

Minnesota

VARIETAL TRIALS RESULTS

MP106-2002 January 2002

Alfalfa, Barley, Birdsfoot Trefoil,
Bromegrass, Canola, Cicer Milkvetch,
Corn Grain, Corn Silage, Oat, Orchardgrass,
Red Clover, Reed Canarygrass, Soybean,
Tall Fescue, Timothy, Spring Wheat,
Winter Wheat and Wildrice



Minnesota
Agricultural
Experiment
Station

UNIVERSITY OF MINNESOTA

2002

JANUARY			FEBRUARY			MARCH																				
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S						
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JULY			AUGUST			SEPTEMBER																				
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The information in this miscellaneous publication of the Minnesota Agricultural Experiment Station (MAES) is presented under authority granted by the Hatch Act of 1887 to conduct performance trials on farm crops and interpret data to the public.

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Data in this publication are preliminary. A version of this report incorporating corrections, revisions and additions is

maintained on the MAES web site at <http://www.maes.umn.edu>. Electronic versions of some reports of past years on these and other crops can also be found there.

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By Charles C. Muscoplat

The University of Minnesota

Partnerships and Priorities Build the Future of Agriculture

The University of Minnesota has released about 100 varieties of fruits, more than 100 flowering plants and ornamentals, and more than 60 vegetable varieties since 1920. Notably, the Minnesota Agricultural Experiment Station (MAES) has supported the work of breeders within the College of Agricultural, Food and Environmental Sciences even longer. This is a strongly integrated partnership that can increasingly engage and support Minnesota citizens and help to better position the state for the future.

The College's partnership with MAES is important now more than ever as we work on the implementation phase of the College's new vision and priorities. The priorities were publicly presented in late October 2001 following about 18 months of grassroots involvement of faculty and staff members, students and citizens.

Particularly helpful were the comments and suggestions of the more than 400 citizens who joined us at "Listening Sessions" held at eight locations across the state. These priorities reflect the work that we do – work that is often significantly supported through MAES – that focuses on the issues of the day and the challenges that can affect quality of life for Minnesota citizens.

The College priorities are: *Promoting safe and healthy foods, improving environmental quality, enhancing agricultural systems, revitalizing Minnesota's rural communities and serving urban communities.* These five priorities are all bound by the overarching priority of *emphasizing exemplary education.* The objectives of the prioritization process were:

- To define ways that the College's contributions can best benefit the citizens of Minnesota, and
- To develop guidelines for making best use of the College's human, financial and physical resources.

What continues to drive the College's priority and implementation effort? Students, consumers and the changes that define agriculture in its broadest terms.

- **Students.** We are attentive to student trends: more than 50 percent now come from urban areas, and about 81 percent of our students pursue non-production agriculture degrees. About 65 percent are women.
- **Consumers.** Consumers are seeking information and the application of research that addresses bacterial contamination of food, the increased nutritional quality of foods, improved water quality, application of fertilizers and pesticides on yards and gardens, land use and management, and sustainable communities that are strengthened through the positive interactions of food, land and people.

Charles C. Muscoplat is Vice President and Dean
College of Agricultural, Food and Environmental Sciences

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- **Agricultural change.** The College continues to address the production of a wide range of commodities and horticultural crops, and the evaluation and application of appropriate technologies. It also must address issues within a rapidly expanding definition of agriculture: information- and technology-based market opportunities, new and value-added productions, ethics, the implications of population and income growth, electronic and on-line information and distance education, conservation of soil, water, atmospheric and biological resources; waste management issues and the rural/urban interface, to name but a few areas.

The priorities of the College dovetail with the goals of the MAES and its other partner colleges. Together we build on the agricultural traditions of the past while undertaking research that will help us all better address the future.

Historically, the MAES, established by the Minnesota legislature in 1885, pre-dates the national land grant university network created by the Congress in 1887. Today, as then, the MAES supports faculty research in the College that results in new knowledge to be shared with farm producers and all segments of the agricultural industry. This knowledge also informs the work of University of Minnesota Extension Service educators and those throughout the University who provide other outreach programs.

Whether the issues are improved flower, fruit, vegetable and crop varieties; soil and water quality; economic viability and agricultural productivity; or quality food supply, the integrated work of the MAES and the College will support the citizens of Minnesota toward sustainable futures for their families and their communities.



The College of
**Agricultural, Food and
Environmental Sciences**

Knowledge for a changing world

Minnesota

VARIETAL TRIALS RESULTS

Successful crop production depends on selecting varieties best adapted to a specific area. To provide comparative information the Minnesota Agricultural Experiment Station compares varieties in trial plots at St. Paul, Becker, Crookston, Grand Rapids, Lamberton, Morris, Rosemount, St. Paul and Waseca, and on farmers' fields. Crop varieties are grown in replicated plots at each location and factors affecting yield and other characteristics are as nearly the same for all varieties at each location as is possible.

