100-11 SSVT3	Bt,CRW,GLY,Lf	100	65.9	9.3	27.2	8.8	45	74	42	33	3,340	31,000
Trelay/ 6T226	Bt,CRW,GLY	106	66.0	9.2	26.9	8.7	46	73	42	33	3,370	30,800
NuTech Seed/ 3T-500A VT3	Bt,CRW,GLY	100	63.3	9.0	24.5	8.8	43	75	41	36	3,380	30,400
Hyland Seeds/ HL B49R	Bt,GLY	100	67.0	8.9	26.9	9.6	45	74	43	35	3,410	30,300
Crow's/ 1928R	GLY	99	65.6	9.0	26.2	9.4	45	74	42	35	3,350	30,100
Hyland Seeds/ HL CVR64	Bt,CRW,GLY	97	64.2	8.8	24.5	9.1	43	75	42	36	3,410	30,000
Midwest Seed Genetics/ 69305VT3	Bt,CRW,GLY	98	62.6	8.9	23.7	8.5	42	75	40	38	3,390	30,000
Dairyland/ HiD.F.-3000-6	GLY	100	67.1	8.9	27.0	9.1	46	74	43	32	3,340	29,700
Fielders Choice/ NG 6520	Bt,CRW,GLY	98	65.0	9.1	26.1	8.2	45	73	40	35	3,260	29,700
Dekalb / DKC52-59	Bt,CRW,GLY	102	65.1	9.1	26.2	8.6	45	73	39	36	3,230	29,600
Renk/ RK698RRYGRW	CRW,GLY	104	63.1	8.7	23.5	8.5	42	76	41	37	3,410	29,500
Dekalb / DKC50-19	Bt,CRW,GLY	100	64.8	8.3	23.6	8.9	42	76	44	38	3,520	29,200
Dekalb / DKC38-89	Bt,CRW,GLY	89	61.4	8.6	22.4	8.9	44	75	42	38	3,360	29,000
Jung Seed Genetics/ HDS 66W46		104	67.1	8.9	27.1	9.2	47	72	41	30	3,230	28,700
Mycogen/ TMF 2W587	Bt,CRW	105	67.1	8.1	24.5	9.9	43	77	45	34	3,550	28,600
Dekalb / DKC45-79	Bt,CRW,GLY	95	64.2	8.4	23.5	8.8	44	74	41	37	3,380	28,500
Fielders Choice/ NG 6686	Bt,CRW,GLY	107	67.3	8.5	25.9	9.2	46	74	44	32	3,360	28,500
Hyland Seeds/ HL SVT50	Bt,CRW,GLY	101	71.3	8.7	30.3	8.9	47	73	43	28	3,280	28,500
Jung Seed Genetics/ HDS 76V78		107	69.0	8.8	28.4	9.2	48	72	42	29	3,220	28,500

Table 3 (continued). Relative maturity (RM), whole-plant moisture (Moist), dry matter (DM) and silage yield, and quality traits for corn hybrids planted at Paynesville (Stearns County) in 2008.

		RM,	Moist	Yield, Ton/Acre [2]		Quality (Concentration), % [3]					Milk Yield [4]	
Brand/ Hybrid Entry	Traits[1]	Rating	%	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/ Ton	Lb/ Acre
Wensman Seed/ W 7143VT3	Bt,CRW,GLY	93	64.3	8.3	23.1	9.1	45	74	42	35	3,320	27,400
Dekalb / DKC41-60	Bt,CRW,GLY	91	61.6	8.5	22.2	8.4	46	73	41	35	3,200	27,300
Dekalb / DKC53-17	Bt,CRW,GLY	103	67.2	7.9	24.0	9.1	45	74	43	34	3,400	26,800
Renk/ RK632RRYGPL	Bt,CRW,GLY	102	65.2	8.7	24.9	8.4	49	71	40	29	3,080	26,700
Dekalb / DKC43-27	Bt,CRW,GLY	93	63.0	7.8	21.0	9.0	42	76	42	38	3,410	26,500
Producers Hybrids/ 5624VT3	Bt,CRW,GLY	96	60.7	8.0	20.4	8.6	43	74	41	39	3,300	26,500
Renk/ RK616VT3	Bt,CRW,GLY	102	65.0	8.2	23.5	8.4	47	72	40	33	3,220	26,500
Gold Country Seed/ 98-11 SSRR	GLY,Lf	98	67.3	8.4	25.7	8.4	48	71	39	30	3,150	26,400
Wensman Seed/ W 7107VT3	Bt,CRW,GLY	90	59.6	8.7	21.5	8.6	48	71	39	35	3,020	26,200
Dekalb / DKC48-46	Bt,CRW,GLY	98	62.5	8.6	22.9	7.9	47	71	38	30	3,030	26,000
Hyland Seeds/ HL S047		99	64.4	7.9	22.1	8.7	46	73	41	32	3,260	25,700
Trelay/ 6T672	Bt,CRW,GLY	107	67.1	8.1	24.7	8.3	48	71	39	30	3,150	25,600
Mycogen/ TMF 2N422	GLY	94	61.8	8.2	21.3	9.0	49	71	40	32	3,050	24,900
Jung Seed Genetics/ HDS 6098QVTRW/R	CRW,GLY	98	68.3	7.8	24.7	8.9	50	71	42	28	3,130	24,500
Mean			65.6	8.9	26.1	8.9	45	74	42	34	3,350	29,800
LSD(0.10)			2.7	1.2	3.2	0.7	4	3	2	5	250	5,200
CV			3.6	12.1	10.5	6.8	8.9	3.8	4.9	13.8	6.3	14.9

[1] CB, CRW, GLY, LL traits contain genes for European corn borer tolerance, corn rootworm tolerance, and glyphosate and Liberty Link R (glufosinate-ammonium) herbicide resistance, respectively.

[2] DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture.

[3] Quality concentration expressed as a % of DM, except NDFD which is expressed as a % of NDF. Refer to Results Provided text for additional information.

[4] Milk production was estimated using spreadsheet MILK2006 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

Table 4. Relative maturity (RM), whole-plant moisture (Moist), dry matter (DM) and silage yield, and quality traits for corn hybrids planted at Melrose (Stearns County) in 2008.

		RM,	Moist	Yield, Ton/Acre [2]		Quality (Concentration), % [3]					Milk Yield [4]	
Brand/ Hybrid Entry	Traits[1]	Rating	%	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/ Ton	Lb/ Acre
Dekalb / DKC55-24	Bt,CRW,GLY	105	66.6	9.2	27.6	9.2	42	76	44	39	3,610	33,300
Pioneer Brand/ 35F40	Bt,GLY,LL	107	66.4	8.7	25.8	9.7	42	77	44	40	3,590	31,100
Trelay/ 6T226	Bt,CRW,GLY	106	65.5	9.0	26.0	9.1	45	74	43	35	3,440	30,900
Gold Country Seed/ 98-11 SSRR	GLY,Lf	98	68.2	9.3	29.2	9.2	47	72	41	34	3,290	30,500
Pioneer Brand/ 34A89	Bt,CRW,GLY,LL	110	69.6	9.0	29.5	9.2	44	74	41	32	3,400	30,500
Dekalb / DKC50-19	Bt,CRW,GLY	100	67.0	8.6	26.0	9.8	45	75	45	38	3,530	30,400
Midwest Seed Genetics/ 70505VT3	Bt,CRW,GLY	101	67.0	8.8	26.8	9.3	44	74	42	36	3,440	30,400
Renk/ RK632RRYGPL	Bt,CRW,GLY	102	65.9	8.6	25.1	9.6	43	76	43	39	3,530	30,200
Fielders Choice/ NG 6686	Bt,CRW,GLY	107	65.5	8.6	24.8	8.8	44	75	44	34	3,510	30,000
Dairyland/ HiD.F.-3000-6	GLY	100	68.0	8.4	26.1	10.0	45	76	47	34	3,570	29,900
Jung Seed Genetics/ HDS 66W46		104	68.1	9.0	28.4	9.5	47	72	41	34	3,260	29,500
Legacy Seeds/ L-5350 CBLLGT	Bt,GLY,LL	104	68.4	9.0	28.5	9.4	47	72	40	34	3,270	29,500
Crow's/ 2155VT3	Bt,CRW,GLY	102	66.3	8.9	26.3	9.2	47	72	41	33	3,280	29,100
Renk/ RK698RRYGRW	CRW,GLY	104	63.8	8.5	23.5	9.3	43	75	41	39	3,410	29,100
Jung Seed Genetics/ HDS 6098QVTRW/R	CRW,GLY	98	66.8	8.7	26.1	8.9	45	73	40	35	3,340	29,000
Dekalb / DKC43-27	Bt,CRW,GLY	93	63.6	8.5	23.4	9.4	44	74	41	40	3,370	28,700
G2 Genetics/ 5H-501 RR/HX	Bt,GLY,LL	101	67.3	8.1	24.8	9.2	42	76	43	37	3,530	28,700
Gold Country Seed/ 100-11 SSVT3	Bt,CRW,GLY,Lf	100	66.9	8.8	26.6	8.7	46	72	40	32	3,260	28,700
Dekalb / DKC55-82	GLY	105	70.0	8.6	29.4	9.2	48	72	41	31	3,230	28,600
Dekalb / DKC52-59	Bt,CRW,GLY	102	67.5	8.4	25.8	9.1	44	74	41	38	3,410	28,500
Mycogen/ TMF 2W587	Bt,CRW	105	68.1	8.4	26.4	9.0	46	74	42	32	3,380	28,400
Dekalb / DKC48-46	Bt,CRW,GLY	98	65.7	8.7	25.5	8.7	48	71	40	34	3,230	28,200
Crow's/ 1928R	GLY	99	68.1	8.4	26.4	9.6	46	73	41	35	3,320	27,900
Dekalb / DKC50-44	Bt,CRW,GLY	100	68.3	8.3	26.2	8.9	45	73	41	34	3,370	27,900
Dekalb / DKC54-49	Bt,CRW,GLY	104	69.2	8.2	26.7	9.0	46	73	41	33	3,340	27,500
Producers Hybrids/ 5624VT3	Bt,CRW,GLY	96	67.1	8.0	24.4	8.4	45	74	42	37	3,400	27,300
Mycogen/ TMF 2N422	GLY	94	65.3	8.3	24.0	9.6	49	72	42	34	3,260	27,100
Dekalb / DKC38-89	Bt,CRW,GLY	89	66.7	8.5	25.5	9.1	49	71	41	31	3,170	27,000
Fielders Choice/ NG 6520	Bt,CRW,GLY	98	66.7	8.0	24.1	8.8	45	73	40	37	3,320	26,600
Renk/ RK692CBLLRW	Bt,CRW,LL	105	68.3	7.5	23.6	9.7	43	76	45	37	3,550	26,500
Dekalb / DKC53-17	Bt,CRW,GLY	103	68.8	8.0	25.6	8.6	47	72	41	34	3,300	26,400
Hyland Seeds/ HL B49R	Bt,GLY	100	66.9	7.6	23.0	8.7	44	75	42	37	3,470	26,400

Table 4 (continued). Relative maturity (RM), whole-plant moisture (Moist), dry matter (DM) and silage yield, and quality traits for corn hybrids planted at Melrose (Stearns County) in 2008.

		RM,	Moist	Yield, Ton/Acre [2]		Quality (Concentration), % [3]					Milk Yield [4]	
Brand/ Hybrid Entry	Traits[1]	Rating	%	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/ Ton	Lb/ Acre
Dekalb / DKC45-79	Bt,CRW,GLY	95	67.2	7.5	22.7	9.0	43	75	42	38	3,510	26,200
Midwest Seed Genetics/ 69805VT3	Bt,CRW,GLY	98	67.9	7.9	24.5	9.4	46	73	41	34	3,330	26,200
Hyland Seeds/ HL CVR64	Bt,CRW,GLY	97	65.1	7.8	22.3	9.6	46	73	41	36	3,350	26,100
Jung Seed Genetics/ HDS 7105VT3	Bt,CRW,GLY	109	71.8	8.2	29.1	9.5	48	71	40	29	3,180	26,100
Dekalb / DKC41-60	Bt,CRW,GLY	91	64.0	7.7	21.5	9.0	46	72	40	37	3,320	25,700
Hyland Seeds/ HL SR59	RR	101	70.7	7.9	26.8	8.6	46	72	41	29	3,260	25,700
Renk/ RK616VT3	Bt,CRW,GLY	102	66.9	7.5	22.8	9.8	45	74	42	37	3,380	25,500
NuTech Seed/ 3T-500A VT3	Bt,CRW,GLY	100	67.5	8.0	24.6	8.7	49	71	40	32	3,180	25,400
Wensman Seed/ W 7107VT3	Bt,CRW,GLY	90	63.4	7.7	21.1	9.4	45	74	41	36	3,280	25,400
Hyland Seeds/ HL S067		103	69.7	8.4	27.6	8.4	51	68	38	26	2,980	24,900
Producers Hybrids/ 6634VT3	Bt,CRW,GLY	106	68.5	7.7	24.6	8.6	46	72	39	32	3,190	24,600
NuTech Seed/ 3T-302 VT3	Bt,CRW,GLY	102	68.9	7.1	22.7	8.8	44	75	44	32	3,450	24,400
Trelay/ 6T672	Bt,CRW,GLY	107	67.1	7.4	22.4	8.5	45	72	38	33	3,230	23,900
Hyland Seeds/ HL B337	Bt	105	71.5	7.3	25.6	10.0	48	72	42	29	3,240	23,600
Jung Seed Genetics/ HDS 76V78		107	70.3	7.3	24.7	8.5	48	70	39	27	3,100	22,700
Wensman Seed/ W 7143VT3	Bt,CRW,GLY	93	66.2	6.5	19.3	9.4	43	75	42	37	3,460	22,600
Hyland Seeds/ HL SVT50	Bt,CRW,GLY	101	71.0	7.0	24.1	9.1	48	72	41	28	3,200	22,400
Hyland Seeds/ HL S047		99	66.4	7.3	21.6	9.3	52	69	40	30	3,080	22,300
Fielders Choice/ NG 6720	Bt,CRW,GLY	108	69.6	6.8	22.3	8.7	49	70	38	28	3,060	20,800
Mean			67.5	8.2	25.1	9.1	46	73	41	34	3,340	27,200
LSD(0.10)			2.3	1.2	4.0	ns	4	3	3	5	230	4,900
CV			2.9	13.1	13.6	8.3	8.5	3.9	6.4	12.8	6.0	15.5

[1] CB, CRW, GLY, LL traits contain genes for European corn borer tolerance, corn rootworm tolerance, and glyphosate and Liberty Link R (glufosinate-ammonium) herbicide resistance, respectively.

[2] DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture.

[3] Quality concentration expressed as a % of DM, except NDFD which is expressed as a % of NDF. Refer to Results Provided text for additional information.

[4] Milk production was estimated using spreadsheet MILK2006 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

Table 5. Relative maturity (RM), whole-plant moisture (Moist), dry matter (DM) and silage yield and quality traits for corn hybrids planted at Ottertail (Otter Tail County) in 2008.

		RM,	Moist	Yield, Ton/Acre [2]		Quality (Concentration), % [3]					Milk Yield [4]	
Brand/ Hybrid Entry	Traits[1]	Rating	%	DM	Silage	CP	NDF	IVD	NDFD	Starch	Lb/ Ton	Lb/ Acre
Dekalb / DKC50-42	Bt,CRW,GLY	100	69.0	7.7	25.0	9.2	42	79	51	31	3,310	25,700
Pioneer Brand/ 38P43	Bt,CRW,GLY,LL	94	66.1	7.8	23.0	8.5	43	77	47	31	3,180	24,700
Pioneer Brand/ 37N16	Bt,CRW,GLY,LL	97	69.2	7.6	24.6	8.7	45	76	46	30	3,070	23,300
Elite/ MATRIX		98	71.0	7.7	26.4	8.1	44	76	46	26	2,990	23,000
Hyland Seeds/ HL SR35	GLY,Lf	89	68.1	7.0	22.1	9.2	45	76	47	32	3,110	21,900
Crop Production Service/ V3640		94	66.7	7.4	22.2	8.2	46	74	44	28	2,960	21,900
Dekalb / DKC45-79	Bt,CRW,GLY	95	68.9	7.9	25.3	8.6	51	72	45	25	2,760	21,700
Pioneer Brand/ 35F37	GLY	107	64.4	7.0	19.7	8.8	46	76	47	32	3,060	21,500
Dekalb / DKC42-91	Bt,CRW,GLY	92	68.5	7.0	22.1	8.6	45	76	47	29	3,070	21,400
NuTech Seed/ 3U-997	CRW,GLY,Lf	97	66.9	7.0	21.1	9.4	48	75	48	28	3,000	21,000
Hyland Seeds/ HL S038	Bt,GLY	89	69.8	6.7	22.0	9.4	45	76	48	29	3,080	20,500
Dairyland/ HiDF-3094-6	GLY	94	71.3	7.5	26.2	8.1	48	72	42	22	2,690	20,200
NuTech Seed/ 3A-306	GLY,Lf	106	65.9	6.8	20.0	8.8	47	74	44	28	2,930	20,000
Dairyland/ HiDF-3098		98	68.2	6.7	21.1	8.7	46	75	45	26	2,970	19,900
Hyland Seeds/ HL SR42	GLY,Lf	95	67.9	6.9	21.6	8.8	50	71	43	25	2,730	18,900
NuTech Seed/ 5H-298	Bt,CRW,GLY	96	69.3	6.5	21.2	8.9	49	74	46	26	2,920	18,900
Mean			68.2	7.2	22.7	8.8	46	75	46	28	2,990	21,500
LSD(0.10)			1.4	0.5	1.5	0.6	2	2	2	3	180	2,100
CV			1.5	5.2	4.8	5.1	4.5	1.9	3.9	8.0	4.3	6.9

[1] CB, CRW, GLY, LL traits contain genes for European corn borer tolerance, corn rootworm tolerance, and glyphosate and Liberty Link R (glufosinate-ammonium) herbicide resistance, respectively. The LF trait denotes leafy silage.

[2] DM yield is whole-plant corn yield at 100% dry matter; Silage yield is whole-plant corn yield at harvest moisture.

[3] Quality concentration expressed as a % of DM, except NDFD which is expressed as a % of NDF. Refer to Results Provided text for additional information.

[4] Milk production was estimated using spreadsheet MILK2006 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

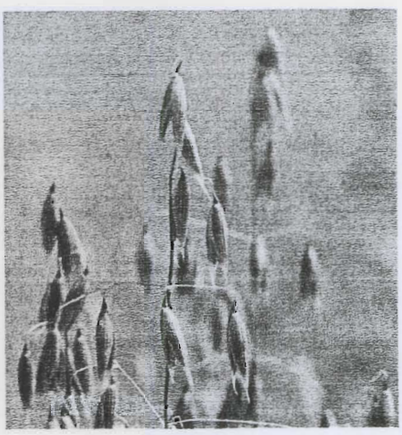
Minnesota Agricultural Experiment Station
UNIVERSITY OF MINNESOTA

Varietal Trials Results

January 2009

Oat

Deon Stuthman and Roger Caspers



Proper selection of oat varieties requires consideration of the anticipated growing conditions, the pests that might be encountered in a specific production situation, the purpose for growing the crop and its eventual usage. Specific growing situations will dictate the priority and emphasis given to each trait included in the tables. While crown rust usually is the most important disease, in 2008 there was little crown rust in the state except in the southeast quarter because the weather elsewhere in mid-2008 was not favorable for rust infection in spite of ample inoculum and many susceptible varieties in production.

A detailed interpretation of our crown rust data follows. Because of several changes in rust races in recent years, many of the varieties currently grown are now susceptible to crown rust. In the disease data table, the crown rust rating is a combination of the quantity of pustules and their relative size. The scores range from susceptible to moderately susceptible. Three varieties, Souris, Stallion and Beach, are less likely to suffer severe damage than the other seven varieties in the table.

Treated seed should be used for smut-susceptible varieties, and those with BYDV (red leaf) susceptibility (score of 6.0 or higher) should be chosen carefully.

Earlier varieties may perform relatively better in more southerly parts of the state; later varieties usually have an advantage in the north. Taller varieties generally tend to produce more forage and/or straw. Lodging can be site-specific; varieties with lodging scores above 2.0 should be chosen cautiously, especially if your soil is highly fertile. Groat percent is an important consideration for grain production, perhaps equal to grain yield, whether the crop is intended for food or feed. This year we have again added the calculated trait, groat yield, a combination of bushels per acre and groat percent.

Descriptions of oat varieties covered by the U.S. Plant Variety Protection Act include a PVP designation. When PVP is followed by the notation (94), seed of that variety may not be sold by a grower, not even to a relative or neighbor, without the expressed permission of the variety's developer/owner. If the PVP designation is followed by (pending), consider the variety as having PVP (94) protection.

General-Purpose Varieties

Many of these varieties have been tested three years or more; they usually are not grown for a specific special purpose.

Baker — Medium maturity, average yield, medium height, fair lodging resistance, average test weight, fair groat percentage. Ivory-white seed. Susceptible to crown rust, resistant to smut and tolerant to red leaf. Selected at Iowa AES. Released in 2006.

Beach — Late maturity, high yield, taller, medium lodging resistance, above average test weight and groat percentage. Some resistance to crown rust, moderately resistant to smut, susceptible to red leaf. Ivory-white seed. Selected at N.D. AES. Released in 2006. **PVP (94)**

Buckskin — Medium maturity, high yield, average height, good lodging resistance, good test weight, average groat percent. Susceptible to crown rust and smut, tolerant to red leaf. White seed. Released at Ill. AES in 2007. **PVP (94)**

Esker — Early-medium maturity, average yield and height, fair lodging resistance, below average test weight, better groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Wis. AES. Released in 2003. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

Oat traits, 2006-2008.

Variety	Days After Planting To Heading	Height, Inches	Lodging, 1 = Erect 5 = Flat	Test Weight, Lb/Bu	Groat %	Groat Yield, Bu/Acre
Baker	61	32	2.0	41.3	69.3	73.2
Beach	64	36	1.8	42.9	71.4	78.2
Buckskin	61	32	1.9	42.6	70.1	78.9
Esker	59	32	2.1	40.5	71.7	78.1
Excel[1]	59	31	2.0	40.0	67.8	77.6
Kame	58	30	1.9	38.8	70.7	72.1
Morton	64	36	2.0	40.6	69.4	70.8
Souris[1]	63	31	1.7	42.1	72.7	78.9
Stallion	63	36	2.4	41.9	70.5	79.9
Winona	57	31	1.9	41.0	71.6	66.7
Average	61	33	2.0	41.2	70.5	75.5

[1] 2-year data adjusted for 3 years.

Oat yield, percent of mean, by location, 2006-2008.

Variety	Rosemount	Waseca	Lamberton	Morris[1]	Crookston	Average of 5 Locations
Baker	105	99	98	92	99	99
Beach	95	102	102	108	105	102
Buckskin	95	101	102	113	113	105
Esker	106	101	101	95	104	102
Excel[2]	106	108	109	111	103	107
Kame	94	96	101	92	93	95
Morton	88	104	96	90	98	95
Souris[2]	105	105	95	96	105	101
Stallion	108	106	109	111	98	106
Winona	98	79	88	91	82	87
Location mean (bu/acre).	93	90	108	127	123	107
LSD 0.05 (% of mean).	7.1	8.9	8.3	9.1	6.2	3.5

[1] 2006-07 data only.
[2] 2-year data adjusted for 3 years.