Some crops and crop varieties included in previous editions of *Minnesota Varietal Trials Results* are not included in 2001 performance trials. Questions about them can be addressed to the logical individual listed under the "Authors and Researchers" heading on page 7.

Variety Classifications

Varieties of barley, oat, hard red spring wheat and winter wheat are classified into groups under "General Purpose Varieties" "Special-Purpose Varieties" and "Varieties Not Adequately Tested" headings.

General-Purpose Varieties designates varieties that have been adequately tested three years or more and generally are not grown for a specific special purpose.

Special-Purpose Varieties designates adequately tested varieties that have specific attributes that differentiate them from general-purpose varieties or are intended for a specific end use.

Varieties Not Adequately Tested designates varieties that may be new or were previously tested but have not been evaluated over the past three consecutive years.

Seed of varieties in all these groups may be eligible for certification. 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 growers in the Minnesota Crop Improvement Association listing beginning on page 83.

Interpreting the Tables

The LSD (least significant difference) figures 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 differences 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.

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

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.

Rate and Date of Planting

This information is given for each crop; in all cases the planting rate is based on normal seedbeds and normal size, good quality seed. The seeding rate used can vary greatly, depending on seed cost, desired stand, expected mortality, ability to emerge, seed weight, seed germination, seedbed condition, depth of planting and planting equipment. The bushel weight given is generally accepted in the United States.

Financial Support

The Minnesota Agricultural Experiment Station acknowledges with deep appreciation the continued generous financial support of the Minnesota Approved Seed Conditioners and Marketing Association and the former oat and soybean grower members of the Minnesota Seed Producers and Promotion Association, which for many years marketed public varieties under the MPS Seed brand. Their contributions make possible the free distribution of this report.

Cooperation

The Experiment Station appreciates the cooperation of the following organizations in the distribution of the 2002 edition of *Minnesota Varietal Trials Results*:

Minnesota Barley Growers Association and Minnesota Barley Council

Minnesota Canola Council

Minnesota Corn Growers Association and Minnesota Corn Research and Promotion Council

Minnesota Forage and Grassland Council

Minnesota Soybean Growers Association and Minnesota Soybean Research and Promotion Council

Minnesota Association of Wheat Growers and Minnesota Wheat Council

The Minnesota Crop Improvement Association is especially helpful through its overall coordination of the publication and distribution of this report.

A consolidated chart of planting rates and dates is on page 95.

Plant Variety Protection

PVP Barley, oat and wheat varieties covered by the U.S. Plant Variety Protection Act are identified by the PVP symbol. When the symbol is followed by (94) seed of that variety may not be sold by a producer, not even to a relative or neighbor, without express permission of the variety's developer/owner. When the symbol is followed by (pending) the variety should be considered as having PVP (94) protection.

Abbreviations

For the sake of economy in variety descriptions and some other listings, the abbreviation "AES" is generally used for agricultural experiment station.

Authors and Researchers

Authors of the crops section are:

Alfalfa: P.R. Peterson, C.C. Sheaffer, D.A. Schriever, D. Swanson.

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Corn Grain: T.R. Hoverstad, D.R. Hicks, G.A. Nelson, S.R. Quiring, M. Weins.

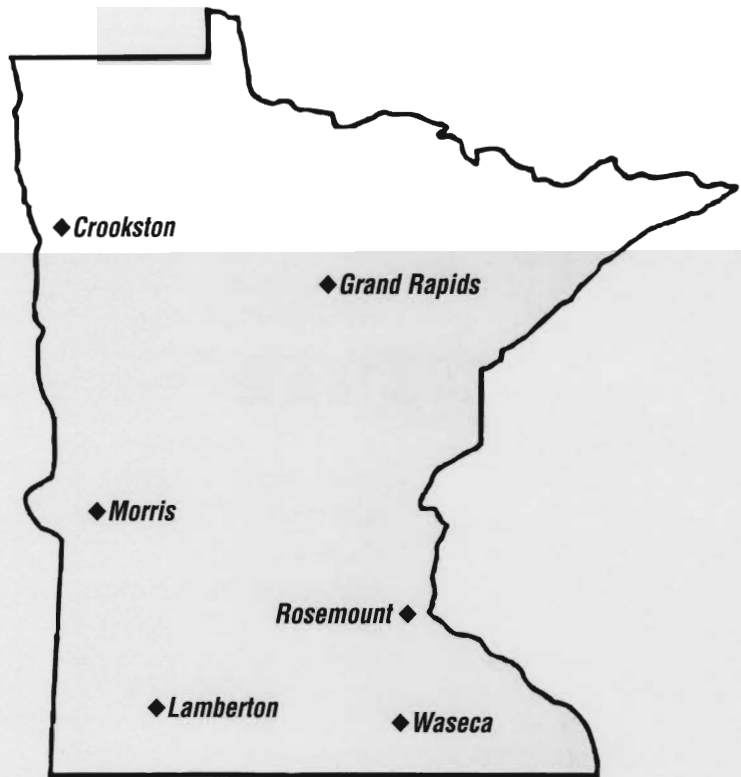
Corn Silage: C.C. Sheaffer, D.R. Swanson, T.R. Hoverstad, J.L. Halgerson, D.R. Hicks.