Excel – Early-medium maturity, high yield, shorter, average lodging resistance, below average test weight and groat percentage. Yellow seed. Susceptible to crown rust and smut, very good tolerance to red leaf. Selected at Purdue AES. Released in 2007. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

HiFi – Late maturity, high yield, tall, good lodging resistance, high test weight, medium groat percentage. White seed. Resistant to crown rust, moderately susceptible to smut, some tolerance to red leaf. Selected at N.D. AES. Released in 2001. **PVP (94)**

Kame – Early maturity, below average yield, short, good lodging resistance, poor test weight, average groat percentage. Yellow seed. Susceptible to crown rust, moderately resistant to smut, susceptible to red leaf. Selected at Wis. AES. Released in 2004. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

Moraine – Medium maturity and yield, short, fair lodging resistance, good test weight, high groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Wis. AES. Released in 2001. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

Morton – Late maturity, below average yield, tall, average lodging resistance, below average test weight, fair groat percentage. Ivory seed. Susceptible to crown rust, resistant to smut, susceptible to red leaf. Selected at N.D. AES. Released in 2001. **PVP (94)**

Reeves – Early maturity, fair yield, medium height, poor lodging resistance, high test weight and groat percentage. Ivory seed. Susceptible to crown rust, moderately susceptible to smut, susceptible to red leaf. Selected at S.D. AES. Released in 2002.

Richard – Early-medium maturity, medium yield, tall, good lodging resistance, high test weight, medium groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Minn. AES. Released in 2000. **PVP (94)**

Riser – Early maturity, lower yield, short, fair lodging resistance, high test weight and groat percentage. Yellow seed. Some resistance to crown rust and smut, susceptible to red leaf. Selected at S.D. AES. Released in 1998.

Sesqui – Late maturity, lower yield, average height, fair lodging resistance, fair test weight, poor groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, good tolerance to red leaf. Selected at Minn. AES. Released in 2001.

Disease data in a single year, 2008.

Variety	Crown Rust (Buckthorn Nursery) Amount[1]	Crown Rust (Buckthorn Nursery) Reaction Type[2]	Smut Score[3]	BYDV Score[4]
Baker	>20	S	R	3.5
Beach	20	MS	MR	3
Buckskin	>20	S	S	3.5
Esker	>20	MS	R	4.5
Excel	>20	MS	S	1.5
Kame	>20	MS	MR	7
Morton	>20	S	R	6
Souris	10	MS	R	5
Stallion	20	MS	S	6.5
Winona	>20	S	MR	4

[1] Relative proportion of rust spores that will achieve a successful infection.
[2] R = resistant, MR = moderately resistant, MS = moderately susceptible and S = susceptible.
[3] Artificially innoculated, R = resistant, MR = moderately resistant, MS = moderately susceptible and S = susceptible.
[4] Barley yellow dwarf virus score from Urbana, Ill., with 1 = no symptoms and 9 = dead.

Oat yield (percent of mean), off-station locations, 2008 only.

Variety	Stephen
Baker	108
Beach	100
Buckskin	95
Esker	105
Excel	103
Kame	76
Morton	103
Souris	110
Stallion	103
Winona	97
Location mean (bu/acre).	148
LSD 0.05 (% of mean).	5.4

Souris — Medium-late maturity, medium yield, shorter, very good lodging resistance, good test weight, very good groat percentage. Ivory-white seed. Some resistance to crown rust. Resistant to smut and susceptible to red leaf. Selected at North Dakota AES. Released in 2006. **PVP (94)**

Spurs — Early-medium maturity, good yield, short with good lodging resistance. Good test weight, average groat percentage. Ivory-white seed. Susceptible to crown rust, smut, and red leaf. Released by Ill. AES in 2005. **PVP (94)**

Stallion — Late maturity, high yield, tall with poor lodging resistance. Good test weight, average groat percentage. White seed. Some resistance to crown rust, susceptible to smut and red leaf. Released by S.D. AES in 2006. **PVP (94)**

Wabasha — Medium maturity and height; lower yield, fair lodging resistance and test weight, high groat percentage. White seed. Susceptible to crown rust, resistant to smut and tolerant to red leaf. Selected at Minn. AES. Released in 2001.

Winona — Early, low yield, short, average lodging resistance, average test weight, good groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut and red leaf. Selected at Minn. AES. Released in 2005.

Special-Purpose Variety

This variety has also been tested three years or more, and has special attributes that differentiate it from general-purpose varieties or is intended for a specific end use.

Buff — Hulless. Medium maturity, good yield for hulless variety. Medium height, good lodging resistance, very high test weight. Susceptible to crown rust, resistant to smut, susceptible to red leaf. Selected at S.D. AES. Released in 2002.

Test Plot Research

Test plot establishment and management were supervised by Tom Hoverstad, George Nelson, Steve Quiring and John Weirsma.

Oat
Planting Rate and Date

Bushel Weight, Pounds	32
Seeds/Pound	16,200
Planting Rate, Pounds/Acre	80
Planting Rate, Seeds/Sq. Ft.	28
Planting Date	Early Spring

Wheat, Hard Red Spring

Jim Anderson, Jochum Wiersma, Gary Linkert, Catherine Springer and Susan Reynolds

Spring wheat varieties are compared in trial plots at Waseca, Lamberton, Morris, Crookston, Stephen, Roseau and St. Paul. Wheat varieties are grown in replicated plots at each location and plots are handled so that factors affecting yield and other characteristics are as nearly the same for all varieties at each location as possible.

These hard red spring wheat trials are not designed for crop (species) comparisons, because the various crops are grown on different fields or with different management. The data should only be used to compare varieties within a table.

Variety Selection Criteria

While grain yield is an important economic trait, return per acre also is affected by grain quality. Because Fusarium Head Blight (FHB), or scab, can reduce grain quality and yield dramatically, it is an important consideration. The foliar disease rating, which represents the total complex of leaf diseases other than leaf and stripe rust, includes the Septoria complex, tan spot, powdery mildew and bacterial blight. Although varieties may differ for their response to each of those diseases, the rating does not differentiate among them. Consequently, the rating should be used as a general indication and only for varietal selection in areas where these diseases have been a problem or if the previous crop was wheat or barley.

Control of fungal leaf diseases with fungicides may be warranted, even for varieties with an above-average rating. Disease ratings are now on a 1-9 scale where 1 = most resistant and 9 = most susceptible. Rating differences of 2 or more should be considered significant.

Variety selection for 2009 continues to be a balance between yield potential, disease responses and grain quality. Leading varieties in Minnesota, based on acres planted, include Knudson, Freyr, Glenn, Oklee, and Briggs. New releases for 2008 are Breaker (WestBred) and Tom (MAES). Albany is a 2008 release from Trigen.

Table 1. Origin and agronomic characteristics of hard red spring wheat varieties in Minnesota in single-year (2008) and multiple-year comparisons (2006-2008).

Variety	Origin[1]	PVP Status	Days to Heading[2]	Height Inches[2]	Straw Strength[3]
Ada	2006 MN	PVP (94)	62.3	31.1	4
Albany	2008 Trigen	Pending	65.1	30.6	5
Alsen	2000 NDSU	PVP (94)	61.7	32.9	4
Bigg Red	2004 WestBred	PVP (94)	62.6	35.1	6
Blade	2007 WestBred	PVP (94)	63.0	32.7	4
Breaker	2008 WestBred	Pending	62.6	32.5	3
Briggs	2002 SDSU	PVP (94)	60.3	32.5	7
Cromwell	2007 Thunder Seed	PVP (94)	63.6	32.3	5
Faller	2007 NDSU	PVP (94)	63.4	31.9	5
Freyr	2004 AgriPro	PVP (94)	63.0	32.9	6
Glenn	2005 NDSU	PVP (94)	60.6	34.2	4
Granger	2004 SDSU	PVP (94)	61.8	35.4	7
Hat Trick	2006 Trigen	PVP (94)	62.7	31.3	5
Howard	2006 NDSU	PVP (94)	61.9	34.2	7
Kelby	2006 AgriPro	PVP (94)	60.1	29.0	4
Knudson	2001 AgriPro	PVP (94)	62.7	31.1	5
Kuntz	2007 AgriPro	PVP (94)	63.0	30.1	4
Marshall	1982 MN	—	64.8	30.1	4
Oklee	2003 MN	PVP (94)	60.3	31.7	6
RB07	2007 MN	PVP (94)	60.5	31.6	5
Rush	2006 WestBred	PVP (94)	60.8	31.7	2
Samson	2007 WestBred	PVP (94)	62.8	29.6	2
Steele-ND	2004 NDSU	PVP (94)	62.0	34.1	7
Tom	2008 MN		61.9	32.9	7
Traverse	2006 SDSU	PVP (94)	60.3	34.6	6
Vantage	2007 WestBred	PVP (94)	66.3	32.1	2
Mean			62.3	32.2	

[1] Abbreviations: MN = Minnesota Agricultural Experiment Station, NPSAS/FBC = Northern Plains Sustainable Agriculture Society/Farmer Breeder Club, N. Star G. = North Star Genetics, NDSU = North Dakota State University Research Foundation, SDSU = South Dakota Agricultural Experiment Station, Trigen = Trigen Seed Services LLC.

[2] 2008 data.

[3] 1-9 scale in which 1 is the strongest straw and 9 is the weakest. Based on 2004-2008 data. The rating of newer entries may change by as much as one rating point as more data are collected.

Table 2. Grain quality of hard red spring wheat varieties in Minnesota in single-year (2008) and multiple-year comparisons (2007-2008).

Variety	Test Weight (Lb/Bu)		Protein (%)[1]		Baking Quality[2]	Pre-Harvest Sprouting[3]
	2008	2 yr.	2008	2 yr.		
Ada	61.9	61.7	14.1	14.2	Medium-High	2
Albany	59.7	59.9	13.7	13.7	—	4
Alsen	61.5	61.1	14.7	15.0	High	2
Bigg Red	63.2	62.5	14.0	13.7	Medium-Low	4
Blade	62.5	62.6	14.5	14.7	—	5
Breaker	62.7	—	14.3	—	—	—
Briggs	61.2	61.3	14.4	14.7	Medium	2
Cromwell	61.9	61.8	14.6	14.7	—	3
Faller	60.8	60.9	14.3	14.3	Medium	2
Freyr	60.0	60.0	14.2	14.3	Medium	2
Glenn	63.5	63.4	15.3	15.5	High	1
Granger	60.9	60.8	14.9	14.7	Medium	4
Hat Trick	62.0	61.6	14.0	14.0	Medium-Low	4
Howard	60.8	61.2	14.7	14.9	Medium-High	1
Kelby	61.4	61.2	14.6	14.7	Medium	1
Knudson	61.1	61.0	13.6	13.8	Medium-High	3
Kuntz	60.4	60.3	13.9	13.9	—	2
Marshall	58.4	57.8	13.6	13.5	Low	2
Oklee	62.0	61.4	15.0	14.9	Low-Medium	3
RB07	60.8	60.6	14.4	14.8	Medium-High	2
Rush	62.5	62.0	14.7	14.7	Medium-High	2
Samson	60.2	59.9	13.9	13.9	—	4
Steele-ND	61.5	61.5	14.8	15.0	High	2
Tom	61.2	61.0	14.2	14.3	Medium	1
Traverse	58.9	58.5	13.9	13.8	Low	4
Vantage	62.6	62.2	15.4	15.3	—	2
Mean	61.3	61.0	14.4	14.4		

[1] 12% moisture basis.
[2] 2003-2007 crop years.
[3] 1-9 scale in which 1 is best and 9 is worst. Values of 1-3 should be considered as resistant.

Leaf rust caused substantial damage across the trials on susceptible varieties in 2007 and again in Lamberton in 2008. Varieties with ratings of 5 or higher should be closely monitored during the season for rust development. Varieties with ratings of 4 or better should not experience economic levels of damage in most years.

Stripe rust was a serious problem on susceptible varieties in some locations in 2004. This disease is not as widespread and does not occur as regularly as leaf rust, but can be very damaging when temperatures remain unseasonably cool into early July. Most varieties are resistant or moderately resistant.

Stem rust ratings are included in the disease tables because there are differences in variety reaction. However, the levels of this disease have been very low in production fields in recent years, even on susceptible varieties.

Table 3. Disease reactions[1] of hard red spring wheat varieties in Minnesota in multiple-year comparisons (2006-2008).

Variety	Leaf Rust	Stripe Rust	Stem Rust[2]	Leaf Diseases[3]	Scab
Ada	5	1	2	5[4]	6
Albany	3	—	3	5	4
Alsen	5	1	1	6	4
Bigg Red	8	—	2	7	3
Blade	2	—	2	3	4
Breaker	2	—	2	3	—
Briggs	1	1	2	5	5
Cromwell	4	—	1	4	4
Faller	1	—	1	3	4
Freyr	4	1	4	4	4
Glenn	1	1	1	4	3
Granger	3	1	1	4	5
Hat Trick	5	—	4	5[4]	4
Howard	1	—	1	4	6
Kelby	3	—	1	4	5
Knudson	2	3	3	3	6
Kuntz	3	—	1	4	6
Marshall	8	1	1	7	7
Oklee	4	1	1	5	5
RB07	1	1	1	5	5
Rush	5	—	4	5	5
Samson	5	—	1	6	7
Steele-ND	1	1	1	4	6
Tom	4	—	1	5	4
Traverse	5	—	2	5	5
Vantage	5	—	3	6	5

[1] 1-9 scale where 1 = most resistant, 9 = most susceptible.
[2] Stem rust levels have been very low in production fields in recent years, even on susceptible varieties.
[3] Includes tan spot, septoria, bacterial leaf blight and powdery mildew.
[4] These varieties are more susceptible to powdery mildew.

Due to the increased use of fungicides on wheat in Minnesota, we initiated an additional variety trial in 2004 in which fungicides are applied at the time of herbicide application (Feekes 5), flag leaf emergence (Feekes 9), and at the onset of flowering (Feekes 10.51). The practice of three fungicide applications during the growing season is not recommended. This fungicide regime was implemented to measure the performance of varieties when fungal diseases were controlled to the maximum extent possible. A grower's decisions regarding fungicide applications should be based on the available decision support systems, and only if and when disease levels are forecasted to reach economic damaging levels.

The additional performance evaluations were carried out adjacent to the conventional (no fungicides applied) trials, so results can be compared directly. The trials were conducted in Lamberton, Crookston and Roseau in 2008. The fungicide regime as applied in these 2008 trials increased grain yield on average by more than 4 bu/acre, compared to about 9 bu/acre in 2007. The 3-year comparisons showed an increase in grain yield of about 5 bu/acre. Rather than the average increases in grain yield, the responses of individual varieties provide the most useful information; varieties rated susceptible to leaf rust and other leaf diseases benefited most from fungicide applications.

Hard red spring wheat planting rate and date.

Calculating and seeding the appropriate amount of seed is an important first step towards maximizing yield. The seeding rate is a function of the number of kernels per pound of seed, the percent germination of the lot, the expected stand loss as a function of the quality of the seedbed, and the desired stand. In Minnesota, an average optimum stand for hard red spring wheat when planted early is between 28 to 30 plants per square foot or approximately 1.25 million plants per acre. This number should increase by 1 to 2 plants per square foot for every week planting is delayed past the early, optimum, seeding date. Expected stand loss even under good seedbed conditions is between 10% to 20% and will increase with a poor seedbed or improper seed placement due to poor depth control.

The general formula for calculating a seeding rate is:

$$\text{Seeding Rate (Pounds/Acre)} = \frac{\text{Desired Stand (Plants/Acre)} \div (1 - \text{Expected Stand Loss})}{\text{(Seeds/Pound)} \times \text{Percentage Germination}}$$

Calculate the seeding rate for every single seed lot and calibrate the drill accordingly.

Example: Early variety.

Desired Stand, (Plants/Acre)	Expected Stand Loss	Seeds per Pound	Percentage Germination	Seeding Rate, (Lb/Acre)
1.25 million	0.20	14,000	0.95	117

Table 4. Relative grain yield, percent of the mean, of hard red spring wheat varieties in northern Minnesota locations in single-year (2008) and multiple-year comparisons (2006-2008).

	Crookston			Roseau			Stephen			On-Farm (5 Locations)		
Variety	2008	2-Year	3-Year	2008	2-Year	3-Year	2008	2-Year	3-Year	Average	2-Year	3-Year
Ada	99	97	97	93	98	98	99	98	94	99	100	99
Albany	112	121	—	94	96	—	88	105	—	112	—	—
Alsen	95	92	93	91	85	92	87	88	91	96	94	95
Bigg Red	92	92	93	105	89	94	88	90	91	96	91	93
Blade	101	101	—	101	104	—	93	100	—	99	103	—
Breaker	102	—	—	104	—	—	106	—	—	101	—	—
Briggs	96	100	105	97	112	108	87	94	98	98	101	104
Cromwell	102	101	—	103	110	—	95	97		99	103	—
Falker	114	123	117	123	125	121	103	115	110	106	112	—
Freyr	105	107	104	95	99	99	95	98	98	99	103	101
Glenn	94	97	95	103	100	104	105	98	98	95	99	100
Granger	95	95	95	93	99	101	85	88	93	103	101	104
Hat Trick	100	97	97	104	96	94	100	108	98	100	103	100
Howard	98	99	103	103	105	107	95	102	103	98	—	—
Kelby	101	101	102	104	112	103	108	103	98	96	95	97
Knudson	100	104	106	98	103	104	100	106	106	104	108	108
Kuntz	106	109	—	105	100	—	107	103	—	102	107	—
Marshall	96	84	89	89	81	85	86	84	83	82	72	76
Oklee	94	95	95	105	104	99	103	99	97	100	99	101
RB07	106	108	108	94	90	91	112	109	112	102	105	105
Rush	88	89	88	99	103	96	103	98	99	93	95	94
Samson	110	112	—	112	111	—	108	112	—	104	108	—
Steele-ND	96	99	101	93	99	104	96	96	100	99	105	106
Tom	99	101	103	100	105	105	118	107	110	104	101	102
Traverse	103	107	108	110	115	115	118	115	116	104	111	111
Vantage	89	96	—	117	104	—	91	98	—	91	93	—
Mean (Bu/Acre)	97.5	88.2	83.9	67.6	59.2	65.5	79.3	74.4	73.2	90.8	80.6	74.7
LSD (0.05)	5.7	10.4	11.5	11.9	17.9	14.8	17.3	17.2	12.6	17.1	13.6	10.4

Table 5. Relative grain yield, percent of the mean, of hard red spring wheat varieties in southern Minnesota locations in single-year (2008) and multiple-year comparisons (2006-2008).

	Lamberton			Morris[1]	St. Paul			Waseca		
Variety	2008	2-Year	3-Year	2-Year	2008	2-Year	3-Year	2008	2-Year	3-Year
Ada	85	95	100	99	74	77	86	104	82	87
Albany	83	112	—	—	105	100	—	123	114	—
Alsen	103	97	96	89	103	98	96	90	92	96
Bigg Red	111	102	101	99	99	100	98	92	99	98
Blade	106	108	—	—	101	103	—	96	100	—
Breaker	100	—	—	—	103	—	—	105	—	—
Briggs	100	111	110	108	110	110	107	83	92	95
Cromwell	88	87	—	—	99	99	—	90	90	—
Faller	104	119	117	115	87	97	102	93	106	105
Freyr	99	100	101	109	104	108	105	95	95	97
Glenn	92	98	95	82	100	101	95	88	95	92
Granger	129	124	120	105	99	99	98	76	100	102
Hat Trick	96	104	100	105	76	78	83	94	105	103
Howard	117	114	112	107	112	114	110	115	118	111
Kelby	99	100	96	84	121	127	119	97	106	103
Knudson	123	124	119	109	91	89	93	109	104	103
Kuntz	86	94	—	—	105	103	—	94	96	—
Marshall	59	61	67	83	74	73	82	65	56	69
Oklee	89	89	90	95	111	112	106	98	108	105
RB07	99	103	105	100	109	110	107	111	105	102
Rush	92	92	91	88	112	104	99	95	95	91
Samson	96	102	—	—	108	105	—	110	109	—
Steele-ND	100	107	106	111	104	109	105	118	119	111
Tom	101	98	95	91	105	107	106	86	90	91
Traverse	129	123	124	115	98	99	103	117	119	117
Vantage	93	96	—	—	100	90	—	100	95	—
Mean (Bu/Acre)	40.2	43.8	45.9	69.2	69.6	65.0	73.9	58.9	56.3	59.8
LSD (0.05)	23.8	22.3	14.2	17.1	9.6	12.4	13.8	23.3	21.6	17.0

[1] The Morris 2008 trial was abandoned due to herbicide drift damage. The 2-year data is from 2006-2007.

Table 6. Relative grain yield, percent of the mean, of hard red spring wheat varieties in Minnesota in single-year (2008) and multiple-year comparisons (2006-2008).

	State			North			South		
Variety	2008	2-Year	3-Year	2008	2-Year	3-Year	2008	2-Year	3-Year
Ada	93	93	94	97	98	96	84	86	91
Albany	102	108	—	99	108	—	106	109	—
Alsen	94	92	93	91	89	92	98	95	95
Bigg Red	96	95	96	94	90	92	99	99	99
Blade	99	102	—	98	102	—	100	103	—
Breaker	103	—	—	104	—	—	103	—	—
Briggs	95	103	104	93	102	104	98	104	104
Cromwell	97	98	—	100	103	—	93	93	—
Faller	105	114	112	113	121	116	93	106	107
Freyr	99	101	102	99	102	100	99	101	102
Glenn	98	97	95	100	98	99	94	96	92
Granger	95	101	101	91	94	96	100	107	106
Hat Trick	95	98	96	101	100	95	87	95	96
Howard	103	106	106	96	101	103	114	113	110
Kelby	105	107	102	104	105	101	107	109	103
Knudson	102	105	105	99	105	105	105	105	105
Kuntz	102	102	—	106	104	—	96	99	—
Marshall	81	75	81	91	83	86	67	65	74
Oklee	100	101	99	100	99	97	101	102	100
RB07	106	104	104	108	104	105	107	104	104
Rush	98	97	94	98	97	95	101	98	94
Samson	108	109	—	109	111	—	106	106	—
Steele-ND	100	104	105	95	98	101	108	110	108
Tom	102	102	101	106	105	106	97	98	96
Traverse	111	112	113	110	112	113	112	112	114
Vantage	98	96	—	97	98	—	98	95	—
Mean (Bu/Acre)	68.9	65	67.3	81.5	74.0	74.3	56.3	57.5	61.4
LSD (0.05)	9.1	6.9	5.3	10.1	8.1	6.7	15.6	11.3	8.0
No. Environments	6	13	20	3	6	9	3	7	11

Table 7. Grain yield (bu/acre) of hard red spring wheat varieties grown under conventional (Conv) and intensive (Int) management.