Oat: D.D. Stuthman, R.A. Caspers, R.P. Halstead.

Soybean: J.H. Orf, L.L. Hardman, P.J. Schaus, A. Killam.

Wheat: J.A. Anderson, G.L. Linkert, L.M. Matthiesen, Jochum Wiersma.

Wildrice: R. A. Porter.



University of Minnesota Research and Outreach Center Locations.

Information on the reaction of crop varieties to specific pathogens was obtained mainly by J.E. Kurl and R. Dill-Macky, Department of Plant Pathology; D.V. McVey and G. Ochocki, USDA-ARS Cereal Disease Laboratory, Gary Hareland, USDA-ARS Wheat Quality Laboratory, Fargo; and F. Kolb, University of Illinois - Urbana. Plotwork supervisors included R. D. Mathison, G.A. Nelson, W.G. Thompson, J.J. Wieresma and J.V. Wiersma.

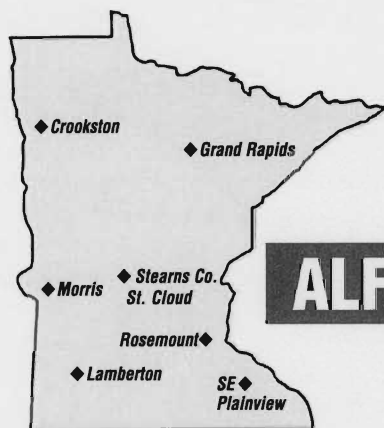
Publication Supervisor: Leland L. Hardman.

Photography: David L. Hansen

Overall Coordination: Beverly R. Durgan and the Minnesota Crop Improvement Association.



FORAGE CROPS



Locations of Alfalfa Trials.

Alfalfa Data Sources, Selection

Successful alfalfa production depends on selecting the best varieties for a particular farm. Varieties have been compared for yield in trial plots on Minnesota Agricultural Experiment Station fields: yearly at Rosemount, and alternate years at the other locations. The trials are conducted using recommended fertility and pest control practices to optimize yield and persistence.

Test results from new and previous seedings of varieties currently available in Minnesota are published as accumulated performance years averaged as a percent of check varieties. Test locations are representative of the risk of winter injury in specific regions of Minnesota – southeast: Rosemount and Waseca (replaced by Lewiston in 1996, Plainview/Potsdam in 1998); southwest: Lamberton; west-central: Morris and Stearns County (St. Martin, Melrose) since 1998; northwest: Crookston (to 1995) and northeast: Grand Rapids (see locations map above). Varieties of alfalfa are tested for winter survival index (WSI) and forage quality at selected experiment stations of the Universities of Minnesota and Wisconsin-Madison.

Early each fall alfalfa developers and marketers who have provided current contact addresses are asked to declare

which varieties approved for seed certification will be marketed in Minnesota for the next seeding year. The varieties reported in those responses are listed on pages 16-19; each variety is keyed to distributors' addresses and telephone numbers on pages 20-21. Varieties seeded in past or present Minnesota yield trials are included on pages 10-13; those with winter survival or forage quality performance data are listed on pages 14-15.

ALFALFA

Winterhardiness and Winter Survival Index

Severe winters make winterhardiness a primary consideration in variety selection for most areas of Minnesota. The greatest winterhardiness is needed in the west central and northwest Minnesota area (see winter injury potential map). Because of the high frequency of severe winters in this area, only varieties with very good winter survival should be selected. The east central and southeast areas also experience severe winters frequently. The southwest area seldom experiences severe winter injury because of dry soils, high soil potassium levels and neutral soil pH. The northeast area seldom experiences severe winter injury because of dependable snow cover.

Winterhardiness of varieties is extremely 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. A standardized test, the North American Alfalfa Improvement Conference (NAAIC) Winter Survival Test, measures the survival of a variety after a severe winter. Tests conducted annually at four or five locations (Arlington, Lancaster and Marshfield, Wis.; and Rosemount and Morris, Minn.) are the basis for the winter survival index (WSI) on page 14.

The WSI for each tested variety was averaged over all test locations to provide

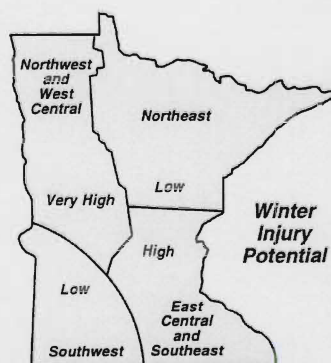
a robust estimate of winterhardiness and is presented beside yield data in on pages 10-13. Varieties are rated from superior (1) to adequate (4) in winter survivability. Vernal, a traditional winterhardy variety is rated superior. Varieties rated adequate in winter survivability are expected to be injured the most after a severe winter. All varieties tested to date have rated above adequate. If a variety does not have a WSI, (company has not entered variety in Winter Survival trial) the fall dormancy index is the next best indicator of winterhardiness: (1 = very winterhardy; 2 = winterhardy; 3 and 4 = moderately winterhardy).