	North						South						State					
	2008		2-year		3-year		2008		2-year		3-year		2008		2-year		3-year	
Variety	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int	Conv	Int
Ada	79.4	82.9	70.4	79.7	70.9	81.8	34.0	46.2	51.8	57.0	53.9	59.1	64.3	70.6	62.4	69.9	63.2	71.5
Albany	85.0	89.4	—	—	—	—	33.4	48.6	—	—	—	—	67.8	75.8	—	—	—	—
Alsen	76.8	75.3	65.2	69.1	69.3	72.3	41.4	47.0	48.7	56.3	49.8	55.9	65.0	65.8	58.1	63.6	60.5	64.9
Bigg Red	81.2	80.7	67.2	74.7	—	—	44.5	50.8	51.8	63.4	—	—	69.0	70.8	60.6	69.8	—	—
Blade	83.4	83.8	74.1	74.8	—	—	42.8	43.3	54.5	58.5	—	—	69.9	70.3	65.7	67.8	—	—
Breaker	84.8	86.3	—	—	—	—	40.3	45.2	—	—	—	—	70.0	72.6	—	—	—	—
Briggs	79.7	83.0	74.9	80.0	78.1	83.2	40.1	45.3	56.8	59.2	58.3	60.1	66.5	70.4	67.1	71.1	69.1	72.7
Cromwell	84.6	88.9	76.0	81.0	—	—	35.2	39.8	47.4	51.1	—	—	68.1	72.5	63.7	68.2	—	—
Faller	98.0	100.1	89.5	91.7	—	—	41.9	46.6	62.0	64.6	—	—	79.3	82.2	77.7	80.1	—	—
Freyr	82.8	87.3	74.7	82.0	75.2	82.7	39.8	46.5	52.5	59.5	55.9	61.6	68.5	73.7	65.2	72.3	66.4	73.1
Glenn	81.3	85.4	71.7	76.5	74.2	75.5	36.9	39.7	47.8	52.3	47.6	51.3	66.5	70.1	61.5	66.1	62.1	64.5
Granger	77.5	81.6	69.7	74.5	72.2	76.1	51.8	52.9	61.4	64.9	60.8	65.5	68.9	72.0	66.1	70.4	67.0	71.3
Hat Trick	84.3	87.1	70.8	77.2	—	—	38.6	39.3	53.3	57.1	—	—	69.1	71.1	63.3	68.6	—	—
Howard	83.0	85.7	73.6	80.0	77.7	80.5	46.9	51.6	55.0	62.4	57.9	63.7	71.0	74.3	65.6	72.4	68.7	72.9
Kelby	84.7	82.0	76.4	78.0	75.1	77.4	39.8	54.1	50.5	57.5	48.6	55.9	69.7	72.7	65.3	69.2	63.0	67.6
Knudson	81.8	81.2	74.9	78.1	77.3	81.0	49.4	53.4	61.5	66.8	61.1	64.4	71.0	71.9	69.2	73.2	69.9	73.5
Kuntz	87.1	87.5	76.6	82.0	—	—	34.4	44.9	51.9	55.3	—	—	69.5	74.0	66.0	70.5	—	—
Marshall	76.6	83.0	60.8	80.4	65.3	82.0	23.8	41.8	33.7	54.7	39.4	56.8	59.0	69.3	49.2	69.3	53.5	70.5
Oklee	82.0	84.8	71.9	78.6	71.9	76.7	35.7	45.1	47.1	56.2	49.5	56.9	66.6	71.6	61.3	69.0	61.7	67.7
RB07	82.5	87.6	72.7	76.6	—	—	39.9	48.1	49.8	56.1	—	—	68.3	74.4	62.9	67.8	—	—
Rush	77.1	72.7	69.0	70.4	67.6	70.9	37.0	43.0	47.9	50.5	48.0	49.3	63.8	62.8	59.9	61.9	58.7	61.1
Samson	91.4	98.3	80.8	89.6	—	—	38.6	54.0	53.7	64.4	—	—	73.8	83.5	69.2	78.8	—	—
Steele-ND	77.7	83.6	71.2	77.2	75.6	80.6	40.3	45.6	55.2	57.2	57.8	57.5	65.2	70.9	64.4	68.6	67.5	70.1
Tom	82.3	87.1	—	—	—	—	40.6	43.8	—	—	—	—	68.4	72.6	—	—	—	—
Traverse	88.1	82.9	79.9	79.8	82.3	81.4	52.0	58.6	61.4	71.7	64.1	70.5	76.1	74.8	71.9	76.3	74.0	76.4
Vantage	85.1	89.3	73.2	78.9	—	—	37.5	49.6	49.9	61.3	—	—	69.2	76.1	63.2	71.4	—	—
Mean (Bu/Acre)	82.6	85.4	73.3	78.7	73.8	78.7	40.3	47.4	52.4	59.0	53.8	59.2	68.5	72.8	64.3	70.3	64.7	69.8
LSD (0.05)	10.5	9.2	7.5	7.7	6.2	6.3	9.6	7.0	6.8	8.2	5.5	5.9	8.6	7.2	5.4	6.1	4.3	4.5
No. Environments	2		4		6		1		3		5		3		7		11	

Minnesota Agricultural Experiment Station
UNIVERSITY OF MINNESOTA

Varietal Trials Results

January 2009

Wheat, Hard Red Winter

Jim Anderson, Jochum Wiersma, Gary Linkert, Catherine Springer and Susan Reynolds

Winter wheat varieties were compared in trial plots at Crookston, Lamberton, Roseau and St. Paul. A trial also was planted at Waseca, but there was too much winterkill at that location to provide meaningful yield data.

Wheat varieties are grown in replicated plots at each location. These plots are handled so that the factors affecting yield and other characteristics are as nearly the same for all varieties at each location as is possible. These winter wheat trials are not designed for crop (species) comparisons, because the various crops are grown on different fields or with different management. The data should be used only to compare varieties within a table.

Variety Selection Criteria

The success of a winter wheat variety depends largely on its ability to survive Minnesota winters. Research on the Canadian plains has shown that planting winter wheat in standing canola stubble using no-till methods can decrease winterkill considerably. Trapped snow provides additional protection that increases the odds that the young seedlings will survive.

Table 1. Growth characteristics of winter wheat varieties.

Variety	Origin [1]	PVP Status [2]	Heading, Days from Jan. 1 [3]	Height, Inches [3]	Winter-hardiness [4]	Lodging Rating	Test Weight, Lb/Bu		Protein % at 12% Moisture		Rust Resistance [5]	
							2008	2-Year	2008	2-Year	Leaf	Stem
Alice [6]	2006 SDSU	PVP (94)	163	28	M	M Strg	59.7	59.1	11.6	12.3	S	—
Arapahoe	1988 NE	PVP (94)	164	34	M	M Strg	59.4	59.4	11.7	12.6	MR	MR
CDC Buteo	2001 CAN	PVP (94)	167	34	MH	Strong	62.3	61.9	11.1	11.9	MS	—
CDC Falcon	1998 CAN	PVP (94)	166	30	MH	Strong	59.7	59.2	11.2	12.1	MS	R
Darrell	2006 SDSU	PVP (94)	165	33	M	M Strg	59.4	59.0	11.8	12.5	MS	—
Hawken	2008 AgriPro	PVP (94)	163	28	P	Strong	59.9	—	12.5	—	R	—
Jerry	2001 NDSU	none	167	37	H	M Strg	59.9	60.0	11.9	12.6	MR	R
Millennium	1999 NE	PVP (94)	165	35	M	Strong	60.2	60.3	11.7	12.7	MR	R
Overland	2007 NE	PVP (94)	164	32	M	Strong	60.0	59.9	12.1	12.9	MR	—
Ransom	1998 NDSU	PVP (94)	167	38	MH	Med.	59.2	59.3	11.5	12.3	MR	MR
Roughrider	1975 NDSU	none	167	41	VH	Med.	60.1	60.3	11.6	12.3	S	R
Wendy [6]	2004 SDSU	PVP (94)	162	32	M	M Strg	60.2	59.9	12.0	12.7	S	—
Mean			164.9	33.4			60.0	59.8	11.7	12.4		

[1] Abbreviations: CAN = Crop Development Centre, Saskatoon, Canada; NDSU = North Dakota State University; NE = Nebraska Agricultural Experiment Station; SDSU = South Dakota Agricultural Experiment Station.

[2] PVP = plant variety protection. When the letters are followed by (94), seed of that variety may not be sold by a grower to anyone without express permission of the variety's developer/owner.

[3] 2008 St. Paul data

[4] Winterhardiness rating is a relative ranking that includes data from Minnesota, Nebraska, North Dakota and South Dakota: VH = very high, H = high, MH = moderately high, M = moderate, P = poor.

[5] R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible.

[6] White wheat.

While all winter wheat varieties should be considered susceptible to very susceptible to Fusarium Head Blight (FHB), they head earlier than spring wheat varieties and have a better chance of escaping damage from FHB. Most winter wheat varieties are also susceptible to very susceptible to the leaf diseases other than the rusts. Use of fungicides to control these diseases and/or suppress FHB may be warranted.

All varieties listed are standard hard red winter wheats with the exception of Alice and Wendy, which have white grain. Hawken, a 2008 AgriPro release, was added to the trial in 2008.

Test Plot Research

Test plot establishment and management were supervised by Jim Cameron, Derek Crompton, Matt Bickell, Steve Quiring and Donn Vellekson.

Hard Red Winter Wheat Planting Rate and Date

Bushel Weight (Pounds).....60

Seeds/Pound.....14,500

Pounds Rate/Acre.....75+

Seeds/Square Foot.....25

Planting Date.....Aug. 20 – Sept. 20

Table 2. Yield (percent of the mean) of winter wheat varieties.

	Crookston		Lamberton			Roseau			St Paul			State		
Variety	2008	2-Year[1]	2008	2-Year	3-Year	2008	2-Year	3-Year	2008	2-Year	3-Year	2008	2-Year	3-Year
Alice	78	—	51	—	—	104	96	—	112	93	—	87	—	—
Arapahoe	104	104	108	112	107	102	106	102	92	101	100	101	106	103
CDC Buteo	135	119	101	99	105	106	104	102	94	96	90	109	100	103
CDC Falcon	114	109	126	114	103	103	96	100	106	109	109	112	106	105
Darrell	77	84	109	107	100	105	87	93	102	101	102	98	98	96
Hawken	82	—	84	—	—	112	—	—	114	—	—	98	—	—
Jerry	127	108	124	116	117	105	127	118	91	102	103	112	115	112
Millennium	104	96	116	114	109	111	103	104	96	95	90	107	104	100
Overland	97	—	111	117	—	101	103	—	106	87	—	103	—	—
Ransom	123	111	101	110	105	85	95	96	101	103	102	102	102	103
Roughrider	98	98	101	97	92	77	84	85	75	88	88	88	90	90
Wendy	106	95	84	84	79	101	100	101	99	108	107	98	97	96
Mean (Bu/A)	67.8	88.6	53.7	60.8	60.4	98.1	75.3	91.9	72.6	82.5	87.4	72.7	73.0	81.3
LSD	39.0	20.8	17.3	19.0	22.0	16.0	30.4	16.2	14.7	31.4	12.3	20.6	14.0	9.1

[1] Crookston 2-year data are 2006 and 2008. The 2007 Crookston location was abandoned due to winterkill.

Wildrice

Raymie Porter

Cultivated wildrice is grown on about 20,000 acres in Minnesota. Though some wildrice paddies are grown with shattering types, most growers use varieties with nonshattering tendencies.

For flexibility in harvesting, plant varieties resistant to shattering, disease and lodging. Where early killing frost is common, growers should favor varieties of early to medium maturity.

Varieties

Dawn SR – Very early maturing non-shattering variety derived from K2. Apparently fixed for nonshattering. Seeds longer than Itasca by at least 1/64 inch. Approximately 95% of A-width kernels are long-grain. Medium height, with a variety of panicle types. Not resistant to foliar diseases when population density is high. Moderate lodging resistance. Heading date at least two weeks earlier than Itasca. Released 2008 by Minn. AES under licensing agreement.

Itasca – High-yielding, tall, medium-late-maturing variety with superior resistance to seed shattering and fungal brown spot (FBS) disease. Very lodging resistant. Yield is about 50% higher than Petrowske Purple and Franklin.

Shattering loss is about one-third less than Franklin or Petrowske Purple. Significantly more FBS-resistant than Franklin. Taller than Franklin by 3 inches and Petrowske Purple by 4 inches.

Slightly later maturing that Petrowske Purple. Flowers 2 to 3 days after Petrowske Purple or Franklin. Average seed length is somewhat short, similar to Petrowske Purple and GIB-C9, but shorter than Franklin by 1/64 inch.

Panicle type is mixed, including a noticeable percentage of bottlebrush panicles, but declining from 50% frequency without continued selection for the trait.

Released 2002 exclusively to Minnesota growers by the Minnesota Cultivated Wild Rice Council.

Itasca Cycle-12 – Selected from Itasca as a high-yielding, medium-late maturing, long-grain variety with superior resistance to seed shattering, fungal brown spot (FBS) disease and lodging.

Wildrice Planting Rate and Date

Bushel Weight, Pounds	25
Seeds/Pound	7,900
Planting Rate, Pounds/Acre	35
Planting Rate, Seeds/Sq.Ft.	6
Planting Date	Late Fall

Yield, shattering and lodging ratings for wildrice varieties.

	Grand Rapids			Clearbrook/Gonvick			Aitkin			2008 Average		
Variety	Yield, Lb/Acre	Shattering %	Lodging Score	Yield, Lb/Acre	Shattering %	Lodging Score	Yield, Lb/Acre	Shattering %	Lodging Score	Yield, Lb/Acre[1]	Shattering %[2]	Lodging Score[3]
Dawn SR[4]	1,816	2	1.8	1,610	7	1.5	1,722	6	1.0	1,716	5	1.4
Itasca	3,140	4	1.8	3,065	1	1.5	3,105	4	1.0	3,103	3	1.4
Itasca Cycle-12	2,793	6	2.0	2,407	1	1.8	3,161	4	1.3	2,787	4	1.7
LSD 5%	627	4	0.7	676	2	0.8	573	3	0.3	357	2	0.4

[1] Adjusted to 40% moisture.
[2] Expressed as a percentage of shattered seed plus grain yield per unit area.
[3] Using a 1-5 scale where 1 = stems completely erect, 3 = stems averaging 45° angle, 5 = stems prostrate.
[4] Dawn SR suffered disproportionately high bird damage at Clearbrook because of its early maturity. Bird damage ratings averaged 68% for Dawn SR, 15% for Itasca, and 18% for Itasca Cycle-12.

Seeds 3/64" longer than Itasca, with a substantially higher percentage of long-grain seeds (>20/64") than Itasca. Equivalent to Itasca in yield, shattering resistance, FBS resistance, lodging resistance and maturity.

Panicle type is mixed, including a noticeable percentage of bottlebrush panicles, but declining from 50% frequency without continued selection for the trait.

Released 2007 exclusively to Minnesota growers by the Minnesota Cultivated Wild Rice Council.

Test Plot Research

Test plot establishment and management were supervised by Dan Braaten, Jacques Duquette and Henry Schumer.

Seed length and percent long in A-grade.

	Kelliher/Waskish		Clearbrook/Gonvick		Aitkin		2000-06 Average	
Variety	Seed Length, 64ths in.	Long in A-grade, %	Seed Length, 64ths in.	Long in A-grade, %	Seed Length, 64ths in.	Long in A-grade, %	Seed Length, 64ths in.[1]	Long in A-grade, %[2]
Dawn SR	—	—	—	—	—	—	—	—
Itasca	21.7	82	22.8	91	22.1	81	22.2	84
Itasca Cycle-12	—	—	—	—	24.9	96	—	—
LSD 5%	0.4	5	0.6	5	0.9	5	0.4	3
Years Represented	00-01-02	00-01-02	00-03	00-03	05-06	05-06	—	—

[1] Dried, hulled, intact seeds.

[2] Percentage of A-grade seeds (width >3.75/64 in.) that are in the long-grain length category (>20/64 in.), calculated on an estimated volume basis.

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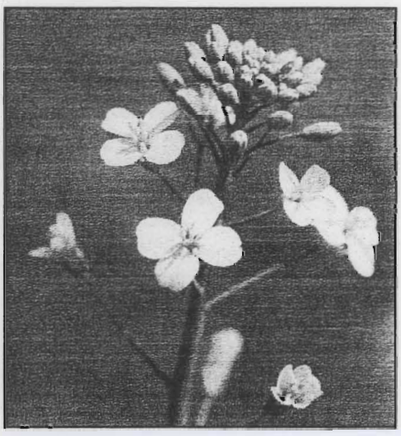
Varietal Trials Results

January 2009

Canola

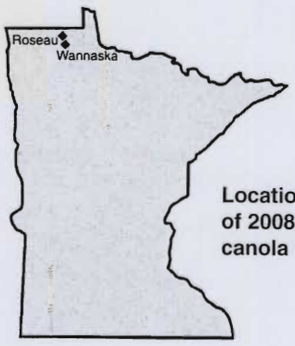
Paul Porter and Derek Crompton



Canola (*Brassica napus and B. rapa*) is a crop developed from oilseed rape by Canadian plant breeders; the first canola variety was licensed in 1974. Canola is used for edible oil extraction and protein feed meal. Canola oil is considered one of the highest quality edible oils available. Considerable acreage of spring canola is grown in Canada. Minnesota acreage increased from about 8,000 acres in 1990 to more than 200,000 acres in 1998. Acreage in recent years has declined to less than 60,000 acres.

The oil in canola seed contains less than 2% erucic acid, compared with 20% to 40% found in oilseed rape. The canola meal remaining after oil extraction contains less than 0.1% glucosinolates (sulfur-containing compounds) compared with about 1% in rapeseed meal. Consequently, canola is also referred to as "double low" or "00" rapeseed. High levels of erucic acid in oilseed rape are hazardous to human health, and high levels of glucosinolates are detrimental in livestock feeds.

Canola (*Brassica napus*) varieties are either spring types or fall-planted winter types. Historically, most all canola grown in Minnesota has been spring types. Fall-planted winter-type canola varieties were evaluated by University of Minnesota researchers more than 15 years ago with limited success due to winter/spring mortality. Since 2002 research on fall-planted winter-type canola varieties has been conducted in Minnesota, again with limited success. Advances in variety development and agronomic production practices provide encouragement that fall-planted winter-type canola varieties can be grown successfully in Minnesota.



Locations of 2008 canola trials.

Seed yield and growth characteristics of non-Roundup Ready canola (Brassica napus) varieties (lb/acre at 8% moisture) at Wannaska in 2008.

Company	Variety	Blackleg Resistance[1]	Seedling Vigor[2]	Days to Flower	Days to Maturity	Height, Inches	Lodging[3]	Yield, Lb/Acre
Bayer	5440	R	2	50	95	45	1	3,102
Bayer	5550	R	1	45	94	38	2	2,964
Bayer	8440	R	1	46	91	30	0	2,936
Bayer	953	N/A	1	43	89	35	2	2,734
Bayer	5630	R	1	52	93	38	3	2,707
Mycogen	DN051874	R	1	49	95	34	3	2,576
Mycogen	845CL	MR	1	49	94	30	0	2,412
Mycogen	DN051692	R	1	48	91	33	1	2,340
Mycogen	DN051535	R	1	45	94	41	6	2,337
Mycogen	DN051607	R	1	50	93	36	3	2,255
Mycogen	830CL	R	1	49	95	43	5	2,246
Mycogen	DN051493	R	1	47	95	43	6	2,191
Mycogen	DN051505	R	1	50	93	39	7	2,065
Mean	2,528							
LSD	308							
CV	8.5							

[1] Blackleg resistance rating provided by seed companies: R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible.
[2] Plant lodging score: 0 = no lodging, 9 = plants lying flat.
[3] Seedling vigor score: 1 = virogous, 9 = no vigor.

Information Sources

The Minnesota Canola Council is a good source for information on canola. The council can be contacted by mail, 4630 Churchill St., Suite 1, St. Paul, MN 55126. Phone 651-638-9883, fax 651-638-0756; email, mncanola@comcast.net.

A complete and revised *Canola Growers Manual* on canola production is available from the Canola Council of Canada, 400-167 Lombard Ave, Winnipeg, Manitoba, Canada, R3B 0T6. Phone 204-982-2100, internet, www.canola-council.org. The manual contains detailed information on canola production practices.

Note that the *Canola Growers Manual* is also available online at www.canola-council.org. Please keep in mind when using this manual that not all pesticides used in Canada are legal in the United States. Always confirm the clearance of a pesticide with your local dealer or county extension educator.

2008 Results

While a fairly late and wet spring provided less than ideal conditions for planting canola in 2008, a cool summer with adequate moisture enabled canola to yield quite well in most areas of Minnesota. Average yields were more than 300 lb/acre higher than in 2007.

Test Plot Research

Test plot establishment and management were supervised by Paul Porter and Derek Crompton.

Seed yield and growth characteristics of Roundup Ready canola (Brassica napus) varieties (lb/acre at 8% moisture) at Roseau in 2008.

Company	Variety	Blackleg Resistance[1]	Seedling Vigor[2]	Days to Flower	Days to Maturity	Height, Inches	Lodging[3]	Yield, Lb/Acre
Dekalb	DKL30-42	R	1	47	91	32	1	2,862
Cargill	V1035	R	2	45	92	36	3	2,841
Dekalb	IS3057	R	1	44	91	36	3	2,827
Mycogen	G2X0039	R	2	47	95	47	6	2,805
Monsanto	G72021	R	1	44	88	28	1	2,798
Dekalb	DKL72-55	MR	1	47	94	37	2	2,784
NoBrand	WE0801	R	1	46	92	33	3	2,739
Croplan	Hyclass 924	R	1	43	91	39	2	2,726
Dekalb	DKL52-41	R	2	47	94	35	3	2,698
Dekalb	DKL52-41PIUS	R	1	46	91	29	1	2,688
Brett Young	6051	MR	1	44	94	46	3	2,687
Integra	IX087121	R	1	43	91	37	4	2,672
Monsanto	G75011	R	1	44	95	43	1	2,645
Dekalb	IS7145	MR	1	46	90	42	5	2,645
Monsanto	G72003	R	1	46	93	34	1	2,631
Monsanto	G75449	R	1	44	92	38	1	2,627
Brett Young	6235	MR	1	47	95	46	1	2,616
Mycogen	G2X0042	R	2	47	94	41	6	2,605
Monsanto	G64034	R	1	44	92	33	1	2,594
Croplan	940	R	2	45	91	38	2	2,573
Pioneer	45H28	R	2	46	95	42	3	2,564
Mycogen	G2X0023	R	1	46	95	38	2	2,546
Cargill	V2018	MR	1	48	91	40	3	2,543
Monsanto	Z4409	R	2	44	94	34	2	2,514
Mycogen	G2X0054	R	2	47	93	40	2	2,514
Mycogen	G2X0024	R	1	49	93	38	4	2,509
Cargill	V1037	R	1	46	93	44	3	2,477
Cargill	04H272	MR	2	48	93	43	4	2,465
Mycogen	G2X0044	R	2	46	95	38	2	2,465
Proseed	30 Caliber	R	2	49	100	38	3	2,460
Proseed	50 Caliber	R	2	45	94	40	3	2,455
Monsanto	G72061	R	1	45	94	39	1	2,433
Cargill	V2010	MR	2	48	93	42	3	2,433
Mycogen	G2x0022	R	2	51	95	47	2	2,273
Proseed	2030	R	2	44	94	41	3	2,209
Proseed	2066	MR	2	49	93	39	3	2,147
Monsanto	G67012	R	1	46	93	32	2	2,128
Mean	2,573							
LSD 0.05	447							
CV (%)	12.0							

[1] Blackleg resistance rating provided by seed companies: R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible.
[2] Plant lodging score: 0 = no lodging, 9 = plants lying flat.
[3] Seedling vigor score: 1 = virogous, 9 = no vigor.