Fall Dormancy

Fall dormancy ratings are shown on pages 16-19, with varieties listed alphabetically. Fall dormancy ratings describe the relative amount of fall growth of alfalfa varieties. Very fall-dormant varieties have little fall growth and are slow to recover after cutting. Fall-dormant varieties are adaptable to all areas of the state. Moderately fall-dormant varieties produce good fall growth, are characterized by rapid recovery after harvest, and usually reach 1/10 bloom several days earlier than more dormant varieties. Although increased fall dormancy has traditionally been associated with greater winter survival, the WSI is now considered a better predictor of winter survival

Forage Yield

Yields of alfalfa varieties currently tested and/or reported by respondents as cur-



rently marketed in Minnesota are shown on pages 10-13. Yields are expressed as a percentage of check varieties, for example, 113 means the variety had 13% greater yield than the check varieties. Varieties are ranked according to their average performance in *harvest years after the seeding year* across ALL locations in which they have been tested; first by the average of year-1 and year-2 yields, then by year-3 yield, then by year-1 yield. Variety performance is also aggregated regionally as SE (southeast): Rosemount+Plainview; WC (west-central): Morris+Stearns County; SW (southwest): Lamberton, and NE (northeast): Grand Rapids.

Greatest confidence should be placed in data that includes three or more tests for a particular variety. Each seeding at any location is considered a "test." Each yield number in the table has been formatted to reveal how many tests it represents. **Bold** type yield data indicates that the variety has been in three or more tests, regular type indicates two tests, and *italic* type indicates only one test.

Varietal differences in yield tend to increase with stand age. Thus, to choose a variety for short-term stands, use the ALL-location yield for years 1+ 2. For long-term stands, choose varieties based on their performance through year 3.

Forage Quality

While maturity is the greatest determinant of forage quality or feeding value of alfalfa, varieties also differ. A NAAIC-Standardized Forage Quality Test has been performed at Arlington, Wis., and Rosemount, Minn., since 1995. Relative forage quality of alfalfa varieties tested in Minnesota and Wisconsin from 1996 to 2000 and in 2001 is shown on page 15. Data are expressed as milk per ton of forage and milk per acre.

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 MILK2000, 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 the milk produced per ton of forage DM provides an estimate of the milk produced per acre and combines yield and quality into a single term.

In the seeding year, varieties are evaluated on one or two cuts taken in July and/or late August. Production year evaluation (first year after seeding only) is done by analyzing each of three cuttings taken at late bud to 1/10-bloom stages of maturity.

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. Plant resistance is available for all six diseases. The variety resistance ratings for each disease are presented on pages 16-19. 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 for moderately fall-dormant varieties to have at least (R) levels of disease resistance to stay productive for more than two years after the seeding year under intensive management (four cuts/season) in the east central and southeast areas of Minnesota.

Bacterial Wilt – This disease is prevalent in most areas of the state. Wilt-susceptible varieties are poor risks and should not be grown. They generally show losses in stand by the end of the second year after seeding. In some cases where infection is severe, stand losses are often observed by the end of the first

year after seeding. Stand reductions after winter are often due to a combination of wilt damage and winter injury.

Phytophthora Root Rot – This fungal disease is a major concern on poorly drained soils especially in the east central and southeast area of the state. It can cause stand losses of seedlings, and can contribute to lower productivity in older stands if the soil remains wet for a week or more.

Fusarium Wilt – The fungus that causes Fusarium wilt is present in most soils. It contributes to stand decline mainly in combination with other disease organisms. Therefore, resistance to Fusarium wilts in addition to resistance to both bacterial wilt and Phytophthora root rot contributes to longer stand life.

Anthracnose – This fungus disease was first found in Minnesota in 1978 and has become more prevalent each year, but only in the east central and southeast area. It infects stems and crowns and kills susceptible plants. The disease is favored by hot, moist conditions, and will therefore be most frequently observed in southeast Minnesota.

Verticillium Wilt – This potentially destructive fungus disease was first found in several eastern Minnesota fields in 1981. It has usually been found in 2- or 3-year-old fields, and its spread in the state has been slow. Planting resistant varieties will help provide insurance for long-life stands. Varieties having at least a low level of resistance are indicated on pages 16-19.

Aphanomyces Root Rot – This disease is associated with very slowly drained soils and is easily confused with Phytophthora root rot. It stunts and kills seedlings as well as causing a chronic root disease in established plants. Few cases of this disease have been identified in Minnesota. Consider planting a variety with Aphanomyces resistance if Phytophthora-root-rot-resistant varieties fail to persist.

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. Since blends may have been derived in various ways, their performance depends on the skill and integrity of the seed company. Disease resistance, winter survival and other characteristics may change within a blend from lot to lot or year to year. Therefore, using *certified* seed of adapted, high-yielding varieties best assures true-ness to name.

The web version of this report is on the Minn. Agricultural Experiment Station website:

www.maes.umn.edu/pubs.html

The full version of the yield table, which shows the number of tests and regional year-1 data, is posted at the University of Minnesota-Agronomy FORAGES website:

www.agro.agri.umn.edu/forages

Alfalfa Planting Rate and Date

Bushel Weight, Pounds	60
Seeds/Pound.....	220,000
Planting Rate, Pounds/Acre	
Alone	11
With Grass.....	7
Planting Rate, Seeds Sq.Ft.	
Alone	55
With grass	35
Planting Date	Early Spring, Late Summer

Alfalfa yield as percent of checks and winter survival index (WSI) at ALL and regional sites.

(**Bold** type yield numbers represent 3 or more tests¹, regular type: 2 tests, *Italic* type: only 1 test².)

Variety, ranked by Year 1 + Year 2 Average, Year 3, Year 1	WSI ²	Average Yield for Years 1, 1+2, 3 After Seeding Year ⁴										
		ALL ³			SE ³		WC ³		SW ³		NE ³	
		Yr 1	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3
Checks, T/Acre 15%mc Hay		5.97	5.48	5.88	6.24	6.31	5.84	5.94	5.54	6.35	3.79	4.10
Perfect	-	<i>115</i>	<i>112</i>	<i>128</i>	-	-	<i>112</i>	<i>128</i>	-	-	-	-
Persist	-	110	112	118	112	120	116	116	105	-	-	-
Laser	-	111	112	<i>102</i>	<i>115</i>	<i>102</i>	<i>117</i>	-	<i>103</i>	-	-	-
Badger	-	<i>110</i>	<i>111</i>	<i>114</i>	<i>111</i>	<i>114</i>	-	-	-	-	-	-
Abundance	3.4	111	111	<i>107</i>	111	<i>107</i>	-	-	-	-	-	-
WinterMax	-	111	111	<i>105</i>	<i>111</i>	-	111	<i>105</i>	-	-	-	-
MultiQueen	-	117	111	-	-	-	<i>127</i>	-	<i>102</i>	-	-	-
HybriForce-400	-	109	110	<i>117</i>	110	<i>117</i>	-	-	-	-	-	-
Paragon BR	-	<i>111</i>	<i>110</i>	<i>116</i>	<i>110</i>	<i>116</i>	-	-	-	-	-	-
Magnum III	-	109	110	114	110	110	106	103	116	132	<i>104</i>	<i>108</i>
Standout	-	110	110	112	-	-	<i>113</i>	<i>115</i>	<i>106</i>	<i>110</i>	-	-
9326	-	110	110	110	112	<i>98</i>	115	119	101	<i>105</i>	-	-
Root 66	2.1	<i>107</i>	<i>110</i>	<i>109</i>	<i>110</i>	<i>109</i>	-	-	-	-	-	-
Stampede	-	109	110	<i>104</i>	110	<i>104</i>	-	-	-	-	-	-
MagnaGraze	-	111	110	<i>101</i>	110	<i>101</i>	-	-	-	-	-	-
Magnum III-Wet	-	110	110	101	110	101	<i>111</i>	-	-	-	-	-
Quantum	-	114	110	<i>99</i>	107	<i>99</i>	<i>118</i>	-	-	-	-	-
Radiant	-	<i>108</i>	<i>109</i>	<i>117</i>	<i>109</i>	<i>117</i>	-	-	-	-	-	-
Surpass	-	109	109	107	111	<i>107</i>	<i>106</i>	<i>104</i>	-	-	<i>108</i>	<i>110</i>
Voyager II	-	109	109	104	109	<i>101</i>	<i>108</i>	<i>105</i>	<i>109</i>	<i>105</i>	-	-
Rebound 4.2	2.4	108	108	121	<i>110</i>	-	111	120	103	122	-	-
GoldLeaf	3.0	112	<i>108</i>	<i>113</i>	<i>108</i>	<i>113</i>	-	-	-	-	-	-
Monument	-	103	108	113	109	<i>118</i>	<i>111</i>	<i>128</i>	<i>100</i>	<i>104</i>	<i>110</i>	<i>102</i>
Vitro	2.6	108	108	112	<i>113</i>	<i>118</i>	105	110	-	-	-	-
Harvstar 812Hyb	-	<i>110</i>	<i>108</i>	<i>111</i>	<i>108</i>	<i>111</i>	-	-	-	-	-	-
Spirit	-	105	108	110	112	-	<i>108</i>	<i>103</i>	<i>106</i>	<i>117</i>	-	-
Gateway	-	111	108	109	107	<i>107</i>	<i>109</i>	<i>112</i>	-	-	-	-
631	-	108	108	109	107	109	115	<i>108</i>	101	<i>109</i>	-	-
Geneva	2.8	107	108	108	108	109	<i>104</i>	<i>105</i>	110	<i>110</i>	-	-
Target II Plus	-	109	108	107	109	106	<i>106</i>	<i>109</i>	-	-	-	-
Prolific	-	<i>108</i>	<i>108</i>	<i>107</i>	<i>108</i>	<i>107</i>	-	-	-	-	-	-
BigHorn	3.1	107	108	105	105	98	<i>114</i>	<i>125</i>	-	-	-	-

¹ Each seeding in any location counts as one "Test". Test data from experimental seed is retired as data from tests on commercial seed are sufficient to replace it.