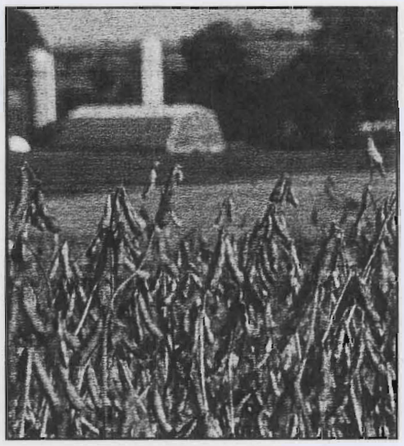
Minnesota Agricultural Experiment Station
University of Minnesota

Varietal Trials Results

January 2009

Soybean

Jim Orf, Seth Naeve, Phil Schaus and Art Killam



Minnesota Agricultural Experiment Station scientists annually conduct performance tests of appropriately adapted public and private soybean varieties. Companies are charged a fee for each variety they enter to partially cover the costs of conducting these tests. A stipulation of the testing program is that the company is marketing or intends to begin marketing the variety in the next growing season.

The 2008 growing season was drier and cooler than normal. The locations in the central zone were affected to a greater degree than locations in the northern and southern zones.

Tables 1 to 3 present data from the conventional public and private variety tests conducted at various locations within the northern, central and southern production zones. The map shows test locations and zone boundaries. All of these tests were planted between May 5 and June 10 at planting rates of 160,000 seeds/acre. Herbicides were used as necessary for good weed control. Row spacings were 30 inches at Becker and Jackson and 10 inches at other locations. Plot combines were used to harvest the plots.

Table 4 provides results of the very early (northern Minnesota) Minnesota variety tests.

Tables 4 to 7 provide results from specific tests of available Roundup Ready® varieties adapted to the far northern, northern, central and southern production zones.

Tables 8 and 9 provide results from performance tests of soybean cyst-nematode-resistant varieties in "infested" field sites near Lamberton, Rosemount and Gaylord in the southern zone; and Rosemount, Gaylord and Svea in the central zone. "Non-infested" field sites were located near Lamberton, Jackson and Waseca in the southern zone and Morris, Becker and Rosemount in the central zones. Planting techniques were the same as the other performance tests.

Tables 10 to 15 provide performance and characteristics data from special-use soybean variety tests. These tests were conducted to provide reliable data for growers who are interested in producing special-use soybeans, which are typically grown under contract.

Table 16 provides important variety characteristics of publicly developed varieties entered in the 2008 tests.

Tables 17 and 18 present SCN information provided by the Nematology laboratory at the University of Minnesota Southern Research and Outreach Center at Waseca. The data are from greenhouse evaluations of varieties from both the central and southern zone trials on 3 HG types (races) of soybean cyst nematode. The level of SCN reproduction from each variety is shown, as well as a resistance rating.

Field reproductive index data from the six trial sites also are shown. Comparisons are best made relative to the susceptible check variety within a column.

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

Seed Treatments

In 2008 entrants were allowed to enter treated seed. The type of seed treatment, as provided by the originator, is designated as follows: CM = Cruiser Maxx, Go = Gaucho, SG = Soy-Gard, SK = SuperKote, TAG = Trilex/ Ale-gience/Gaucho, TX = Trilex AL, TX6 = Trilex 6000, AX = ApronMax, MX = Maxim, MXL = Maxim XL, MXA = Maxim+Actellic = AXM = ApronMax+MaxinXL.

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

Relative Maturity and Calendar Dates of Maturity

Soybeans respond to changing day length, so the actual calendar date of maturity achievement is affected by latitude. Each variety has a narrow range of north-south adaptation. Soybean yield and quality are assured if a variety arrives at physiological maturity before a season-ending freeze occurs. This is determined visually by noting the actual date when 95 percent of the pods show their genetically programmed mature color. These dates for 2008 are provided in the tables. Harvest dates are typically 7 to 14 days later, depending upon drying conditions.

Soybean test locations and maturity zones.

Relative maturity ratings are also provided for each variety. These ratings consist of a number for the maturity group designation (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 variety MN0302 indicated as 0.3, making it an early group 0 variety, while MN0901, with a 0.9 rating, is the latest. These values for public varieties are developed after observing them for several years in many locations. Relative maturity ratings for private varieties in these tables were provided by their owners, and were developed in a similar manner.

Yield

Because maturity is a very important attribute, varieties are arranged in the tables in order of their actual 2008 calendar date of maturity and not yield performance.

Later-maturing varieties usually can be expected to have higher yields than earlier-maturing types. If you wish to correctly compare yields, do so only between varieties with similar calendar dates of maturity, usually within 3 to 5 days. More reliable comparisons can be made using variety yields from several consecutive years. All yield determinations were made from replicated tests harvested with a plot combine.

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 variety 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 values are given on the percent of mean data, not the actual yields. If a yield difference between two varieties within a single column exceeds this LSD value you can assume that the higher-yielding variety was truly better yielding. A 20% level of significance is used in all these tables. This means that yield differences exceeding the stated LSD value are real 80% of the time.

Chlorosis

These ratings are based on how much of the leaf area was yellowing in tests conducted on high-lime (high pH) soils near Lake Lillian and Foxhome in 2008. Comparing chlorosis scores of varieties permits 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. Specific scores and evaluation dates from the 2008 tests are provided at the web site www.soybeans.umn.edu/home.htm.

Some universities and companies use numerical scores rather than word descriptors to describe chlorosis tolerance. A comparison of these systems follows:

Numerical Score		Word Description
1-5 scale	1-9 scale	Rating
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)

Phytophthora

Phytophthora root rot can cause significant yield reductions if susceptible varieties are planted in poorly drained, infested fields. There are several known races of this fungus, so it is important to know which are present in a particular field. Genes can be incorporated into varieties to provide resistance to specific races of this disease.

Genes for resistance to various races of Phytophthora root rot are listed in the table.

Some published information refers to Phytophthora "tolerance" or "field resistance," which is not race-specific and should not be confused with the race-specific resistance indicated in the table. Reliable tests for tolerance have not yet been developed.

The data tables in this report indicate which Phytophthora gene or genes is/are present in each variety. A * is used where the claimed resistance was not verified by greenhouse evaluation. A # following the gene indicates greenhouse bioassay did not agree with originator's designation. The chart below columns one and two indicates which genes provide resistance to the various races.

Protein and Oil

Protein and oil values were determined from mature seed using near infrared reflectance analysis equipment. **The table values are for the 2008 season only. The protein and oil information is presented on a percent of the mean for each test. The actual mean values are given at the bottom of each table.** Values over 100 indicate the protein and/or oil contents of the variety 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 mean protein and oil values are expressed on a 13% moisture basis. The following formula is used to adjust the protein and oil values to another moisture basis.

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

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

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

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)

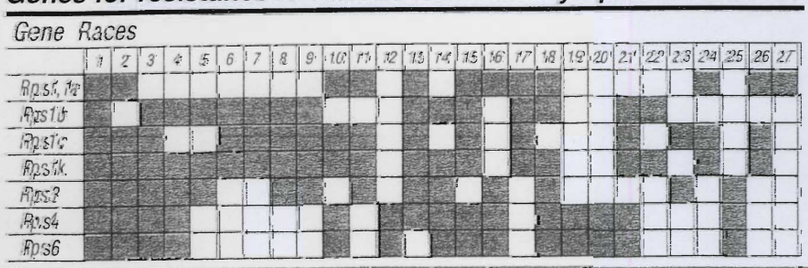
Y = protein content at 13% moisture (in decimals)

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.

Genes for resistance to various races of Phytophthora root rot.



Soybean Cyst Nematode

Soybean Cyst Nematode (SCN) was first identified in Minnesota in 1978 and is now known to occur in many Minnesota counties where soybeans are grown. Both the area of infestation and numbers 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, 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 its impact on yield.

Yield performance results of susceptible (S), low resistant (LR), moderately resistant (MR) and resistant (R) varieties planted in infested and non-infested fields in central and southern Minnesota are provided in Tables 8 and 9. The ratings for SCN resistance in these tables were determined using molecular markers. In tables 17 and 18 ratings for SCN resistance were determined using results from greenhouse bioassays. The reproductive index is calculated as the number of nematodes at the end of the season divided by the number of nematodes at the beginning of the season in soil samples collected from the field plots.

For proper management of fields with SCN, it is recommended that varieties with an R rating be planted. If the SCN population numbers are relatively low (<3,000) a variety with an MR rating might be considered. LR- and S-rated varieties should not be considered for planting in fields where SCN is present.

Management information is available from the web site www.soybeans.umn.edu or from the Minnesota Soybean Research and Promotion Council, 360 Pierce Avenue, Suite 110, N. Mankato, MN 56003, 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 varieties in wider row spacings or at lower populations is the most effective method of reducing the severity of white mold. Accurate ratings for soybean variety resistance to white mold are difficult to obtain because both infection and disease development depend on weather conditions. Because of this variability, a variety's 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 variety performance in the presence of white mold should select varieties that show consistently less white mold during several years of testing.

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 varieties, or longer rotations, assist in the management of this disease.

MN0304, MN0902CN, MN1302, Freeborn, IA1006 and IA2008R, are available public varieties with resistance to BSR.

Private varieties claiming BSR resistance, but not verified by University of Minnesota lab or field tests, are: Pioneer 91Y20, Pioneer 92Y30, NK S01-C9, NK S06-W2, NK S08-C3, NK S10-K1, NK S12-P4, NK S20-P3, GCS 2820NRR, GCS 9822RR, SoDak Genetics SD1071RR, Northstar Genetics NS2223RR, Northstar Genetics NS 0814 (RR?), Northstar Genetics NS 0304 RR, Syngenta (NK) NK S01-C9, Stine 1832-4, Stine 2032-4, Syngenta NK S08-M8, Syngenta NK S13-K2, Syngenta NK S14-C5, Syngenta NK S22-C5, XR-2584 and Northstar Genetcs NS0914NRR.

Some information refers to "tolerance" or "field resistance." Reliable tests for tolerance or field resistance have not yet been developed.

Special-Use Varieties

There continues to be increased 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-use varieties, which were general releases, but more recently varieties have been released under exclusive or nonexclusive licenses to specific companies who then contract with growers for production. For further information contact MCIA at web site www.mncia@umn.edu and telephone number 612-625-7766.

Brand Names Versus Variety Names

"Brand" names and "variety" names are different and are meant to be used for different purposes. Brand names refer to the seed source or the person labeling and selling the seed. Brand does not refer to the genetic makeup of the seed. Variety names refer to the genetic makeup of seed and may only refer to a specific genetic makeup.

Plant breeders are constantly improving varieties, but whenever the genetic makeup is changed a new variety is created and it must have a new variety name. The rate at which new varieties are being developed has dramatically increased in recent years. Branding is a useful way for companies to market their products without having to constantly redo the identification and promotional information they offer.

If a farmer wishes to spread risk by planting products with different genetic makeup, the variety name must be used to determine if two products are truly different. Relying on a brand name alone to make this determination may not result in different varieties being planted.

Test Plot Research

Test plot establishment and management were supervised by Darcy Weston, Gerald Decker, Rafael Echinique, Gerald Holz, Bob Bouvette, Derek Crompton, George Nelson, Steve Quiring, Mark Hanson, John Wiersma, Tom Hoverstad, Matt Bickell, Dave Nicolai and Howard Persons.

Contact addresses and brand names for varieties entered in 2008.

Advantage Seed Inc. (Advantage)	17307 State Highway 22, Good Thunder, MN 56037	507-278-4087	adv@myclearwave.net
AgSource (AgSource)	1800 L Ave, Nevada, IA 50201	515-382-8880	tom.curry@nutechseed.com
Albert Lea Seed House (Viking)	PO Box 127, 1414 W, Main St, Albert Lea, MN 56007	1-800-352-5247	Brian@alseed.com
Anderson Seeds	37825 County Road 63, St. Peter, MN 56082	507-246-5342	njandrsn@myclearwave.net
Crow's (Crow's)	612-E Dunlap St, PO Box 157, Kentland, IN 47951	515-314-1003	wayne.hoener@channelbio.com
Dairyland Seed Co., Inc (Dairyland)	PO Box 958, West Bend, WI 53095	1-800-236-0163	rsecrist@dairylandseed.com
Dyna-Gro (Dyna-Gro)	PO Box 99, Wall Lake, IA 51466	712-664-2444	joel.nelson@uap.com
G2 Genetics (G2 Genetics)	36131 Hwy 69, Forest City, IA 50436	641-581-3350	tom.thompson@nutechseed.com
Gold Country Seed (GCS)	16506 Hwy 15N, PO Box 604, Hutchinson, MN 55350	320-587-1050	dschwartz@goldcountry.seed
Hefty Seed Company (Hefty Seed)	15866 Hwy 5, I-29 Exit 203, Pembina, ND 58271	701-454-6226	byounggren@polarcomm.com
Hyland Seeds (Hyland Seeds)	1015 N. 51st Street, Suite E, Grand Forks, ND 58203	1-800-265-7403	rsnobelen@hylandseeds.com
Kaltenburg Seeds (Kaltenberg)	5506 State Road 19, PO Box 278, Waunakee, WI 53597	608-849-5021	abeechey@kaltenbergseeds.com
Kruger Seeds, Inc. (Kruger, KSC/Challenger)	PO Box A, Dike IA, 50624	1-800-772-2721	blair@krugerseed.com
Latham Seed Company (Latham)	131 180th St., Alexander IA 50420	1-800-798-3258	markg@lathamseeds.com
Legend Seeds Inc. (Legend)	PO Box 241, De Smet, SD 57231	605-854-3346	mknight@smunet.net
Midwest Seed Genetics (Midwest)	1617 E 10th, PO Box 518, Carroll IA 51401	515-314-1003	wayne.hoener@hannelbio.com
Monsanto (Asgrow)	800 N. Lindbergh Blvd., St. Louis, MO 63167	815-754-4809	diane.freeman@monsanto.com
Mustang Seeds (Mustang)	PO Box 466, Madison, SD 57042	605-256-6529	dalenelson@mustangseeds.com
North Star Genetics, Ltd	PO Box 49, Wanamingo, MN 55983	218-437-6638	glenn@rivands.com
NuTech Seed, LLC (NuTech)	36131 Hwy 69, Forest City, IA 50436	641-581-3350	tom.thompson@nutechseed.com
Peterson Farms Seed (PFS)	3104 164 th Ave SE, Harwood ND 58042	701-282-7476	ron@petersonfarmsseed.com
Pioneer Hi-Bred International, Inc (Pioneer)	151 Saint Andrews Court, Mankato, MN 56001	507-344-2014	alan.scott@pioneer.com
Prairie Brand Seed (PBR)	15 X Ave, Story City, IA 50248	515-733-2101	ben@prairiebrandseed.com
Proseed, Inc (Proseed)	705 E. Brewster, Harvey, ND 58341	701-347-4660	proseed@ndak.net
REA Hybrids (REA)	4745 6th Ave SE, PO Box 908, Aberdeen, SD 57402	701-412-6777	mike.reahybrids@yahoo.com
Richland Organics, Inc. (Richland Organics)	100N 10th St, Breckenridge, MN 56520	218-643-1797	andy@richlandorganics.com
Sodak Genetics (Sodak Genetics)	Box 2207A, 1200 N Campus Drive, Brookings, SD 57007	605-688-5418	jack.ingemansen@sdstate.edu
Seeds 2000	PO Box 200, Breckenridge, MN 56520	218-643-2410	kwall@seeds2000.net
Stine Seed Company (Stine)	22555 Laredo Trail, Adel, IA 50003	515-667-2605	pdeby@stineseed.com
SunOpta (Bravado, Valor, Ibis, Calibri)	4111 30th Ave. S, Moorhead, MN 56560	218-287-5510	gene.leach@sunopta.com
Syngenta Seeds (NK Brand)	31250 County 25, Peterson, MN 55962	507-875-2344	eric.stocker@syngenta.com
Thunder Seed Inc (Thunder)	3008 210th St. W, Hawley, MN 56549	218-483-4637	mpetermann7@yahoo.com
Trelay Seed Co. (Trelay)	11623 State Hwy 80, Livingston, WI 53544	608-943-6363	rogert@trelay.com
Winfield Solutions (Croplan Genetics)	PO Box 63281 MS5725, St. Paul, MN 55164	651-765-5718	jrcarlson@landolakes.com
Wensman Seed (Wensman Seed)	PO Box 190, Wadena, MN 56482	320-221-2662	joel.leafblad@wensmanseed.com
Ziller Seed Co., Inc. (Ziller)	76374 380th St, Bird Island, MN 55310	320-365-3674	jaziller@zillerseed.com

Table 1. Performance and characteristics of public and private soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean 2006-2008	2007-2008	2008	Percent of Mean Protein	Oil	Maturity Rating	Phytophthora Gene	Cercospora Score	Seed Treat
7005	Thunder	9-19	—	99	100	103	98	0.5	—	1.6	TX6
MN0071	Minnesota AES	9-19	88	91	90	99	104	00.7	S	2.3	—
Jim	No. Dakota AES	9-20	102	105	103	101	100	00.7	S	2.0	—
Cavalier	No. Dakota AES	9-20	—	—	89	99	103	00.7	Rps6	2.1	—
Bravado	Sunopta	9-23	101	101	111	92	104	0.4	S	1.9	TX6
MN0095	Minnesota AES	9-25	—	—	111	96	104	00.9	Rps1	1.6	—
Valor	Sunopta	9-25	—	—	110	103	95	0.5	Rps1k	1.9	TX6
Traill	No. Dakota AES	9-25	102	100	103	103	98	0.0	Rps1	1.8	—
MN0105	Minnesota AES	9-25	103	102	93	102	100	0.1	Rps1c	2.1	—
MN0107	Minnesota AES	9-26	—	—	101	102	96	0.1	Rps1k	2.1	—
MN0308CN	Minnesota AES	9-28	—	—	98	97	103	0.3	Rps1k	2.0	
SO-0070	Sunopta	9-28	—	—	96	106	96	0.5	S	2.4	TX6
MN0208CN	Minnesota AES	9-29	—	—	103	103	100	0.2	Rps1	2.4	—
MN0604	Minnesota AES	9-29	—	103	101	96	102	0.6	—	2.2	—
MN0101	Minnesota AES	9-29	105	105	99	98	101	0.1	Rps1	1.6	—
MN0201	Minnesota AES	9-30	100	95	92	104	99	0.2	Rps1	2.1	—
Panther	Sunopta	10-2	—	—	94	109	92	0.7	S	2.1	TX6
MN0504	Minnesota AES	10-5	—	—	98	93	102	0.5	Rps1	2.9	—
MN0502	Minnesota AES	10-5	—	—	94	100	100	0.5	—	2.4	—
Mean		9-29	39.0 bu/a	37.4 bu/a	35.7 bu/a	33.8%	18.4%				
LSD 20%			4%	5%	6%						

Table 2. Performance and characteristics of public and private soybean varieties, central zone; Becker, Morris and Rosemount, 2006-2008.

Variety		Maturity	Yield, Percent of Mean			Percent of Mean		Maturity	Phytophthora	Chlorosis	Seed
or Brand	Originator	Date	2006-2008	2007-2008	2008	Protein	Oil	Rating	Gene	Score	Treat
MN0604	Minnesota AES	9-17	—	89	87	101	97	0.6	-	3.3	—
MN0302	Minnesota AES	9-17	91	90	84	101	99	0.3	Rps1k	3.0	—
MN0504	Minnesota AES	9-18	—	—	96	97	98	0.5	-	3.8	—
Sheyenne	No. Dakota AES	9-19	—	108	109	96	97	0.7	Rps1c	2.9	—
MN0701	Minnesota AES	9-19	—	95	94	102	94	0.7	Rps1	3.2	—
MN0502	Minnesota AES	9-19	—	—	78	106	94	0.5	-	3.7	—
Lambert	Minnesota AES	9-20	98	98	102	97	101	0.7	S	3.6	—
Surge	Minn. & S.D. AES	9-21	105	105	111	103	98	0.9	Rps1	3.3	—
MN0806CN	Minnesota AES	9-21	—	97	103	98	101	0.8	S	2.8	—
MN0907	Minnesota AES	9-22	—	—	101	99	100	0.9	-	3.9	—
SR-09	Sunopta	9-23	—	—	112	97	98	0.9	Rps1k	2.4	TX6
MN1401	Minnesota AES	9-23	98	104	107	100	96	1.4	Rps1	2.6	—
MN1506	Minnesota AES	9-23	—	—	102	98	99	1.5	Rps1k	3.1	—
MN1013	Minnesota AES	9-23	—	—	97	103	96	1.0	Rps1k	2.4	—
MN1302	Minnesota AES	9-24	101	102	106	93	102	1.3	Rps1k	3.1	—
SRN14	Sunopta	9-24	—	—	106	105	93	1.4	Rps1k	2.9	TX6
MN1009	Minnesota AES	9-24	98	104	95	100	97	1.0	Rps1k	3.5	—
MN1410	Minnesota AES	9-25	109	111	116	100	97	1.4	S	3.8	—
MN1609	Minnesota AES	9-25	—	—	105	98	96	1.6	-	3.1	—
Minori	Sunopta	9-27	99	99	102	104	94	1.4	Rps1k	3.4	TX6
Mean		9-21	44.0 bu/a	41.9 bu/a	38.8 bu/a	33.9%	19.0%				
LSD 20%			3%	4%	5%						

Table 3. Performance and characteristics of public and private soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2006-2008.

Variety		Maturity	Yield, Percent of Mean			Percent of Mean		Maturity	Phytophthora	Chlorosis	Seed
or Brand	Originator	Date	2006-2008	2007-2008	2008	Protein	Oil	Rating	Gene	Score	Treat
MN1506	Minnesota AES	9-19	—	—	95	100	102	1.5	Rps1k	2.9	—
MN1302	Minnesota AES	9-19	96	82	82	107	96	1.3	Rps1k	2.6	—
MN1609	Minnesota AES	9-20	—	—	88	100	99	1.6	—	3.1	—
O.1692	Viking	9-21	—	—	106	99	99	1.6	—	2.9	—
MN1410	Minnesota AES	9-21	105	95	101	101	102	1.4	S	3.3	—
MN1801	Minnesota AES	9-21	98	89	83	102	102	1.8	Rps1c	2.9	—
IA1007	Iowa AES	9-22	—	—	74	106	94	1.7	—	3.6	—
NT-154	Nutech	9-23	—	—	124	100	99	1.5	S	3.2	—
IA1022	Iowa AES	9-23	—	110	111	90	107	1.7	S	3.0	—
NT-176	Nutech	9-25	—	111	110	100	100	1.7	S	2.9	—
IA1008	Iowa AES	9-25	—	—	100	100	99	2.0	S	3.5	—
O.1898N	Viking	9-25	—	—	96	98	101	1.8	—	3.2	—
NT-212CN	Nutech	9-26	—	114	120	97	101	2.1	Rps1c	3.4	—
O.2265	Viking	9-27	—	—	109	97	100	2.2	—	3.2	—
Mean		9-22	45.7 bu/a	47.1 bu/a	42.7 bu/a	34.1%	18.8%				
LSD 20%			3%	4%	5%						

Table 4. Performance and characteristics of conventional and Roundup Ready public and private soybean varieties, far northern zone; Crookston, Roseau and Thief River Falls, 2006-2008.