² Winter Survival Index: 1=superior, 2=very good, 3=good, 4=adequate, 5=low 6=none. WSI is from joint Minnesota-Wisconsin 1996-2001 trials (Page 14 is 2001 WSI data only).

³ Locations: SE (southeast), Rosemount+Plainview; WC (west-central), Morris+Stearns County; SW (southwest), Lamberton; NE (northeast), Grand Rapids.

⁴ The full version of this table, with regional and year-1 data, is posted at the UM-Agronomy FORAGES website: www.agro.agri.umn.edu/forages

Alfalfa yield as percent of checks and winter survival index (WSI) at ALL and regional sites.

(**Bold** type yield numbers represent 3 or more tests¹, regular type: 2 tests, *Italic* type: only 1 test².)

Variety, ranked by Year 1 + Year 2 Average, Year 3, Year 1	WSI ²	Average Yield for Years 1, 1+2, 3 After Seeding Year ⁴										
		ALL ³			SE ³		WC ³		SW ³		NE ³	
		Yr 1	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3
620 -Garst	2.5	109	108	104	108	105	108	100	103	107	-	-
Magnum IV	-	107	108	104	108	104	-	-	-	-	-	-
Extend	2.9	108	108	99	108	<i>101</i>	-	-	-	-	<i>108</i>	<i>98</i>
Pointer	-	109	108	-	<i>111</i>	-	<i>110</i>	-	<i>100</i>	=	=	=
Forecast 3001	3.1	108	108	-	<i>105</i>	-	<i>110</i>	-	-	-	-	-
A4230	-	107	<i>107</i>	<i>117</i>	<i>107</i>	<i>117</i>	-	-	-	-	-	-
Magnum V	3.0	103	107	114	106	108	110	117	104	120	-	-
Alliant	3.0	112	<i>107</i>	<i>113</i>	<i>106</i>	<i>113</i>	-	-	-	-	-	-
350 -ABT	2.8	108	107	113	111	<i>113</i>	104	<i>113</i>	-	-	-	-
Somerset	2.5	105	107	<i>112</i>	107	<i>112</i>	-	-	-	-	-	-
Rebel	-	108	107	109	-	-	<i>108</i>	<i>104</i>	106	113	-	-
Innovator+Z	2.3	105	107	109	107	103	120	124	94	105	-	-
FQ 315	-	109	107	108	108	<i>100</i>	106	<i>117</i>	-	-	-	-
Jade II	-	106	107	108	107	108	-	-	<i>107</i>	<i>109</i>	-	-
AlfaStar	-	113	107	106	<i>104</i>	<i>110</i>	-	-	108	102	-	-
Baralfa 32 IQ	3.0	108	107	105	103	105	119	106	-	-	-	-
5454	2.3	107	107	105	108	105	111	111	102	99	105	102
Imperial	-	107	107	105	107	107	<i>108</i>	<i>102</i>	-	-	-	-
WL 325 HQ	-	107	107	105	110	<i>121</i>	109	102	95	-	<i>110</i>	<i>96</i>
Columbia 2000	3.1	108	107	104	105	<i>101</i>	<i>110</i>	<i>110</i>	<i>109</i>	<i>112</i>	<i>105</i>	<i>93</i>
TMF 421	-	108	107	104	<i>103</i>	<i>94</i>	112	108	108	<i>106</i>	100	-
WL 324	-	107	107	103	107	-	108	108	-	-	<i>104</i>	<i>92</i>
AmeriStand 201+Z	2.0	105	107	103	108	103	108	103	103	<i>105</i>	-	-
Defiant	2.3	108	107	102	108	<i>104</i>	<i>105</i>	<i>95</i>	<i>107</i>	<i>106</i>	-	-
FQ 314	3.0	106	107	102	106	100	109	<i>107</i>	-	-	-	-
Green Feast	2.9	<i>111</i>	<i>107</i>	<i>101</i>	<i>107</i>	<i>101</i>	-	-	-	-	-	-
Mariner	-	111	107	101	105	<i>104</i>	-	-	-	-	<i>111</i>	<i>98</i>
Forecast 1001	2.9	107	107	-	<i>111</i>	-	<i>102</i>	-	-	-	-	-
WL 327	-	106	107	-	<i>111</i>	-	<i>101</i>	-	-	-	-	-
Garst 645	2.8	107	106	112	106	104	108	111	104	119	-	-
Enhancer	-	106	106	111	107	108	-	-	<i>105</i>	<i>116</i>	-	-
Bounty	-	107	106	108	104	109	<i>110</i>	<i>108</i>	-	-	-	-
Dominator	-	107	106	<i>108</i>	108	<i>108</i>	-	-	99	-	-	-
DK142	-	106	106	108	106	108	-	-	-	-	-	-
Rustler II	-	108	106	107	104	<i>105</i>	<i>111</i>	<i>110</i>	-	-	-	-
Forecast 3000	-	104	106	107	-	-	<i>103</i>	<i>99</i>	<i>110</i>	<i>115</i>	-	-
DK140	2.8	106	106	106	106	108	110	107	101	95	100	-
Notice	2.6	106	106	104	<i>104</i>	<i>103</i>	<i>111</i>	<i>104</i>	<i>102</i>	<i>105</i>	-	-
WinterGold	2.6	106	106	104	104	99	108	<i>109</i>	-	-	-	-
A-395	-	107	106	103	105	<i>101</i>	<i>106</i>	<i>101</i>	<i>107</i>	<i>107</i>	-	-
WinterStar	2.4	107	106	103	104	<i>103</i>	108	101	<i>107</i>	<i>111</i>	104	-
Evolution	-	107	106	100	111	<i>101</i>	<i>105</i>	<i>95</i>	-	-	<i>98</i>	<i>105</i>
Iroquois	-	104	106	99	104	98	106	<i>102</i>	<i>100</i>	<i>99</i>	111	96
5312 - check	3.0	105	105	105	107	110	104	101	104	99	104	107
A 30-06	1.9	104	<i>105</i>	<i>115</i>	<i>112</i>	<i>115</i>	-	-	92	-	-	-
Yielder	-	100	<i>105</i>	<i>107</i>	<i>105</i>	<i>107</i>	-	-	-	-	-	-
Rainier	2.9	105	105	106	105	108	108	<i>106</i>	103	<i>108</i>	100	<i>98</i>
Mahnslay	2.7	104	105	105	105	105	-	-	-	-	-	-
WinterKing	2.5	107	105	104	104	99	107	104	<i>109</i>	<i>114</i>	99	-
WL 232 HQ	-	106	105	104	<i>109</i>	<i>108</i>	104	100	<i>103</i>	<i>108</i>	-	-