Variety		Maturity	Yield, Percent of Mean			Percent of Mean		Maturity	Phytophthora	Chlorosis	Seed
or Brand	Originator	Date	2006-2008	2007-2008	2008	Protein	Oil	Rating	Gene	Score	Treat
RR80-04	Proseed	9-18	—	—	103	103	100	0.04	—	2.3	CM
NS0022RR	North Star Genetics	9-18	—	—	94	104	98	0.3	—	2.9	MX
H0059R	Hefty Seed	9-19	—	—	105	99	105	0.05	—	2.6	—
K-004RR	Kruger	9-19	—	—	103	102	101	0.4	S	2.6	—
NS0021RR	North Star Genetics	9-20	—	—	110	105	100	0.9	Rps1k	2.4	MX
NS0011RR	North Star Genetics	9-20	—	—	104	103	105	0.3	—	2.1	MX
7005	Thunder	9-21	—	—	91	103	99	0.5	S	2.3	TX6
S00-H7	NK	9-21	—	—	84	100	99	0.01	Rps1c	2.4	—

Table 4 (continued). Performance and characteristics of conventional and Roundup Ready public and private soybean varieties, far northern zone; Crookston, Roseau and Thief River Falls, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean 2006-2008	2007-2008	2008	Percent of Mean Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	Seed Treat
30B04	Dyna-Gro	9-22	102	102	104	99	104	0.4	Rps1k	2.1	—
6004	PFS	9-22	—	—	103	102	105	0.4	Rps1k	2.8	TX
AG00501	Asgrow	9-22	—	—	101	97	105	0.05	Rps1k	1.9	CM
MN0071	Minnesota AES	9-22	88	85	82	98	103	00.7	Rps1	2.4	—
27005RR	Thunder	9-23	—	100	104	99	99	0.5	—	2.8	TX6
PB-00578RR	Prairie Brand	9-23	—	—	100	100	104	0.05	S	2.6	CM
H0099R	Hefty Seed	9-23	—	—	99	101	102	0.09	Rps1k	2.3	—
AG00901	Asgrow	9-23	—	99	99	98	99	0.09	S	2.3	CM
S01-C9	NK	9-23	—	—	98	104	98	0.1	Rps1k	2.6	—
NT-0090RR	Nutech	9-24	—	113	115	102	102	0.09	—	2.2	—
W20074RR	Wensman Seed	9-24	110	109	115	96	105	0.07	Rps1k	2.5	CM
H0086R	Hefty Seed	9-24	—	—	107	100	105	0.08	Rps1k	2.8	—
K-007RR	Kruger	9-24	—	—	107	100	102	0.07	S	2.6	—
MN0105	Minnesota AES	9-24	—	101	103	105	95	0.1	Rps1c	3.1	—
PB-00645RR	Prairie Brand	9-24	108	106	101	99	100	0.08	S	2.8	CM
Traill	No. Dakota AES	9-24	103	100	101	104	97	0.0	Rps1	2.4	—
PB-00918RR	Prairie Brand	9-25	—	—	110	100	105	0.09	Rps1k	2.4	CM
7008	PFS	9-25	—	—	109	100	102	0.8	Rps1k	2.8	TX
K-009+RR	Kruger	9-25	108	106	108	101	103	0.09	S	2.8	—
26009RR	Thunder	9-25	105	102	104	101	100	0.9	—	2.7	TX6
Bravado	Sunopta	9-25	107	107	99	96	101	0.4	S	2.4	TX6
9008RR	GCS	9-25	—	—	96	98	97	0.08	—	2.6	TAG
PB-00965RR	Prairie Brand	9-26	—	—	114	102	103	0.09	S	2.8	CM
HS02R28	Hyland Seeds	9-26	—	—	106	98	95	0.2	—	2.5	—
Valor	Sunopta	9-26	—	—	105	104	96	0.5	Rps1k	2.3	TX6
RR50-07	Proseed	9-26	—	—	104	100	102	0.07	Rps1k	2.9	CM
M-0096ERR	Mustang	9-26	—	106	104	102	101	0.09	S	2.8	TX
29009RR	Thunder	9-26	—	—	104	100	102	0.9	Rps1k	2.1	TX6
MN0095	Minnesota AES	9-26	—	102	103	98	99	00.9	Rps1	1.9	—
PB-0107RR	PBR	9-26	—	102	98	100	99	0.1	—	2.8	CM
W 20096RR	Wensman Seed	9-26	—	—	98	100	105	0.09	Rps1k	2.6	CM
RR Russell	Hyland Seeds	9-26	—	—	78	99	105	0.6	—	2.9	—
30M09	Dyna-Gro	9-27	102	104	108	101	105	0.9	—	2.6	—
6015	Nutech	9-27	—	—	105	101	102	0.1	—	2.8	—
32J01	Dyna-Gro	9-27	—	103	101	96	99	0.1	—	2.6	—
901	PFS	9-27	—	100	95	99	101	0.1	—	2.8	TX
1001	PFS	9-27	—	—	93	102	99	0.1	Rps1k	2.1	TX
RR Ramsey	Hyland Seeds	9-27	94	89	92	102	101	0.5	—	2.9	—
MN0107	Minnesota AES	9-27	—	—	89	104	91	0.1	Rps1k	2.8	—
6022	Nutech	9-29	—	—	104	100	99	0.1	—	3.0	—
H 0079R	Hefty Seed	9-29	—	—	90	97	101	0.07	—	3.3	—
Colibri	Sunopta	9-29	78	71	64	95	97	0.3	S	2.8	TX6
T-020RR	Mustang	9-30	—	—	110	99	99	0.2	S	3.3	TX
PB-0218RR	PBR	9-30	—	—	106	100	96	0.2	—	3.1	CM
Ibis	Sunopta	10-1	—	—	108	102	102	0.2	Rps1	2.9	TX6
90Y20	Pioneer Brand	10-1	—	—	107	100	101	0.2	Rps1k	2.1	CM
MN0101	Minnesota AES	10-1	105	103	102	100	99	0.1	Rps1	2.4	—
MN0106RR	Minnesota AES	10-1	—	93	93	102	95	0.1	Rps1	2.6	—
K-028RR	Kruger	10-2	—	—	107	100	99	0.2	Rps1k	3.3	—
DSR-0101RR	Dairyland	10-3	—	—	97	97	98	0.1	—	2.8	—
0901RR	GCS	10-4	—	—	99	95	102	0.1	—	3.1	TAG
6006	Nutech	10-4	—	—	95	98	97	0	—	2.9	—
29018RR	Thunder	10-6	—	—	89	98	97	0.1	—	2.6	TX6
S 00-W3	NK	10-6	—	—	70	97	99	0	Rps1	3.6	—
PB-0356RR	PBR	10-7	—	109	105	99	99	0.4	Rps1	2.3	CM
NS0024	North Star Genetics	10-12	—	—	96	101	92	0.4	—	2.2	MX
Mean		9-26	41.1 bu/a	38.0 bu/a	34.7 bu/a	33.8%	17.4%				
LSD 20%			3%	4%	5%						

Table 5. Performance and characteristics of Roundup Ready soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean 2006-2008	2007-2008	2008	Percent of Mean Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	Seed Treat
K-004RR	Kruger	9-18	—	—	98	105	101	0.04	S	2.8	—
LS0036RR	Legend	9-20	—	—	100	103	102	0.6	Rps1k	2.7	—
NS0021RR	North Star Genetics	9-21	—	—	99	103	103	0.09	Rps1k	2.9	MX
RG7008RR	Rough Rider Genetics	9-23	—	85	87	105	100	—	Rps1k	3.0	—
S01-C9	NK	9-23	—	—	85	106	102	0.1	Rps1k	2.7	—
K-009+RR	Kruger	9-24	96	106	105	104	104	0.09	S	3.1	—
HS 02R28	Hyland Seeds	9-24	—	—	89	101	95	0.2	—	2.9	—
K-007RR	Kruger	9-25	—	—	106	106	98	0.07	S	2.8	—
0081RR	Seeds 2000	9-25	—	101	104	97	104	0.8	Rps1k	3.4	CM
W20074RR	Wensman Seed	9-25	—	99	98	98	103	0.07	Rps1k	3.0	CM
PR-0107RR	Prairie Brand	9-26	—	104	101	96	103	0.1	S	3.3	—
W20096RR	Wensman Seed	9-26	—	—	98	102	101	0.09	Rps1k	2.8	CM
PB-0218RR	PBR	9-26	—	—	96	99	100	0.2	S	3.6	CM
6022	Nutech	9-26	—	—	95	101	101	0.1	S	3.8	—
RG600RR	Rough Rider Genetics	9-26	—	94	95	102	102	—	—	3.6	—
RG200RR	Rough Rider Genetics	9-26	—	—	88	108	95	—	Rps1	3.5	—
RR Ridgeway	Hyland Seeds	9-27	89	95	102	98	99	0.2	—	3.2	—
LS0087RR	Legend	9-27	—	—	91	100	103	0.1	Rps1k	3.4	—
PB-00965RR	Prairie Brand	9-28	99	107	112	102	103	0.09	S	3.0	—
6015	Nutech	9-28	—	—	90	99	102	0.1	—	3.3	—
90Y20	Pioneer Brand	9-30	—	—	104	99	99	0.2	Rps1k	3.2	CM
W2025RR	Wensman Seed	9-30	—	—	103	101	101	0.2	Rps1k#	3.8	CM
K-028RR	Kruger	9-30	—	—	99	102	99	0.2	Rps1k	3.2	—
PB-0498RR	Prairie Brand	10-1	—	—	116	100	98	0.5	Rps1k	3.0	—
6858	REA	10-1	—	—	109	102	99	0.5	Rps1k	3.1	—
RR80-50	Proseed	10-1	—	—	106	101	101	0.3	Rps1k	3.1	CM
PB-0216RR	PBR	10-1	100	108	105	96	101	0.2	Rps1k	3.3	CM
PB-0554RR	Prairie Brand	10-1	102	103	104	97	100	0.5	S	3.5	—
MN0106RR	Minnesota AES	10-1	—	—	90	107	91	0.1	Rps1	3.8	—
S06-W2	NK	10-2	—	—	110	99	95	0.6	—	3.4	—
AG0401	Asgrow	10-3	—	—	105	102	95	0.4	Rps1	2.5	CM
RR70-30	Proseed	10-3	—	—	102	102	96	0.3	—	3.7	CM
NS0304RR	North Star Genetics	10-3	—	—	100	102	97	0.3	—	3.4	MX
NS0093RR	North Star Genetics	10-3	—	—	94	98	99	0.1	—	3.7	MX
2901RR	Thunder	10-3	—	—	91	97	100	0.1	S	3.7	TX6
M-047RR	Mustang	10-4	102	104	106	98	101	0.3	Rps1	3.3	TX
0901RR	GCS	10-4	—	101	103	97	101	0.1	S	3.9	TAG
M-036RR	Mustang	10-4	93	90	88	97	100	0.3	Rps1	3.3	TX
AG0604	Asgrow	10-5	104	111	117	99	100	0.6	Rps1k	3.3	CM
DSR-0401/RR	Dairyland	10-5	106	110	113	103	98	0.4	—	3.4	—
W2030RR	Wensman Seed	10-5	106	107	108	98	103	0.3	Rps1	2.6	CM
PB-0356RR	PBR	10-5	101	102	104	96	102	0.4	Rps1	3.4	CM
RR60-40	Proseed	10-5	—	—	104	98	99	0.3	Rps1	2.9	CM
2703RR	GCS	10-5	—	—	102	100	99	0.3	Rps1	2.9	TAG
2703RR	Thunder	10-5	103	96	102	99	98	0.3	S	3.8	TX6
NS0413RR	North Star Genetics	10-5	—	—	100	97	99	0.4	Rps1	3.0	MX
704	PFS	10-5	—	—	87	97	98	0.4	—	3.4	—
DSR-0602/RR	Dairyland	10-6	—	—	115	99	101	0.6	Rps1c	3.3	—
DSR-0701/RR	Dairyland	10-6	104	106	115	103	99	0.7	Rps1k	3.6	—
6750	REA	10-6	—	—	104	97	102	0.5	Rps1	3.0	—
NT-0330RR	Nutech	10-6	100	98	101	97	102	0.3	Rps1	3.0	—
PB-0636RR	PBR	10-6	—	99	101	95	101	0.6	S	3.3	CM
MN0309RR	Minnesota AES	10-6	—	—	84	103	101	0.3	Rps1k	3.8	—
703RR	Thunder	10-7	100	101	105	97	101	0.3	Rps1	2.9	TX6
806	PFS	10-7	—	—	92	95	100	0.6	—	3.1	—
905	PFS	10-7	—	—	87	100	98	0.5	S	3.1	—
NT-0636	Nutech	10-8	—	—	109	96	99	0.6	—	3.6	—
MN0401RR	Minnesota AES	10-8	88	89	87	97	103	0.4	S	3.3	—
MN0503RR	Minnesota AES	10-8	—	84	87	105	97	0.5	Rps1k	3.4	—
DSR-0903/RR	Dairyland	10-9	—	—	101	102	99	0.9	Rps1c	3.6	—
Mean		10-1	45.1 bu/a	40.3 bu/a	36.0 bu/a	31.9%	18.8%				
LSD 20%			3%	3%	6%						

Greenhouse test results do not agree with originator's designation.

Table 6. Performance and characteristics of Roundup Ready soybean varieties, central zone; Becker, Morris and Rosemount, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean 2006-2008	2007-2008	2008	Percent of Mean Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	Seed Treat
K-079RR	KSC/Challenger	9-19	—	—	96	106	99	0.7	Rps1k	3.0	—
2806RR	GCS	9-19	—	98	94	99	101	0.6	—	2.6	TAG
W2060RR	Wensman Seed	9-19	—	—	90	102	98	0.6	S	3.2	CM
K-058RR	KSC/Challenger	9-20	—	—	102	102	98	0.5	Rps1k	1.9	—
GR0603	Midwest Seed	9-20	—	—	102	100	101	0.6	—	3.0	—
2906RR	Thunder	9-20	—	—	97	101	99	0.6	S	3.7	TX6
AG0808	Asgrow	9-20	—	—	91	96	102	0.8	Rps1k	2.4	CM
0905RR	GCS	9-20	—	—	91	101	100	0.5	Rps1k	3.0	TAG
90M60	Pioneer Brand	9-20	—	—	91	103	98	0.6	Rps1c	2.5	CM
SD1071RR	Sodak Genetics	9-20	—	—	89	102	101	0.7	—	3.0	—
SD1093RR	Sodak Genetics	9-21	—	—	98	103	101	0.9	—	2.9	—
K-042RR	Kruger	9-21	106	103	96	100	104	0.4	Rps1	2.3	—
G2-7095	G2 Genetics	9-21	—	—	93	103	102	0.9	Rps1k	3.9	—
S08-C3	NK	9-21	—	—	93	98	100	0.8	Rps1c	3.4	—
C0915R	Crows	9-21	—	—	91	98	99	0.9	S	2.3	—
RR Richwood	Hyland Seeds	9-21	102	95	90	99	99	0.9	—	2.5	—
SD1111RR	Sodak Genetics	9-21	97	92	90	98	105	1.1	S	3.9	—
DSR-1055/RR	Dairyland	9-21	—	—	87	95	104	1.0	—	3.3	—
MN0503RR	Minnesota AES	9-21	—	82	85	106	98	0.5	Rps1	2.8	—
RR Rockport	Hyland Seeds	9-21	87	85	82	99	103	0.6	—	2.6	—
K-091RR	Kruger	9-22	—	105	106	101	96	0.9	S	2.8	—
W2108RR	Wensman Seed	9-22	108	106	105	102	98	1.0	S	3.8	CM
AG0803	Asgrow	9-22	—	—	102	97	103	0.8	Rps1k	3.1	CM
S10-K1	NK	9-22	—	—	102	105	95	1.0	Rps1	3.3	—
RR80-90	Proseed	9-22	—	—	101	104	101	0.9	—	3.3	CM
RR61-00	Proseed	9-22	—	—	99	102	98	1.0	Rps1c	3.1	CM
2908RR	Thunder	9-22	—	—	96	96	100	0.8	Rps1k	3.1	TX6
0908NRR	GCS	9-22	—	—	93	98	99	0.8	—	2.4	TAG
MN1107RR	Minnesota AES	9-22	—	91	85	103	99	1.1	Rps1	2.6	—
2090RR	Seeds 2000	9-23	—	—	109	106	96	0.9	—	3.4	CM
W2090RR	Wensman Seed	9-23	107	107	107	102	99	0.9	S	3.6	CM
NT-0990	Nutech	9-23	—	—	106	102	99	0.9	—	3.1	—
2910RR	Thunder	9-23	—	—	103	102	101	1.0	S	3.3	TX6
S12-P4	NK	9-23	—	—	102	104	97	1.2	Rps1c	3.8	—
LS 0906RR	Legend	9-23	—	—	101	100	102	0.9	Rps1c	2.8	—
NS0853RR	North Star Genetics	9-23	—	—	101	102	101	0.9	—	4.0	MX
2120RR	Seeds 2000	9-23	—	104	100	101	97	1.2	Rps1k	3.3	CM
PB-0936RR	Prairie Brand	9-23	108	103	99	101	100	0.9	S	3.1	—
G2-7148	G2 Genetics	9-23	—	—	98	104	98	1.4	—	3.7	—
K-072+RR	Kruger	9-23	—	103	97	101	100	0.8	Rps1	3.4	—
RR80-80	Proseed	9-23	—	—	97	97	102	0.8	Rps1k	3.1	CM
W2126RR	Wensman Seed	9-23	—	—	96	100	102	1.2	S	2.9	CM
DST10-000/RR	Dairyland	9-23	—	—	93	100	99	1.0	—	3.3	—
AG1102	Asgrow	9-23	—	97	92	98	99	1.1	Rps1k	2.9	CM
91Y20	Pioneer Brand	9-23	—	—	92	101	99	1.2	Rps1k	3.3	CM
NT-0886	Nutech	9-24	—	—	114	102	98	0.8	—	3.3	—
AG1403	Asgrow	9-24	—	110	111	97	98	1.4	S	2.6	CM
2135RR	Trelay	9-24	—	—	109	99	99	1.3	Rps1k	3.5	CM
G2-7151	G2 Genetics	9-24	—	—	108	98	97	1.5	Rps1k+6	3.0	—
M-168RR	Mustang	9-24	—	107	105	98	105	1.6	S	3.3	TX
BT7131NR	Ziller	9-24	—	104	104	101	102	1.3	Rps1k	3.6	—
NS1311NRR	North Star Genetics	9-24	—	—	100	98	100	1.3	—	3.3	MX
PB-1182XRR	PBR	9-24	—	—	96	102	98	1.2	S	2.6	CM
PB-0738RR	PBR	9-24	—	—	95	97	98	0.8	S	3.1	CM
RR60-95	Proseed	9-24	—	—	95	97	101	0.9	Rps1c	2.8	CM
C1415R	Crows	9-24	—	—	94	97	104	1.2	Rps1k	3.7	—
M-089RR	Mustang	9-24	—	—	94	98	98	0.8	Rps1k	3.6	TX
NS1212RR	North Star Genetics	9-24	—	—	90	100	98	1.2	Rps1k	3.7	MX
1015	PFS	9-25	—	—	115	98	103	1.5	Rps1k	3.8	—
NS1423NRR	North Star Genetics	9-25	—	—	114	98	104	0.8	Rps1k	3.4	MX

Table 6 (continued). Performance and characteristics of Roundup Ready soybean varieties, central zone; Becker, Morris and Rosemount, 2006-2008.

Variety		Maturity	Yield, Percent of Mean			Percent of Mean		Maturity	Phytophthora	Chlorosis	Seed
or Brand	Originator	Date	2006-2008	2007-2008	2008	Protein	Oil	Rating	Gene	Score	Treat
LS1436RRN	Legend	9-25	—	—	113	104	99	1.4	Rps1k	3.4	—
PB-1557NRR	Prairie Brand	9-25	—	109	111	97	103	1.5	S	3.0	—
AG1506	Asgrow	9-25	—	—	109	98	104	1.5	Rps1k	3.9	—
7154	Nutech	9-25	—	—	109	97	102	1.5	—	3.5	—
PB-1578NRR	Prairie Brand	9-25	—	—	109	95	104	1.5	S	3.8	—
K-142RR	KSC/Challenger	9-25	—	105	108	101	103	1.4	Rps1k	2.7	—
K-129RR	KSC/Challenger	9-25	—	—	107	102	99	1.2	S	2.7	—
PB-1607RR	Prairie Brand	9-25	—	108	107	99	98	1.6	S	3.1	—
S14-N1	NK	9-25	—	—	106	98	103	1.4	Rps1k	3.3	—
1013	PFS	9-25	—	—	103	102	99	1.3	—	3.4	—
M-139RR	Mustang	9-25	—	—	102	103	99	1.3	S	3.0	TX
AG-7155	Agsource	9-25	—	—	101	95	104	1.5	Rps1k	3.6	—
6134	Nutech	9-25	—	—	101	102	99	1.3	—	2.8	—
AG-6145	Agsource	9-25	—	—	100	100	101	1.4	—	4.2	—
1913RR	GCS	9-25	—	—	100	101	98	1.3	—	2.5	TAG
K-147RR/SCN	Kruger	9-25	—	101	100	100	101	1.2	Rps1k	2.7	—
GR1431	Midwest Seed	9-25	—	—	100	99	103	1.2	Rps1k	3.3	—
PB-1358RR	PBR	9-25	—	—	100	103	98	1.3	S	2.7	CM
DSR-1601RR	Dairyland	9-25	—	—	96	98	101	1.6	Rps1k	3.9	—
PB-1188XRR	Sansgaard	9-25	—	—	96	100	99	1.5	Rps1k	3.6	—
2165RR	Trelay	9-26	—	—	115	95	103	1.6	Rps1k#	3.7	CM
EXP.47615NR	Ziller	9-26	—	—	112	97	102	1.5	Rps1k	3.9	—
PB-1885NRR	PBR	9-26	—	—	110	96	102	1.5	S	3.3	CM
1915NRR	GCS	9-26	—	—	105	95	104	1.5	Rps1k#	3.6	TAG
AG1406	Asgrow	9-26	—	—	102	102	101	1.4	S	3.4	CM
Mean		9-23	47.9 bu/a	48.2 bu/a	44.1 bu/a	33.2%	19.3%				
LSD 20%			3%	3%	5%						

Greenhouse test results do not agree with originator's designation.

Table 7. Performance and characteristics of Roundup Ready soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2006-2008.

Variety		Maturity	Yield, Percent of Mean			Percent of Mean		Maturity	Phytophthora	Chlorosis	Seed
or Brand	Originator	Date	2006-2008	2007-2008	2008	Protein	Oil	Rating	Gene	Score	Treat
NS1423NRR	North Star Genetics	9-20	—	—	97	102	102	1.4	Rps1k	2.6	MX
K-142RR	Kruger	9-21	—	—	97	102	100	1.4	Rps1k	2.6	—
7186	G2 Genetics	9-21	—	—	95	98	102	1.8	Rps1k	2.8	—
2165	Trelay	9-22	—	—	104	97	103	1.6	Rps1k	2.8	CM
S17-B5	NK	9-22	—	—	102	98	97	1.7	Rps1c	3.3	—
1915NRR	GCS	9-22	—	—	99	97	102	1.5	Rps1k	3.4	TAG
2166	Trelay	9-22	—	95	99	100	97	1.6	Rps1k	2.6	CM
C1617R	Crows	9-22	—	—	97	98	102	1.6	Rps1k	2.8	—
K-163RR	KSC/Challenger	9-22	—	—	95	100	101	1.6	Rps1k	2.6	—
S18-Y3	NK	9-22	—	—	95	104	95	1.8	Rps1k	3.6	—
SD1161RR/SCN	Sodak Genetics	9-22	—	94	95	103	96	1.6	Rps1	2.9	—
MN1504RR	Minnesota AES	9-22	88	84	92	103	100	1.5	Rps1k	2.7	—
PB-1838NRR	PBR	9-22	—	—	90	100	100	1.8	Rps1k	2.9	CM
MN1803RR	Minnesota AES	9-22	93	82	80	104	99	1.8	Rps1	3.3	—
PB-1089XNRR	Sansgaard	9-23	—	—	108	99	102	1.9	Rps1c	2.3	—
181CNR	Anderson Seeds	9-23	—	—	102	98	102	1.7	Rps1k	2.7	—
AG1802	Asgrow	9-23	—	—	102	98	102	1.8	Rps1k	2.9	CM
K-167RR/SCN	Kruger	9-23	—	—	102	98	103	1.6	Rps1k	2.8	—
153CNR	Anderson Seeds	9-23	—	—	98	99	101	1.5	Rps1k	2.6	—
AG1906	Asgrow	9-23	—	—	95	100	100	1.9	Rps1k	3.8	CM
91Y90	Pioneer Brand	9-23	—	—	95	102	98	1.9	—	3.1	CM
C1816R	Crows	9-23	—	—	94	102	97	1.8	Rps1k	3.9	—
AG1703	Asgrow	9-24	—	—	107	98	102	1.7	Rps1k#	2.8	CM
PB-2058NRR	Prairie Brand	9-24	—	—	104	100	101	2.0	Rps1k	2.8	—

Table 7 (continued). Performance and characteristics of Roundup Ready soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean 2006-2008	2007-2008	2008	Percent of Mean Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	Seed Treat
7211	G2 Genetics	9-24	—	102	103	102	94	2.1	Rps1k	2.8	—
NT-1717RRR/SCN	Nutech	9-24	—	—	102	97	105	1.7	—	2.9	—
M-207RR	Mustang	9-24	105	104	101	99	98	2.0	S	2.6	TX
1918RR	GCS	9-24	—	—	95	104	97	1.8	Rps1k	3.5	TAG
GR1632	Midwest Seed Genetics	9-24	—	—	95	98	103	1.6	Rps1k	3.1	—
191CNR	Anderson Seeds	9-24	—	—	94	100	102	1.9	Rps1k	2.8	—
2195	Trelay	9-24	—	—	91	101	98	1.9	—	2.6	CM
AG6193	Agsource	9-25	—	—	105	103	99	1.9	—	2.8	—
1908CNRR	Viking	9-25	—	—	105	100	102	1.9	Rps1k	2.4	—
NT-1808 RR	Nutech	9-25	—	—	104	100	99	1.8	Rps1c	2.5	—
PB-2297NRR	Sansgaard	9-25	—	103	102	100	102	2.2	Rps1k	2.7	—
2198NRR	Viking	9-25	—	—	102	99	101	2.1	—	2.7	—
2820NRR	GCS	9-25	—	—	101	98	105	2.0	—	3.5	TAG
PB-2007NRR	Sansgaard	9-25	—	103	100	98	100	2.0	Rps1c	2.4	—
BT7208NR	Ziller	9-25	—	—	99	97	106	2.0	Rps1c	2.9	—
2090RR	Viking	9-25	—	—	98	102	99	2.0	S	2.4	—
PB-2183NRR	Prairie Brand	9-25	104	98	97	100	102	2.0	Rps1k	2.9	—
M-199RR	Mustang	9-25	—	—	96	99	99	1.9	S	2.9	TX
201CNR	Anderson Seeds	9-25	—	—	93	99	104	2.0	Rps1c#	2.6	—
PB-2207NRR	Sansgaard	9-26	—	107	109	97	102	2.2	Rps1k	3.0	—
K-201RR/SCN	Kruger	9-26	—	107	108	102	102	2.0	Rps1c	2.8	—
C2216R	Crows	9-26	—	—	104	96	101	2.2	Rps1k	3.2	—
7201	Nutech	9-26	—	—	103	98	103	2.0	—	3.1	—
PB-2117NRR	PBR	9-26	—	107	102	100	101	2.1	S	2.8	CM
L1983R	Latham	9-26	—	—	98	97	103	1.9	Rps1c	2.5	—
LS2024RRN	Legend	9-26	—	—	98	99	102	2.0	Rps1k	3.7	—
PB-2056NRR	PBR	9-26	110	103	98	101	102	2.0	Rps1c	2.8	CM
BT7217NR	Ziller	9-26	—	—	97	98	102	2.1	S	3.0	—
AG6212	Agsource	9-26	—	—	95	100	100	2.1	—	3.7	—
K-189RR/SCN	KSC/Challenger	9-26	—	—	91	102	98	1.8	Rps1k#	3.4	—
2203	Trelay	9-27	—	—	107	96	103	2.0	Rps1k#	3.0	CM
E2083R	Latham	9-27	—	—	106	100	102	2.0	Rps1k	2.8	—
K-204RR/SCN	Kruger	9-27	—	107	105	97	103	2.0	Rps1k	3.3	—
S21-N6	NK	9-27	—	—	105	97	102	2.1	Rps1k	4.1	—
AG2108	Asgrow	9-27	—	103	103	101	96	2.1	S	2.9	CM
PB-1958NRR	PBR	9-27	—	—	103	100	99	1.9	Rps1c	3.9	CM
PB-2347NRR	Prairie Brand	9-27	—	—	102	100	96	2.2	Rps1k	2.8	—
S20-P3	NK	9-27	—	—	101	103	99	2.0	Rps3a*	3.4	—
AG2002	Asgrow	9-27	—	—	100	104	97	2.0	Rps1c	2.9	CM
PB-2196NRR	Prairie Brand	9-27	—	—	99	102	98	2.1	Rps1k	2.8	—
M-219RR	Mustang	9-27	—	—	97	104	98	2.1	S	3.3	TX
LS2298RRN	Legend	9-28	—	—	103	100	101	2.2	Rps1k	3.0	—
92Y30	Pioneer Brand	9-28	—	—	103	99	99	2.3	Rps1k	2.6	CM
GR2131	Midwest Seed Genetics	9-28	—	—	99	95	103	2.1	Rps1k	2.8	—
L2085R	Latham	9-28	—	—	98	102	98	2.0	Rps1c	3.3	—
2274RR	Viking	9-28	—	—	97	100	97	2.2	—	3.1	—
7222	Nutech	9-29	—	—	109	97	102	2.2	Rps1k	3.0	—
K-228RR/SCN	KSC/Challenger	9-29	—	—	108	95	103	2.2	Rps1k	3.8	—
AG6224	Agsource	9-29	—	—	107	104	96	2.2	—	3.3	—
GR2233	Midwest Seed Genetics	9-29	—	—	106	97	101	2.2	Rps1k	2.9	—
7226	G2 Genetics	9-29	—	—	104	102	99	2.2	Rps1k	2.9	—
L2285R	Latham	9-29	—	—	103	98	101	2.2	Rps1k	2.7	—
KB2309RR	Kaltenberg	9-29	—	—	92	102	97	2.3	Rps1k	3.3	MXA
NS2223RR	North Star Genetics	9-29	—	—	91	99	97	2.2	Rps1k#	2.9	MX
DSR-2200/RR	Dairyland	9-30	—	102	106	104	95	2.2	—	3.3	—
DSR-2300/RR	Dairyland	9-30	—	—	105	101	98	2.3	Rps1k	2.6	—
K-239RR	KSC/Challenger	9-30	—	—	99	102	98	2.3	S	2.9	—
KB249RR	Kaltenberg	9-30	—	—	98	106	96	2.4	—	4.2	MXA
DST25-00Z/RR	Dairyland	10-1	—	—	110	106	94	2.5	—	2.8	—
9822RR	GCS	10-1	—	—	102	103	98	2.2	—	3.0	TAG
Mean		9-25	51.0 bu/a	50.8 bu/a	49.6 bu/a	33.0%	19.1%				
LSD 20%			3%	4%	5%						

Greenhouse test results do not agree with originator's designation.
* Originator provided Rps gene information; not evaluated by U of Minnesota.

Table 8. Performance and characteristics of soybean varieties,central zone, at soybean-cyst-nematode-infested (Gaylord, Rosemount and Svea) and non-infested (Becker, Morris and Rosemount) sites, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean: Infested Sites 06-08	07-08	2008	Non-Infested Sites 06-08	07-08	2008	Percent of Mean: Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	SCN Rating	Seed Treat
MN0308CN	Minnesota AES	9-14	73	72	65	70	65	54	103	102	0.3	S	2.4	R	—
Sheyenne	No. Dakota AES	9-15	—	86	81	—	102	91	98	102	0.7	Rps1c	2.1	S	—
MN0208CN	Minnesota AES	9-15	—	—	74	—	—	74	107	100	0.2	Rps1	2.8	R	—
MN1106CN	Minnesota AES	9-16	—	—	85	—	—	80	102	101	1.1	—	3.2	R	—
MN0506RRCN	Minnesota AES	9-16	—	—	75	—	—	75	107	99	0.5	—	2.5	R	—
90M80	Pioneer Brand	9-17	—	100	96	—	93	87	93	104	0.8	Rps1c	3.1	R	CM
MN0902CN	Minnesota AES	9-17	91	95	93	91	87	88	104	96	0.9	S	2.9	R	—
S08-M8	NK	9-17	103	98	92	102	102	106	99	98	0.8	—	3.6	R	—
0562-4	Stine	9-17	—	—	89	—	—	102	103	103	0.6	—	3.0	R	—
MN1011CN	Minnesota AES	9-17	92	97	89	95	95	93	101	93	1.0	Rps1	2.6	R	—
MN0606CN	Minnesota AES	9-17	86	89	87	92	92	91	101	99	0.6	S	3.2	R	—
MN0602	Minnesota AES	9-17	75	71	74	90	88	86	103	97	0.6	S	2.4	S	—
AG0803	Asgrow	9-18	105	104	97	103	100	100	101	100	0.8	Rps1k	2.9	R	CM
HX07RS01	Hyland Seeds	9-18	—	—	94	—	—	97	101	103	0.7	—	2.9	R	—
70-60	Proseed	9-19	—	—	96	—	—	95	103	102	0.6	Rps1k	3.0	R	CM
S14-C5	NK	9-19	—	—	95	—	—	102	104	94	1.4	Rps1k	3.1	R	—
MN0806CN	Minnesota AES	9-19	—	95	92	—	92	89	100	103	0.8	S	2.7	R	—
MN0908CN	Minnesota AES	9-19	—	—	92	—	—	97	101	99	0.9	S	3.2	R	—
S13-K2	NK	9-20	—	118	112	—	107	103	99	98	1.3	Rps1k	3.1	R	—
7151	G2 Genetics	9-21	—	—	99	—	—	104	102	99	1.5	Rps1k	2.7	R	—
RC1320	Croplan Genetics	9-22	—	—	101	—	—	94	99	99	1.3	Rps1k#	3.0	R	—
K-147RR/SCN	Kruger	9-22	—	103	101	—	108	113	101	99	1.2	Rps1k	3.0	R	—
MN1410	Minnesota AES	9-22	54	92	99	107	109	107	103	98	1.4	S	3.4	S	—
1832-4	Stine	9-22	—	—	97	—	—	102	98	102	1.8	Rps1k#	3.1	R	—
PB-1557NRR	Prairie Brand	9-23	—	118	117	—	112	109	97	102	1.5	Rps1k	3.2	R	—
7154	Nutech Seed	9-23	—	—	116	—	—	115	97	99	1.5	Rps1k	3.3	R	—
7186	G2 Genetics	9-23	—	—	110	—	—	108	97	100	1.8	Rps1k	3.4	R	—
PB-1085XNRR	PBR	9-23	—	—	99	—	—	102	99	99	1.5	S	3.6	R	CM
M-159NRR	Mustang	9-24	—	—	118	—	—	119	97	101	1.5	Rps1k6	3.2	R	TX
PB-1885NRR	Prairie Brand	9-24	114	118	115	118	114	118	96	100	1.8	Rps1k	3.5	R	—
AG1506	Asgrow	9-24	—	—	113	—	—	117	100	99	1.5	Rps1k	3.6	R	CM
PB-1578NRR	Prairie Brand	9-24	—	—	113	—	—	116	96	101	1.5	Rps1k	3.2	R	—
PB-1838NRR	Prairie Brand	9-24	—	—	113	—	—	106	101	99	1.8	Rps1k	3.6	R	—
7155	Nutech Seed	9-24	—	—	112	—	—	117	97	101	1.5	Rps1	3.5	R	—
181CNR	Anderson Seeds	9-24	—	—	108	—	—	105	98	101	1.7	Rps1k	3.6	R	—
K-189R/SCN	KSC/Challenger	9-24	—	—	106	—	—	83	102	97	1.8	Rps1k	3.9	R	—
NS1423RR	North Star Genetics	9-24	—	—	100	—	—	101	101	101	1.4	Rps1k	2.8	R	AXM
AG1802	Asgrow	9-25	—	—	104	—	—	116	99	100	1.8	Rps1k	3.1	R	CM
M-177NRR	Mustang	9-26	115	119	117	118	114	112	96	102	1.7	Rps1k6	3.4	R	TX
RC1700	Croplan Genetics	9-26	—	—	110	—	—	75	98	102	1.7	Rps1k	3.3	R	—
L1738R	Latham	9-27	—	—	117	—	—	98	104	96	1.7	S	3.8	R	—
NT-7193+RR/SCN	Nutech Seed	9-27	—	—	99	—	—	116	99	101	1.9	Rps1k	2.9	R	—
NT-1808RR/SCN	Nutech Seed	9-28	110	112	117	113	107	112	101	98	1.8	Rps1c	3.0	R	—
K-167RR/SCN	Kruger	9-28	—	112	111	—	113	111	98	101	1.6	Rps1k	3.6	R	—
91Y70	Pioneer Brand	9-29	—	—	110	—	—	113	97	103	1.7	S	3.1	R	CM
Mean		9-21	36.8 bu/a	40.4 bu/a	45.4 bu/a	46.1 bu/a	45.6 bu/a	41.7 bu/a	33.6%	19.4%					
LSD 20%			4%	4%	6%	3%	3%	5%							

Greenhouse test results do not agree with originator's designation.

Table 9. Performance and characteristics of soybean varieties, southern zone, at soybean-cyst-nematode-infested (Gaylord, Lamberton and Rosemount) and non-infested (Jackson, Lamberton and Waseca) sites, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean: Infested Sites 06-08	07-08	2008	Non-Infested Sites 06-08	07-08	2008	Percent of Mean: Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	SCN Rating	Seed Treat
MN1011CN	Minnesota AES	9-23	88	84	79	84	84	82	101	97	1.0	Rps1	2.4	R	—
MN1106CN	Minnesota AES	9-24	—	—	87	—	—	80	104	101	1.1	—	3.0	R	—
MN1410	Minnesota AES	9-26	89	87	82	101	99	105	105	98	1.4	S	2.6	S	—
7186	G2 Genetics	9-27	—	—	100	—	—	98	100	102	1.8	Rps1k	2.8	MR	—
MN0908CN	Minnesota AES	9-27	—	—	87	—	—	80	103	99	0.9	—	3.3	R	—
RC1320	Croplan Genetics	9-28	—	—	105	—	—	98	96	103	1.3	Rps1k	3.3	R	—
181CNR	Anderson Seeds	9-29	109	106	106	105	102	104	97	102	1.7	Rps1k	3.0	R	—
IA1022	Iowa AES	9-29	—	99	103	—	93	91	94	105	2.0	S	3.1	R	—
153CNR	Anderson Seeds	9-29	—	—	100	—	—	105	97	103	1.5	Rps1k	3.6	R	—
MN1701CN	Minnesota AES	9-29	101	93	98	98	94	95	101	99	1.7	—	2.8	R	—
91Y91	Pioneer Brand	9-29	—	—	93	—	—	99	104	96	1.9	Rps1k	2.6	MR	CM
RC1700	Croplan Genetics	9-29	—	—	91	—	—	93	96	103	1.7	Rps1k	3.6	R	—
K-167RR/SCN	KSC/Challenger	9-29	—	—	90	—	—	98	98	103	1.6	Rps1k	2.8	R	—
1832-4	Stine	9-29	—	95	89	—	97	96	99	102	1.8	Rps1k	2.6	R	—
Freeborn	Minnesota AES	9-29	88	85	87	88	88	97	107	94	1.6	S	2.7	R	—
K-189R/SCN	KSC/Challenger	9-29	—	—	86	—	—	82	103	99	1.8	Rps1k	3.1	R	—
193NRR	Viking	9-29	—	—	82	—	—	88	101	97	1.9	—	3.6	R	—
2032-4	Stine	9-29	—	—	80	—	—	106	101	102	2.0	Rps1k	2.2	R	—
AG2110	Asgrow	9-30	—	—	121	—	—	95	101	99	2.1	Rps1	2.8	MR	CM
AG1802	Asgrow	9-30	—	111	112	—	106	110	99	102	1.8	Rps1k	3.8	R	CM
L1738R	Latham	9-30	—	—	112	—	—	101	104	94	1.7	S	3.8	R	—
M-194NRR	Mustang	9-30	107	105	108	104	102	100	98	102	1.9	Rps1k	2.8	R	TX
2014NRR	North Star Genetics	9-30	—	—	106	—	—	99	98	103	2.0	Rps1k	3.2	R	AXM
7211	G2 Genetics	9-30	—	—	104	—	—	99	101	96	2.1	Rps1k	3.4	MR	—
K-170RR/SCN	Kruger	9-30	—	100	104	—	105	106	104	96	1.7	S	3.3	R	—
191CNR	Anderson Seeds	9-30	107	99	102	103	99	102	99	103	1.9	Rps1k	3.2	R	—
PB-1885NRR	Prairie Brand	9-30	107	103	99	108	106	110	99	104	1.8	Rps1k	2.8	R	—
AG2107	Asgrow	9-30	103	99	98	105	103	109	100	103	2.1	Rpsk+7	3.2	R	CM
92Y20	Pioneer Brand	9-30	—	—	96	—	—	106	100	101	2.2	Rps1k#	2.8	MR	CM
1932-4	Stine	9-30	—	100	94	—	103	104	105	101	2.0	—	2.5	R	—
IA2068	Iowa AES	9-30	98	95	93	96	91	96	95	101	2.1	—	3.3	R	—
7201	Nutech	10-1	—	—	115	—	—	109	98	103	2.0	Rps1c	2.8	R	—
201CNR	Anderson Seeds	10-1	—	102	108	—	98	100	95	103	2.0	Rps1c	3.3	R	—
8820RR	GCS	10-1	—	—	108	—	—	107	96	102	2.0	—	3.3	R	TAG
RC2068	Croplan Genetics	10-1	—	—	105	—	—	99	98	99	2.0	Rps1k	4.2	R	—
K-204RR/SCN	Kruger	10-1	—	109	105	—	103	101	96	102	2.0	Rps1k	3.6	R	—
K-201RR/SCN	Kruger	10-1	—	102	104	—	99	102	101	101	2.0	Rps1c	2.8	R	—
NT-7193+RR/SCN	Nutech	10-1	—	—	104	—	—	107	101	101	1.9	Rps1k	2.7	R	—
PB-2007NRR	Prairie Brand	10-1	—	107	104	—	103	107	98	102	2.0	Rps1c	2.8	R	—
RC2100	Croplan Genetics	10-1	—	—	103	—	—	105	97	102	2.1	Rps1k	3.8	R	—
S23-N7	NK	10-1	—	—	103	—	—	103	100	96	2.3	S	2.9	R	—
M-209NRR	Mustang	10-1	—	—	101	—	—	103	99	100	2.0	S	2.8	R	TX
GR2233	Midwest Seed	10-1	—	—	99	—	—	98	97	101	2.2	Rps1k	3.3	R	—
AG1906	Asgrow	10-1	—	—	98	—	—	97	102	100	1.9	Rps1k#	3.7	R	CM
S22-C5	NK	10-1	—	—	95	—	—	94	104	94	2.2	Rps1c*	2.3	MR	—
K-249RR/SCN	KSC/Challenger	10-1	—	—	91	—	—	101	104	95	2.4	S	3.9	R	—
2062-4	Stine	10-1	—	97	91	—	105	106	97	103	2.0	Rps1k	2.8	R	—
M-217NRR	Mustang	10-1	99	96	89	103	104	107	99	101	2.1	Rps1k	3.6	R	TX
PB-2347NRR	Prairie Brand	10-1	—	—	79	—	—	103	102	97	2.2	Rps1k	2.6	R	—
AG2002	Asgrow	10-2	—	108	122	—	98	102	101	99	2.0	Rps1c	2.9	R	CM
7226	G2 Genetics	10-2	—	—	121	—	—	99	99	100	2.2	Rps1k	3.3	MR	—
PB-2117NRR	PBR	10-2	—	107	113	—	102	107	101	97	2.1	S	3.5	R	CM
AG2108	Asgrow	10-2	—	106	112	—	102	105	99	102	2.1	S	3.4	R	CM
7216	Nutech	10-2	—	—	110	—	—	102	99	99	2.1	—	3.0	R	—
2106CR	Advantage	10-2	—	—	106	—	—	104	97	103	2.2	Rps1k	3.7	R	—
PB-2207NRR	PBR	10-2	—	105	106	—	107	113	96	104	2.2	Rps1k	3.2	R	CM

Greenhouse test results do not agree with originator's designation.

* Originator provided Rps gene information; not evaluated by U of Minnesota.