Alfalfa yield as percent of checks and winter survival index (WSI) at ALL and regional sites.

(**Bold** type yield numbers represent 3 or more tests¹, regular type: 2 tests, *italic* type: only 1 test².)

Variety, ranked by Year 1 + Year 2 Average, Year 3, Year 1	WSI ²	Average Yield for Years 1, 1+2, 3 After Seeding Year ⁴										
		ALL ³			SE ³		WC ³		SW ³		NE ³	
		Yr 1	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3
Breakout	2.5	105	105	104	105	104	–	–	–	–	104	–
GH787	–	107	105	103	105	105	–	–	–	–	109	98
329 ~Max	–	111	105	100	106	99	–	–	–	–	103	101
UltraLac	–	105	105	–	105	–	–	–	–	–	–	–
6410 ~Garst	2.7	106	104	122	110	122	90	–	98	–	–	–
Platinum	–	101	104	117	107	117	–	–	99	–	–	–
WinterGreen	2.5	105	104	112	107	112	–	–	–	–	100	–
Abound	2.5	107	104	111	104	111	103	–	100	–	–	–
9429	2.8	106	104	108	107	99	107	118	96	–	–	–
AmeriGraze 401+Z	–	102	104	107	101	102	114	117	–	–	–	–
Feast+EV	2.2	105	104	106	104	107	104	105	–	–	–	–
GH757	3.1	103	104	106	104	106	–	–	–	–	–	–
Sterling	–	106	104	105	102	104	111	111	99	100	–	–
GH766-QP	–	103	104	105	106	100	101	108	108	108	105	98
DK141	3.4	106	104	104	103	101	109	106	107	109	89	–
DK124	2.7	105	104	104	104	99	106	107	100	105	103	–
DK127	2.7	105	104	104	105	107	103	103	97	103	110	95
Magnum V-Wet	3.3	105	104	104	105	104	–	–	–	–	–	–
Multi 5301	–	103	104	104	102	101	103	107	107	106	–	–
WetLand	–	105	104	102	103	102	106	–	–	–	–	–
Viking 1	3.0	104	104	101	107	101	105	99	94	96	112	106
Nemesis	–	103	104	101	104	105	107	97	100	97	–	–
Ace	3.1	102	104	101	101	95	113	113	–	–	–	–
630	–	97	104	101	–	–	104	101	–	–	–	–
Affinity+Z	–	102	104	100	104	101	–	–	–	–	104	100
Hunter	–	105	104	99	103	99	–	–	–	–	–	–
54V54	2.5	108	104	–	110	–	101	–	93	–	–	–
Reliance	–	100	103	120	103	120	–	–	–	–	–	–
Depend+EV	–	105	103	114	102	98	–	–	–	–	103	130
53V08	–	105	103	113	–	–	103	110	104	117	–	–
53Q60	3.0	104	103	108	105	105	104	108	103	114	99	–
GH767	3.0	105	103	104	103	104	–	–	–	–	–	–
Complete	2.7	104	103	104	106	103	–	–	99	106	–	–
Pristine	–	102	103	104	103	104	–	–	–	–	–	–
LegenDairy 2.0	2.8	107	103	103	98	99	113	106	–	–	–	–
Multi 5302	–	105	103	102	–	–	104	95	101	108	–	–
Avalanche+Z	2.4	103	103	102	109	100	99	106	95	107	100	94
Award	3.3	105	103	101	103	101	94	–	99	–	112	101
Wrangler	–	102	103	101	106	107	106	103	98	106	100	91
Multiplier II ~TMF	–	105	103	100	101	96	109	105	104	101	100	96
Spur	–	105	103	99	103	99	–	–	–	–	–	–
Sprint	2.6	101	103	99	105	99	99	–	–	–	–	–
Legend Gold	–	103	103	96	107	96	102	–	95	–	–	–
645-II ~Garst	–	108	103	–	–	–	–	–	99	–	–	–
Samurai	–	103	103	–	103	–	–	–	–	–	–	–
Emperor	2.6	99	102	109	102	109	–	–	–	–	–	–
Gold Plus	–	102	102	105	101	103	106	109	–	–	–	–
Oneida-ck	–	104	102	104	102	103	103	102	98	106	106	108
Ranger	3.0	102	102	102	100	101	125	117	97	99	–	–
53V63	2.8	105	102	96	99	97	107	95	100	98	101	–