Table 9 (continued). Performance and characteristics of soybean varieties, southern zone, at soybean-cyst-nematode-infested (Gaylord, Lamberton and Rosemount) and non-infested (Jackson, Lamberton and Waseca) sites, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean: Infested Sites 06-08	07-08	2008	Non-Infested Sites 06-08	07-08	2008	Percent of Mean: Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	SCN Rating	Seed Treat
2160CR	Advantage	10-2	—	—	100	—	—	103	99	101	2.2	Rps1	3.7	R	—
K-228RR/SCN	KSC/Challenger	10-2	—	—	100	—	—	96	95	102	2.2	Rps1k	3.5	R	—
7222	Nutech	10-2	—	99	99	—	106	106	96	101	2.2	Rps1k	3.3	R	—
S19-L7	NK	10-2	104	99	92	104	104	106	101	99	—	—	3.0	R	—
92Y30	Pioneer Brand	10-3	—	—	109	—	—	102	101	98	2.3	Rps1k	2.8	R	CM
PB-2058NRR	Prairie Brand	10-3	—	—	102	—	—	100	100	99	2.0	Rps1k	2.6	R	—
PB-1958NRR	PBR	10-3	—	—	99	—	—	99	103	100	1.9	Rps1c	3.4	R	CM
XR-2584	NK	10-4	—	—	111	—	—	101	102	96	2.4	—	3.4	R	—
M-190NRR	Mustang	10-4	—	—	110	—	—	102	100	99	1.9	Rps1c	4.0	R	TX
K-248RR/SCN	Kruger	10-4	—	104	99	—	96	94	102	101	2.4	S	3.7	R	—
E1958R	Latham	10-4	—	—	99	—	—	96	101	98	1.9	Rps1c	3.8	R	—
Mean		9-30	39.7 bu/a	39.7 bu/a	38.0 bu/a	51.7 bu/a	50.5 bu/a	46.7 bu/a	33.8%	18.8%					
LSD 20%			3%	3%	5%	2%	3%	4%							

Table 10. Characteristics of special-use soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2008.

Variety or Brand	Originator	Maturity Rating	Special Characteristics	Hilum Color	Phytophthora Gene	Chlorosis Score	Seeds/Lb.
MN0071	Minnesota AES	00.7	General Purpose	Brown	S	2.3	3,243
MN0096SP	Minnesota AES	00.9	Higher Protein	Yellow	S	2.1	2,967
Traill	No. Dakota AES	0.0	General Purpose	Yellow	Rps1	1.8	3,110
MN0107	Minnesota AES	0.1	General Purpose	Yellow	Rps1k	2.1	3,027
MN0082SP	Minnesota AES	00.8	Small Seed	Yellow	Rps1	1.9	7,567
MN0094SP	Minnesota AES	00.9	Large Seed, Higher Protein	Black	Rps1	2.3	2,204
MN0308CN	Minnesota AES	0.3	General Purpose	Yellow	Rps1k	2.0	3,948
MN0208CN	Minnesota AES	0.2	General Purpose	Yellow	Rps1	2.4	3,914
MN0104SP	Minnesota AES	0.1	Large Seed, Higher Protein	Black	Rps1	2.8	2,522
MN0201	Minnesota AES	0.2	General Purpose	Yellow	Rps1	2.1	3,519
MN0103SP	Minnesota AES	0.1	Small Seed	Yellow	Rps1	2.1	6,486
MN0306SP	Minnesota AES	0.3	Large Seed	Black	Rps1	3.1	2,686
MN0093SP	Minnesota AES	00.9	Small Seed	Grey	Rps1	2.1	5,675
MN0207SP	Minnesota AES	0.2	Small Seed	Yellow	Rps1	2.0	7,443
MK0205	Richland Organics	0.2	Small Seed	Yellow	Rps1	2.1	5,821
MK0649	Richland Organics	0.3	Small Seed	Yellow	Rps1c	1.8	6,486
MN0307SP	Minnesota AES	0.3	Large Seed	Yellow	Rps1c	1.9	2,624
MN0402SP	Minnesota AES	0.4	Small Seed	Yellow	Rps1	2.1	5,974
MN0605SP	Minnesota AES	0.6	Higher Protein	Buff	Rps1c	1.8	3,068
MN0303SP	Minnesota AES	0.3	Small Seed	Yellow	Rps1	2.6	6,219
MK0508	Richland Organics	0.3	Small Seed	Yellow	S	2.1	5,675
MN0403SP	Minnesota AES	0.4	Small Seed	Yellow	Rps1	1.9	6,879

Table 11. Performance of special-use soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean	
			2006-2008	2007-2008	2008	Protein	Oil
MN0071	Minnesota AES	9-19	95	103	96	98	106
MN0096SP	Minnesota AES	9-23	—	108	94	116	92
Traill	No. Dakota AES	9-25	112	115	110	102	101
MN0107	Minnesota AES	9-26	—	—	108	101	98
MN0082SP	Minnesota AES	9-27	100	96	105	95	101
MN0094SP	Minnesota AES	9-27	—	102	97	104	96
MN0308CN	Minnesota AES	9-28	—	—	105	96	106
MN0208CN	Minnesota AES	9-29	—	—	111	102	102
MN0104SP	Minnesota AES	9-29	—	118	109	102	98
MN0201	Minnesota AES	9-30	108	106	99	103	101
MN0103SP	Minnesota AES	9-30	93	87	92	94	104
MN0306SP	Minnesota AES	9-30	94	91	79	99	103
MN0093SP	Minnesota AES	10-1	—	108	114	94	104
MN0207SP	Minnesota AES	10-1	—	96	96	92	102
MK0205	Richland Organics	10-2	101	95	99	100	101
MK0649	Richland Organics	10-3	100	99	102	98	101
MN0307SP	Minnesota AES	10-3	—	112	97	98	104
MN0402SP	Minnesota AES	10-4	—	90	97	97	99
MN0605SP	Minnesota AES	10-5	—	105	97	114	90
MN0303SP	Minnesota AES	10-5	99	93	96	96	101
MK0508	Richland Organics	10-6	—	—	110	96	97
MN0403SP	Minnesota AES	10-6	—	78	90	100	97
Mean		9-30	36.1 bu/a	33.3 bu/a	33.3 bu/a	34.0%	18.0%
LSD 20%			4%	4%	6%		

Table 12. Characteristics of special-use soybean varieties, central zone; Becker, Morris and Rosemount, 2008.

Variety or Brand	Originator	Maturity Rating	Special Characteristics	Hilum Color	Phytophthora Gene	Chlorosis Score	Seeds/Lb.
MN0501SP	Minnesota AES	0.5	Small Seed	Yellow	Rps1	2.9	4,243
MN0603SP	Minnesota AES	0.6	Small Seed	Yellow	Rps1	3.4	6,580
MK9532	Richland Organics	0.9	Small Seed	Yellow	S	3.9	4,586
Toyopro	Minnesota AES	0.8	Higher Protein	Yellow	S	3.8	3,363
MN1012SP	Minnesota AES	1.0	Small Seed	Yellow	Rps1	4.2	6,306
Sheyenne	No. Dakota AES	0.7	General Purpose	Yellow	Rps1c	2.9	3,047
MN1004SP	Minnesota AES	1.0	Low Sat., Low Linolenic Acid	Black	Rps1	3.9	2,820
MK0508	Richland Organics	0.3	Small Seed	Yellow	S	2.7	5,470
SB133	Minnesota AES	0.6	Small Seed	Yellow	—	2.6	4,779
Lambert	Minnesota AES	0.7	General Purpose	Buff	S	3.6	3,110
MN0605SP	Minnesota AES	0.6	Higher Protein	Buff	Rps1c	3.2	2,910
MN1103SP	Minnesota AES	1.1	Low Linolenic Acid	Black	Rps1	3.4	2,609
MN0805SP	Minnesota AES	0.8	Small Seed	Yellow	Rps6	3.5	5,675
MN0102SP	Minnesota AES	0.1	Small Seed	Yellow	S	2.6	4,830
MN0803SP	Minnesota AES	0.8	Higher Protein	Yellow	Rps1	2.9	4,882
Surge	Minn. & S.D. AES	0.9	General Purpose	Imperfect Black	Rps1	3.3	2,441
MN0804SP	Minnesota AES	0.8	Higher Protein	Yellow	Rps1	4.1	2,785
MN0806CN	Minnesota AES	0.8	General Purpose	Yellow	S	2.8	3,492
MN0903SP	Minnesota AES	0.9	Large Seed, Higher Protein	Yellow	Rps1	3.5	2,671
SB623	Minnesota AES	0.9	Large Seed, Higher Protein	Yellow	—	2.1	1,549
MK1016	Richland Organics	1.0	Large Seed	Yellow	S	4.0	1,720
MN1203SP	Minnesota AES	1.2	Small Seed	Yellow	—	3.7	4,882
MN1401BL	Minnesota AES	1.4	Black Seed Coat	Black	Rps1	3.3	2,377
MN0907	Minnesota AES	0.9	General Purpose	Yellow	—	3.9	2,855
ProSoy	No. Dakota AES	0.4	Higher Protein	Buff	Rps1	3.2	2,640
MN1101SP	Minnesota AES	1.1	Large Seed, Higher Protein	Yellow	Rps1	3.9	2,259
MN1410	Minnesota AES	1.4	General Purpose	Buff	S	3.8	2,768
SB313	Minnesota AES	1.3	Higher Protein, Black Seed Coat	Black	—	3.3	1,713
MN0807SP	Minnesota AES	0.8	Higher Protein	Yellow	S	2.7	2,768
MN1503SP	Minnesota AES	1.5	Higher Protein	Yellow	Rps1	2.8	2,402

Table 13. Performance of special-use soybean varieties, central zone; Becker, Morris and Rosemount, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean	
			2006-2008	2007-2008	2008	Protein	Oil
MN0501SP	Minnesota AES	9-17	75	66	70	97	106
MN0603SP	Minnesota AES	9-17	78	77	69	97	99
MK9532	Richland Organics	9-18	96	92	94	91	107
Toyopro	Minnesota AES	9-18	96	96	94	109	94
MN1012SP	Minnesota AES	9-18	—	—	85	95	99
Sheyenne	No. Dakota AES	9-19	—	128	125	93	105
MN1004SP	Minnesota AES	9-19	85	84	89	100	98
MK0508	Richland Organics	9-19	—	—	87	95	102
SB133	Minnesota AES	9-19	—	—	76	96	107
Lambert	Minnesota AES	9-20	115	114	118	93	108
MN0605SP	Minnesota AES	9-20	—	—	114	112	90
MN1103SP	Minnesota AES	9-20	108	110	107	99	103
MN0805SP	Minnesota AES	9-20	89	89	83	108	91
MN0102SP	Minnesota AES	9-20	—	—	79	102	95
MN0803SP	Minnesota AES	9-20	87	83	79	101	98
Surge	Minn. & S.D. AES	9-21	124	123	128	99	106
MN0804SP	Minnesota AES	9-21	—	117	120	105	94
MN0806CN	Minnesota AES	9-21	—	—	118	94	109
MN0903SP	Minnesota AES	9-21	100	105	107	104	99
SB623	Minnesota AES	9-21	—	—	100	105	93
MK1016	Richland Organics	9-21	—	80	86	98	98
MN1203SP	Minnesota AES	9-21	96	92	82	90	101
MN1401BL	Minnesota AES	9-22	—	—	122	102	105
MN0907	Minnesota AES	9-22	—	—	116	95	108
ProSoy	No. Dakota AES	9-22	—	—	110	103	99
MN1101SP	Minnesota AES	9-24	110	113	110	104	96
MN1410	Minnesota AES	9-25	125	123	134	96	104
SB313	Minnesota AES	9-25	—	—	104	107	96
MN0807SP	Minnesota AES	9-25	—	—	79	113	88
MN1503SP	Minnesota AES	9-26	113	113	114	101	98
Mean		9-21	37.8 bu/a	36.8 bu/a	33.6 bu/a	35.3%	18.1%
LSD 20%			4%	5%	6%		

Table 14. Characteristics of special-use soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2008.

Variety or Brand	Originator	Maturity Rating	Special Characteristics	Hilum Color	Phytophthora Gene	Chlorosis Score	Seeds/Lb.
MN1004SP	Minnesota AES	1.0	Low Sat, Low Linolenic Acid	Black	Rps1	3.6	3,388
MN1401BL	Minnesota AES	1.4	Black Seed Coat	Black	Rps1	3.0	2,967
MN1101SP	Minnesota AES	1.1	Large Seed, Higher Protein	Yellow	Rps1	3.5	2,752
MN1411SP	Minnesota AES	1.4	Large Seed	Yellow	Rps1c	3.8	2,640
MN1309SP	Minnesota AES	1.3	Higher Protein	Black	—	3.3	2,967
MN1310SP	Minnesota AES	1.3	Low Saturates	Imperfect Black	—	3.4	3,603
MN1302	Minnesota AES	1.3	General Purpose	Buff	Rps1k	2.6	2,508
MN1412SP	Minnesota AES	1.4	Higher Protein	Black	Rps1c	3.8	3,632
IA1021	Iowa AES	1.6	General Purpose	Yellow	—	3.3	3,027
MN1104SP	Minnesota AES	1.1	Higher Protein	Yellow	—	2.6	2,609
MN1308SP	Minnesota AES	1.3	Large Seed	Buff	Rps1c	3.4	2,441
MN1502SP	Minnesota AES	1.5	Large Seed, Higher Protein	Yellow	Rps1	3.5	2,702
MN1410	Minnesota AES	1.4	General Purpose	Buff	S	3.3	3,243
MN1508SP	Minnesota AES	1.5	Large Seed, Higher Protein	Buff	Rps1	2.9	2,873
MN1505SP	Minnesota AES	1.5	Large Seed, Higher Protein	Yellow	Rps1	3.1	2,735
MN1607SP	Minnesota AES	1.6	Large Seed, Higher Protein	Yellow	Rps1	2.9	2,565
MN1503SP	Minnesota AES	1.5	Large Seed, Higher Protein	Yellow	Rps1	3.3	2,655
IA1022	Iowa AES	1.7	General Purpose	Yellow	S	3.0	3,175
IA1020	Iowa AES	1.8	Low Saturates	Brown	—	2.9	3,982
MN1702SP	Minnesota AES	1.7	1% Linolenic Acid	Black	—	3.2	3,388

Table 14 (continued). Characteristics of special-use soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2008.

Variety or Brand	Originator	Maturity Rating	Special Characteristics	Hilum Color	Phytophthora Gene	Chlorosis Score	Seeds/Lb.
MN1806SP	Minnesota AES	1.8	Higher Protein	Yellow	Rps1	3.4	2,248
IA2067	Iowa AES	2.4	Large Seed, Higher Protein	Yellow	—	3.4	2,225
IA2073	Iowa AES	2.4	1% Linolenic Acid	Black	—	3.4	3,547
IA1010	Iowa AES	1.9	Large Seed	Yellow	—	3.9	1,831
MN1805SP	Minnesota AES	1.8	Large Seed, Higher Protein	Yellow	Rps1	3.8	2,248
MN2001SP	Minnesota AES	2.0	Large Seed, Higher Protein	Yellow	Rps1	3.1	2,293
Vinton 81	Iowa AES	2.0	Large Seed, Higher Protein	Yellow	Rps1c	3.3	2,415
K-220RR/SCN/LINO	KSC/Challenger	2.4	<3% Linolenic Acid	Imperfect Black	Rps1c	2.8	2,802
K-245RR/SCN/LINO	KSC/Challenger	2.4	<3% Linolenic Acid	Buff	Rps1c	4.3	3,175
IA3024	Iowa AES	2.6	1% Linolenic Acid	Imperfect Black	S	3.4	3,027

Table 15. Performance of special-use soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2006-2008.

Variety or Brand	Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean	
			2006-2008	2007-2008	2008	Protein	Oil
MN1004SP	Minnesota AES	9-15	88	84	85	100	99
MN1401BL	Minnesota AES	9-18	—	—	104	101	104
MN1101SP	Minnesota AES	9-18	95	95	88	106	98
MN1411SP	Minnesota AES	9-18	—	—	83	102	98
MN1309SP	Minnesota AES	9-19	—	—	99	101	103
MN1310SP	Minnesota AES	9-19	—	—	96	100	100
MN1302	Minnesota AES	9-19	107	101	96	102	100
MN1412SP	Minnesota AES	9-19	—	—	78	116	83
IA1021	Iowa AES	9-20	113	111	115	97	98
MN1104SP	Minnesota AES	9-20	—	—	104	99	103
MN1308SP	Minnesota AES	9-20	—	—	99	102	101
MN1502SP	Minnesota AES	9-20	93	92	89	99	103
MN1410	Minnesota AES	9-21	120	121	119	96	106
MN1508SP	Minnesota AES	9-21	—	—	99	102	101
MN1505SP	Minnesota AES	9-21	108	104	97	103	102
MN1607SP	Minnesota AES	9-21	100	99	95	100	101
MN1503SP	Minnesota AES	9-22	100	102	96	100	102
IA1022	Iowa AES	9-23	—	—	130	86	112
IA1020	Iowa AES	9-23	—	—	117	94	99
MN1702SP	Minnesota AES	9-23	—	—	93	98	101
MN1806SP	Minnesota AES	9-23	—	—	89	106	96
IA2067	Iowa AES	9-24	104	104	90	105	97
IA2073	Iowa AES	9-25	113	109	114	94	100
IA1010	Iowa AES	9-26	96	96	109	98	95
MN1805SP	Minnesota AES	9-26	101	97	100	107	96
MN2001SP	Minnesota AES	9-26	89	87	82	104	96
Vinton 81	Iowa AES	9-26	74	68	78	103	97
K-220RR/SCN/LINO	KSC/Challenger	9-27	—	115	116	97	102
K-245RR/SCN/LINO	KSC/Challenger	9-29	—	116	119	95	103
IA3024	Iowa AES	10-1	—	—	118	90	106
Mean		9-22	42.2 bu/a	40.4 bu/a	36.1 bu/a	36.0%	18.1%
LSD 20%			4%	5%	6%		

Table 16. Characteristics of publicly developed soybean varieties entered in 2008 tests.

Variety or Brand	Originator	Maturity Rating	Phytophthora Gene	BSR Reaction	SCN Reaction	Chlorosis Score
Cavalier	No. Dakota AES	00.7	Rps6	—	—	2.1
Jim	No. Dakota AES	00.7	S	S	S	2.0
MN0071	Minnesota AES	00.7	Rps1	S	S	2.3
MN0095	Minnesota AES	0.0	Rps1	S	S	1.6
Traill	No. Dakota AES	0.0	S	S	S	1.8
MN0101	Minnesota AES	0.1	Rps1	—	S	1.6
MN0105	Minnesota AES	0.1	Rps1c	—	S	2.1
MN0106RR	Minnesota AES	0.1	Rps1	—	S	2.6
MN0107	Minnesota AES	0.1	Rps1k	—	—	2.1
MN0201	Minnesota AES	0.2	Rps1	—	S	2.1
MN0208CN	Minnesota AES	0.2	Rps1	—	R	2.4
MN0302	Minnesota AES	0.3	Rps1k	S	S	3.0
MN0308CN	Minnesota AES	0.3	Rps1k	—	R	2.0
MN0309RR	Minnesota AES	0.3	Rps1k	—	—	3.8
MN0401RR	Minnesota AES	0.4	Rps1	—	S	3.3
MN0502	Minnesota AES	0.5	-	—	—	2.4
MN0503RR	Minnesota AES	0.5	S	—	S	3.4
MN0504	Minnesota AES	0.5	Rps1	—	—	2.9
MN0506RRCN	Minnesota AES	0.5	-	—	R	2.5
MN0602	Minnesota AES	0.6	-	—	S	2.4
MN0604	Minnesota AES	0.6	Rps6	—	S	3.3
MN0606CN	Minnesota AES	0.6	-	—	R	3.2
Lambert	Minnesota AES	0.7	Rps1	S	S	3.6
MN0701	Minnesota AES	0.7	Rps1	—	S	3.2
Sheyenne	No. Dakota AES	0.7	Rps1c	—	S	2.9
MN0806CN	Minnesota AES	0.8	S	—	R	2.8
MN0902CN	Minnesota AES	0.9	S	R	R	2.9
MN0907	Minnesota AES	0.9	-	—	—	3.9
MN0908CN	Minnesota AES	0.9	S	—	R	3.2
Surge	Minn. & S.D. AES	0.9	Rsp1	S	S	3.3
MN1009	Minnesota AES	1.0	Rps1k	—	S	3.5
MN1011CN	Minnesota AES	1.0	Rps1	—	R	2.6
MN1013	Minnesota AES	1.0	Rps1k	—	—	2.4
MN1106CN	Minnesota AES	1.1		—	R	3.2
MN1107RR	Minnesota AES	1.1	Rps1	—	S	2.6
MN1302	Minnesota AES	1.3	Rps1k	—	S	3.1
MN1401	Minnesota AES	1.4	Rps1	—	S	2.6
MN1410	Minnesota AES	1.4	S	R	S	3.8
MN1504RR	Minnesota AES	1.5	Rps1k	—	S	2.7
MN1506	Minnesota AES	1.5	Rps1k	—	—	3.1
Freeborn	Minnesota AES	1.6	Rps1	R	R	2.7
IA1021	Iowa AES	1.6	S	—	—	3.3
MN1609	Minnesota AES	1.6	-	—	—	3.1
IA1007	Iowa AES	1.7	-	—	—	3.6
MN1701CN	Minnesota AES	1.7	-	—	R	2.8
MN1801	Minnesota AES	1.8	Rps1c	S	S	2.9
MN1803RR	Minnesota AES	1.8	Rps1	—	S	3.3
IA1008	Iowa AES	2.0	S	—	R	3.5
IA1022	Iowa AES	2.0	S	S	R	3.1
IA2068	Iowa AES	2.1	S	S	R	3.3

Table 17. Greenhouse bioassay and field plot test of soybean varieties in central zone in Minnesota for resistance to soybean cyst nematode.

Variety or Brand	Originator	Maturity Rating	SCN Resistance Source[1]	Greenhouse Test HG Type 0 (race 3) FI	Res.[2]	HG Type 2 (race 1) FI	Res.[2]	HG Type 1.3 (race 14) FI	Res.[2]	Field Reproductive Index Svea (Pi = 303) Pf/Pi	Rosemount (Pi = 13800) Pf/Pi	Gaylord (Pi = 909) Pf/Pi
181CNR	Anderson Seeds	1.7	PI88788	34.1	LR	63.1	S	34.2	LR	0.37	0.23	1.22
AG0803	Asgrow	0.8	PI88788	46.2	LR	77.1	S	27.7	MR	2.15	0.32	1.94
AG1506	Asgrow	1.5	N	49.2	LR	71.2	S	38.2	LR	0.33	0.31	1.14
AG1802	Asgrow	1.8	PI88788	46.4	LR	80.5	S	32.9	LR	1.49	0.08	0.10
RC1320	Croplan Genetics	1.3	N	IS	IS	IS	IS	IS	IS	1.69	0.09	—
RC1700	Croplan Genetics	1.7	N	IS	IS	IS	IS	IS	IS	0.70	0.12	0.34
7151	G2 Genetics	1.5	PI88788	30.0	MR	46.2	LR	9.2	R	9.53	0.29	1.64
7186	G2 Genetics	1.8	N	1.0	R	9.5	R	97.4	S	0.95	0.24	0.21
HX07RS01	Hyland Seeds	0.7	N	41.7	LR	63.0	S	30.4	LR	1.36	0.18	0.15
K-147RR/SCN	Kruger	1.2	N	54.4	LR	77.1	S	56.1	LR	3.75	0.38	0.43
K-167RR/SCN	Kruger	1.6	N	46.6	LR	84.8	S	27.1	MR	1.73	0.26	0.59
K-189R/SCN	KSC/Challenger	1.8	N	49.6	LR	57.4	LR	31.3	LR	3.88	0.32	0.41
L1738R	Latham	1.7	PI88788	43.8	LR	57.2	LR	60.1	S	1.49	0.26	0.63
M-159NRR	Mustang	1.5	N	37.8	LR	63.1	S	38.2	LR	2.31	0.50	1.02
M-177NRR	Mustang	1.7	PI88788	41.7	LR	71.2	S	34.7	LR	1.11	0.28	1.00
S08-M8	NK	0.8	PI88788	43.5	LR	69.1	S	87.6	S	10.56	0.53	0.67
S13-K2	NK	1.3	PI88788	61.0	S	71.0	S	17.2	MR	3.84	0.29	0.01
S14-C5	NK	1.4	N	28.0	MR	52.0	LR	14.2	MR	3.84	0.33	2.61
NS1423RR	North Star Genetics	0.4	N	38.0	LR	53.4	LR	49.0	LR	5.12	0.47	0.50
7154	Nutech Seed	1.5	N	41.0	LR	82.2	S	31.0	LR	0.37	0.56	0.61
7155	Nutech Seed	1.5	N	65.0	S	84.3	S	31.6	LR	2.48	0.38	0.63
NT-1808RR/SCN	Nutech Seed	1.8	PI88788	74.8	S	65.3	S	31.4	LR	1.65	0.53	0.40
NT-7193+RR/SCN	Nutech Seed	1.9	PI88788	67.7	S	76.8	S	30.6	LR	0.74	0.51	0.78
PB-1085XNRR	PBR	1.5	N	117.6	S	91.4	S	39.5	LR	10.07	0.67	0.63
90M80	Pioneer Brand	0.8	Peking	54.3	LR	50.4	LR	74.8	S	11.80	0.26	1.68
91Y70	Pioneer Brand	1.7	PI88788	58.2	LR	61.4	S	27.9	MR	3.88	0.58	0.84
PB-1557NRR	Prairie Brand	1.5	PI88788	77.9	S	81.4	S	37.4	LR	1.32	0.41	1.35
PB-1578NRR	Prairie Brand	1.5	N	68.2	S	77.5	S	34.8	LR	1.24	0.39	2.21
PB-1838NRR	Prairie Brand	1.8	N	73.3	S	63.7	S	23.6	MR	1.57	0.43	0.70
PB-1885NRR	Prairie Brand	1.8	PI88788	68.8	S	70.5	S	33.6	LR	2.35	0.43	0.15
70-60	Proseed	0.6	N	40.1	LR	72.7	S	23.8	MR	1.16	0.63	1.93
0562-4	Stine	0.6	N	65.7	S	76.6	S	22.6	MR	2.64	0.54	0.29
1832-4	Stine	1.8	N	IS	IS	IS	IS	IS	IS	3.59	0.60	—
MN0308CN	Minnesota AES	0.3	PI88788	54.4	LR	72.4	S	5.9	R	1.44	0.69	0.92
MN0602	Minnesota AES	0.6	S	152.7	S	97.6	S	104.9	S	53.30	1.09	8.37
MN0606CN	Minnesota AES	0.6	PI88788	19.6	MR	45.4	LR	9.3	R	1.32	0.53	1.55
MN0806CN	Minnesota AES	0.8	PI88788	20.7	MR	52.6	LR	4.8	R	0.91	0.56	1.22
MN0902CN	Minnesota AES	0.9	PI88788	18.0	MR	53.0	LR	6.0	R	0.33	0.56	0.19
MN1011CN	Minnesota AES	1.0	PI88788	42.8	LR	90.7	S	10.7	MR	1.61	0.54	1.16
MN1106CN	Minnesota AES	1.1	209/437	47.8	LR	87.5	S	29.4	MR	1.07	0.66	0.11
MN1410	Minnesota AES	1.4	S	99.5	S	100.0	S	116.6	S	41.25	0.98	7.71
Sheyenne	No. Dakota AES	0.7	S	111.8	S	103.1	S	134.4	S	83.33	1.40	10.11
MN0908CN	Minnesota AES	0.9	887/209	32.7	LR	62.0	S	17.0	MR	3.38	0.50	0.55
MN0506RRCN	Minnesota AES	0.5	PI88788	9.0	R	43.1	LR	25.6	MR	3.14	0.67	0.03
MN0208CN	Minnesota AES	0.2	PI88788	38.3	LR	83.2	S	9.4	R	0.50	0.45	2.05

[1] The information of source of resistance was provided by companies. N = no data provided. IS = insufficient seed to test. 209/437 = PI209332 and/or PI437654, 887/209 = PI88788 and/or PI209332. S = susceptible.

[2] SCN resistance rating: R = resistant at FI 10% or less; MR = moderately resistant at FI 11-30%; LR =low resistant at FI 31-60%; S = susceptiple at FI >60%.

Table 18. Greenhouse bioassay and field plot test of soybean varieties in southern zone in Minnesota for resistance to soybean cyst nematode.

Variety or Brand	Originator	Maturity Rating	SCN Resistance Source[1]	Greenhouse Test: HG Type 0 (race 3) FI	HG Type 0 (race 3) Res.[2]	HG Type 2 (race 1) FI	HG Type 2 (race 1) Res.[2]	HG Type 1.3 (race 14) FI	HG Type 1.3 (race 14) Res.[2]	Field Reproductive Index: Lamberton (Pi = 9469) Pf/Pi	Rosemount (Pi = 10,204) Pf/Pi	Gaylord (Pi = 909) Pf/Pi
2106CR	Advantage	2.2	N	53.6	LR	63.5	S	54.0	LR	1.08	0.51	2.67
2160CR	Advantage	2.2	N	41.7	LR	48.9	LR	50.7	LR	0.88	0.46	2.98
153CNR	Anderson Seeds	1.5	N	55.2	LR	69.7	S	47.3	LR	1.84	0.63	2.20
181CNR	Anderson Seeds	1.7	PI88788	50.7	LR	69.9	S	50.5	LR	1.03	0.62	5.61
191CNR	Anderson Seeds	1.9	N	44.1	LR	58.3	LR	49.8	LR	0.72	0.93	0.45
201CNR	Anderson Seeds	2.0	N	46.7	LR	82.5	S	17.2	MR	0.88	0.82	0.00
AG1802	Asgrow	1.8	PI88788	46.1	LR	88.1	S	33.2	LR	0.64	1.03	1.51
AG1906	Asgrow	1.9	N	47.4	LR	70.1	S	31.3	LR	0.68	0.60	3.08
AG2002	Asgrow	2.0	N	47.0	LR	69.3	S	24.3	MR	0.55	0.90	0.41
AG2107	Asgrow	2.1	PI88788	55.7	LR	90.6	S	36.4	LR	0.89	0.43	1.43
AG2108	Asgrow	2.1	N	37.9	LR	72.4	S	16.5	MR	0.98	0.51	1.93
AG2110	Asgrow	2.1	N	5.8	R	14.4	MR	101.7	S	0.74	0.71	0.14
RC1320	Croplan Genetics	1.3	PI88788	49.9	LR	79.2	S	25.5	MR	0.69	0.39	1.39
RC1700	Croplan Genetics	1.7	N	52.0	LR	70.8	S	25.2	MR	0.78	0.36	3.15
RC2068	Croplan Genetics	2.0	N	47.4	LR	63.6	S	18.5	MR	0.95	0.22	1.65
RC2100	Croplan Genetics	2.1	N	46.6	LR	66.0	S	27.4	MR	0.51	0.54	1.46
7186	G2 Genetics	1.8	N	3.8	R	10.9	MR	77.1	S	0.70	0.59	0.87
7211	G2 Genetics	2.1	N	1.7	R	19.3	MR	42.8	LR	0.49	0.57	0.00
7226	G2 Genetics	2.2	N	15.0	MR	31.8	LR	50.1	LR	0.41	0.71	0.04
8820RR	GCS	2.0	N	60.0	LR	60.8	S	20.3	MR	1.12	0.57	1.17
K-170RR/SCN	Kruger	1.7	N	70.0	S	82.4	S	69.1	S	1.22	0.56	0.88
K-201RR/SCN	Kruger	2.0	PI88788	53.6	LR	73.4	S	20.9	MR	0.98	0.59	2.39
K-204RR/SCN	Kruger	2.0	N	57.1	LR	80.0	S	37.1	LR	1.12	0.66	0.37
K-248RR/SCN	Kruger	2.4	N	58.6	LR	66.9	S	37.1	LR	0.62	0.75	2.34
K-167RR/SCN	KSC/Challenger	1.6	N	65.1	S	68.5	S	37.8	LR	0.83	0.68	0.25
K-189R/SCN	KSC/Challenger	1.8	N	57.8	LR	64.4	S	18.4	MR	0.68	0.64	0.14
K-228RR/SCN	KSC/Challenger	2.2	N	44.1	LR	75.3	S	16.2	MR	0.53	0.69	0.25
K-249RR/SCN	KSC/Challenger	2.4	N	40.9	LR	71.7	S	35.9	LR	1.24	0.51	1.97
E1958R	Latham	1.9	PI88788	50.4	LR	74.3	S	26.6	MR	0.54	0.26	2.89
L1738R	Latham	1.7	PI88788	45.9	LR	54.3	LR	35.7	LR	0.62	0.92	1.07
GR2233	Midwest Seed	2.2	N	16.6	MR	65.0	S	15.6	MR	0.76	1.11	2.05
M-190NRR	Mustang	1.9	N	54.4	LR	229.5	S	15.0	MR	0.55	0.58	0.56
M-194NRR	Mustang	1.9	N	53.1	LR	75.0	S	29.5	MR	1.24	0.68	1.49
M-209NRR	Mustang	2.0	N	48.1	LR	60.8	S	33.5	LR	0.66	1.03	6.26
M-217NRR	Mustang	2.1	N	50.0	LR	79.0	S	23.8	MR	0.77	0.47	0.48
S19-L7	NK		N	59.1	LR	72.3	S	11.9	MR	1.04	0.50	4.21
S22-C5	NK	2.2	N	47.1	LR	52.2	LR	76.5	S	0.72	0.49	3.41
S23-N7	NK	2.3	N	82.9	S	108.6	S	96.5	S	1.10	0.68	2.21
XR-2584	NK	2.4	N	35.3	LR	76.4	S	34.4	LR	1.17	0.89	0.96
2014NRR	North Star Genetics	2.0	N	50.4	LR	85.1	S	28.5	MR	0.50	0.74	2.01
7201	Nutech	2.0	N	64.9	S	59.3	LR	30.0	MR	0.88	0.86	2.09
7216	Nutech	2.1	N	49.1	LR	54.3	LR	28.2	MR	1.20	0.66	0.15
7222	Nutech	2.2	N	42.5	LR	51.4	LR	19.6	MR	0.62	0.75	3.99
NT-7193+RR/SCN	Nutech	1.9	PI88788	56.0	LR	63.5	S	26.0	MR	1.08	0.88	3.33
PB-1958NRR	PBR	1.9	N	42.9	LR	70.5	S	8.9	R	0.78	0.55	1.13
PB-2117NRR	PBR	2.1	N	29.9	MR	93.7	S	21.5	MR	1.01	0.74	1.47
PB-2207NRR	PBR	2.2	N	42.8	LR	61.1	S	29.5	MR	1.05	0.54	0.62
91Y91	Pioneer Brand	1.9	Peking	16.9	MR	46.8	LR	70.8	S	0.42	0.35	1.87
92Y20	Pioneer Brand	2.2	Peking	4.0	R	29.8	MR	115.4	S	0.33	0.32	0.55
92Y30	Pioneer Brand	2.3	N	31.2	LR	53.1	LR	26.7	MR	0.89	0.61	6.93
PB-1885NRR	Prairie Brand	1.8	PI88788	49.3	LR	96.7	S	30.9	LR	0.96	0.74	1.06
PB-2007NRR	Prairie Brand	2.0	N	49.6	LR	76.2	S	37.4	LR	0.88	0.53	0.55
PB-2058NRR	Prairie Brand	2.0	N	46.9	LR	64.3	S	28.2	MR	0.67	0.22	1.72
PB-2347NRR	Prairie Brand	2.2	N	42.1	LR	51.1	LR	23.0	MR	1.49	0.55	2.35
1832-4	Stine	1.8	PI88788	49.5	LR	86.6	S	28.7	MR	0.97	0.48	0.34
1932-4	Stine	2.0	PI88788	50.4	LR	68.4	S	18.3	MR	0.36	0.80	1.97
2032-4	Stine	2.0	PI88788	50.1	LR	93.2	S	28.2	MR	0.62	0.63	0.88
2062-4	Stine	2.0	N	49.3	LR	56.8	LR	26.5	MR	0.89	0.75	1.42
193NRR	Viking	1.9	Hart/887	35.7	LR	59.1	LR	16.6	MR	1.01	0.66	3.55
Freeborn	Minnesota AES	1.7	PI88788	21.3	MR	76.0	S	6.9	R	0.95	0.50	1.72
IA1022	Iowa AES	1.8	PI88788	11.2	MR	55.5	LR	13.4	MR	0.97	0.49	2.82
IA2088	Iowa AES	2.1	887/437	24.3	MR	58.1	LR	8.9	R	0.50	0.74	0.15
MN1011CN	Minnesota AES	1.0	PI88788	39.0	LR	90.7	S	8.2	R	1.24	0.44	4.63
MN1106CN	Minnesota AES	1.1	209/437	38.0	LR	93.6	S	9.0	R	0.76	0.48	1.71
MN1410	Minnesota AES	1.4	S	76.2	S	118.1	S	93.8	S	3.41	2.07	8.69
MN1701CN	Minnesota AES	1.7	PI88788	19.8	MR	62.9	S	1.6	R	0.70	1.05	5.25
MN1204RRCN	Minnesota AES	0.2	PI88788	27.1	MR	53.3	LR	1.7	R	0.78	0.32	1.24

[1] The information of source of resistance was provided by companies. N = no data provided. IS = insufficient seed to test. 209/437 = PI209332 and/or PI437654, 887/209 = PI88788 and/or PI209332. S = susceptible.

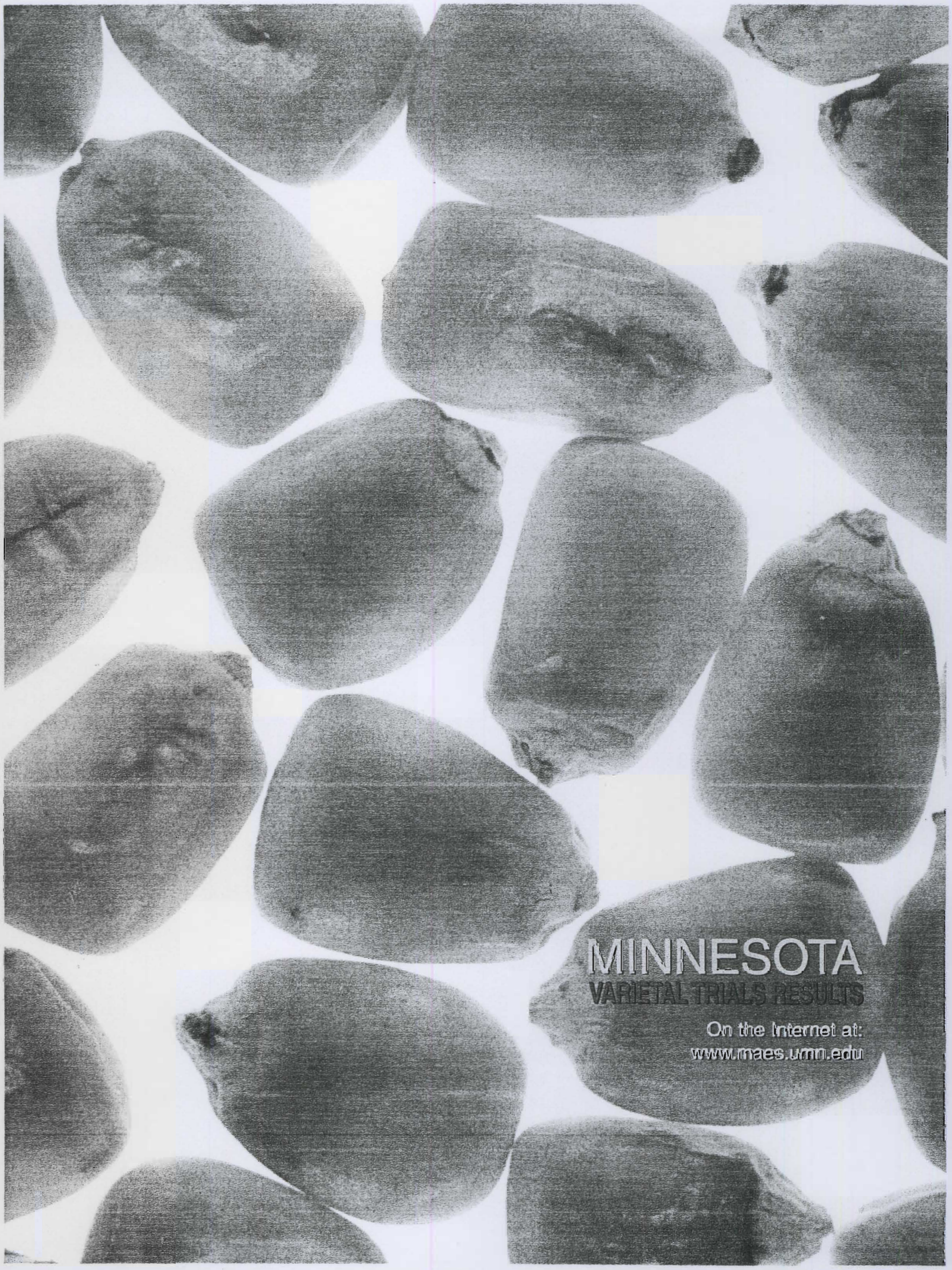
[2] SCN resistance rating: R = resistant at FI 10% or less; MR = moderately resistant at FI 11-30%; LR = low resistant at FI 31-60%; S = susceptiple at FI >60%.

Planting Rate and Date

Rates are based on seed of normal size and good quality and normal seedbed. Actual rates used will vary widely, depending on seed cost, desired stand, expected mortality, emerging ability, seed weight, seed germination, seedbed condition, depth of planting and planting equipment.

Crop	Bushel Weight (Pounds)[1]	Seeds / Pound (Number)	Rate / Acre (Pounds)	Rate (Seeds)	Planting Date
Barley	48	14,300	85	28 / sq. ft.	Early spring
Corn	56	—		33,000 / acre	April 15 / May 5
Fieldbean					
Black turtle soup	60	2,300	45	105,000 / acre	May 20 / June 15
Great northern	60	1,000	100	90,000 / acre	May 20 / June 15
Kidney	60	900	90-115	90,000 / acre	May 20 / June 15
Navy	60	2,500	42	105,000 / acre	May 20 / June 15
Navy, rows 6 to 14 in.	60		60	150,000 / acre	May 20 / June 15
Pinto	60	1,300	80	90,000 / acre	May 20 / June 15
Small red	60	1,400	75	100,000 / acre	May 20 / June 15
Small white	60	3,000	35	105,000 / acre	May 20 / June 15
Flax	56	88,000	42	85 / sq. ft.	April 15 / May 15
Forage grasses, perennial					
Bromegrass alone	14	136,000	16	50 / sq. ft.	Early spring or late summer
Bromegrass in mixtures			5	15 / sq. ft.	Use date for legumes
Orchardgrass, alone	14	653,000	10	150 / sq. ft.	Early spring or late summer
Orchardgrass, in mixtures			3	45 / sq. ft.	Use date for legumes
Reed canarygrass alone	46	526,000	7	85 / sq. ft.	Early spring or late summer
Reed canarygrass, in mixtures			5	60 / sq. ft.	Use date for legumes
Tall fescue, alone	25	229,000	15	75 / sq. ft.	Early spring or summer
Tall fescue, in mixtures			5	20 / sq. ft.	Use date for legumes
Timothy	45	1,234,000	3	85 / sq. ft.	Use date for legumes
Forage legumes, perennial					
Alfalfa alone	60	220,000	13	65 / sq. ft.	Late April-early May / Late June-early August
Alfalfa with grass			5 to 10	25 to 50 / sq. ft.	Late April-early May / Late June-early August
Alsike clover	60	653,000	2	30 / sq. ft.	Early spring to August 10
Birdsfoot trefoil alone	60	372,000	8	70 / sq. ft.	Early spring or summer
Birdsfoot trefoil in mixtures			6	50 / sq. ft.	Early spring or summer
Cicer milkvetch	60	122,000	18	50 / sq. ft.	Early spring or summer
Ladino clover	60	784,000	1	18 / sq. ft.	Early spring to August 10
Red clover alone	60	272,000	9	55 / sq. ft.	Early spring to September 1
Red clover with grass			5	30 / sq. ft.	Use date for legumes
Oat	32	16,200	80	28 / sq. ft.	Early spring
Rye	56	18,200	60	25 / sq. ft.	September 1
Sorghum, rows 18 to 40 in.	56	15,000	10	150,000 / acre	May 20 to June 5 for grain
Sorgrhum, rows 6 to 14 in.			15	5 / sq. ft.	
Soybean, 7-in. rows	60	2,800	56	2 / ft. of row	May 1 to May 10
10-in. rows				3 / ft. of row	
20-in. rows				6 / ft. of row	
22-in. rows				7 / ft. of row	
30-in. rows				9 / ft. of row	
Sunflower, nonoilseed	24	4,300	4	17,000 / acre	May 1—June 15
Sunflower, oilseed	27	7,700	3	23,000 / acre	May 1—June 15
Wheat, durum	60	12,100	90	25 / sq. ft	Early spring
Wheat, hard red spring[2]	60	14,000	113	28 / sq. ft	Early spring
Wheat, hard red winter	60	14,500	75+	25 / sq. ft	August 20 / September 20
Other Crops					
Annual canarygrass	50	58,000	30	40 / sq. ft.	Early spring
Buckwheat	48	14,000	50	17 / sq. ft.	June 15 / July 20
Canola, *B napus*	50	80,000 to 160,000	3 to 5	6 to 9	Early spring
Crambe	22	65,000	15	23 / sq. ft.	Late April / early May
Fieldpea	60	2,300	180	9 / sq. ft.	Early spring
Fieldpea with 1½ to 2 bu. oat			70	4 / sq. ft.	Early spring
Fababean, medium size	60	1,300	180	5 / sq. ft.	Early spring
Fababean, with 2 bu. oat			60	2 / sq. ft.	Early spring
Lentil, small	60	15,600	55	20 / sq. ft.	Early spring
Millet, foxtail	48	218,000	15	75 / sq. ft.	June 15 / July 15
Millet, proso	56	65,000	20	30 / sq. ft.	June 15 / July 15
Sudangrass, rows 6 to 14 in.	40	44,000	25	25 / sq. ft.	May 20 / June 10
Sweetclover	60	240,000	10	55 / sq. ft.	Early spring
Wildrice (wet)	25	7,900	35	6 / sq. ft.	Late fall

[1] U.S. legal bushel weight or, if not established, the weight most widely accepted. [2] See wheat section for best way to calculate hard red spring wheat planting rate.



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