Alfalfa yield as percent of checks and winter survival index (WSI) at ALL and regional sites.

(**Bold** type yield numbers represent 3 or more tests¹, regular type: 2 tests, *Italic* type: only 1 test².)

Variety, ranked by Year 1 + Year 2 Average, Year 3, Year 1	WSI ²	Average Yield for Years 1, 1+2, 3 After Seeding Year ⁴										
		ALL ³			SE ³		WC ³		SW ³		NE ³	
		Yr 1	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3	Yr 1+2	Yr 3
NetYield 500	2.9	100	102	—	102	—	—	—	—	—	—	—
GH750	—	106	101	108	102	108	104	—	93	—	—	—
Rhino	—	104	101	108	99	106	105	111	—	—	—	—
MP2000	2.7	102	101	108	103	108	107	113	94	105	—	—
9111	—	101	101	108	—	—	100	107	102	110	—	—
Lactator	3.1	102	101	104	101	104	—	—	—	—	—	—
205 -ABT	1.6	103	101	102	101	103	105	102	94	100	100	102
Empire	—	103	101	100	99	97	105	103	95	98	102	—
Milk River	—	105	101	—	103	—	98	—	95	—	—	—
AC Viva	—	100	101	—	104	—	—	—	98	—	—	—
Oneida VR-check	—	100	100	101	103	104	100	103	95	96	101	96
Vernal-check	1.9	100	100	100	100	100	99	99	102	99	100	100
Mariner II	—	97	100	100	100	100	—	—	—	—	—	—
400 SCL -ABT	—	102	100	84	100	84	—	—	—	—	—	—
Agate	—	98	99	106	101	110	97	101	100	100	89	96
Spredor 3 -check	1.8	99	98	98	97	94	103	100	102	105	96	100
Guardian	3.0	99	98	104	109	110	98	104	87	97	—	—
Banquet	—	101	96	96	97	99	—	—	—	—	95	94
Ameriguard 302+Z	—	93	95	—	—	—	—	—	95	—	—	—
DK134	2.6	115	—	—	—	—	—	—	—	—	—	—
Monument II	—	114	—	—	—	—	—	—	—	—	—	—
Arrow Head	—	113	—	—	—	—	—	—	—	—	—	—
Ascend	—	112	—	—	—	—	—	—	—	—	—	—
Baralfa 42 IQ	2.3	112	—	—	—	—	—	—	—	—	—	—
Multiplier 3 -TMF	2.8	111	—	—	—	—	—	—	—	—	—	—
Phabulous	—	110	—	—	—	—	—	—	—	—	—	—
Defense+EV	—	109	—	—	—	—	—	—	—	—	—	—
Good as Gold II	—	109	—	—	—	—	—	—	—	—	—	—
Phirst	—	109	—	—	—	—	—	—	—	—	—	—
Trophy	—	109	—	—	—	—	—	—	—	—	—	—
4200	—	108	—	—	—	—	—	—	—	—	—	—
Lightning II	—	108	—	—	—	—	—	—	—	—	—	—
Value Plus I	2.6	107	—	—	—	—	—	—	—	—	—	—
AmeriStand 403T	2.1	106	—	—	—	—	—	—	—	—	—	—
GH700	2.9	106	—	—	—	—	—	—	—	—	—	—
Ripin	—	106	—	—	—	—	—	—	—	—	—	—
4 Traffic	—	1 test	—	—	—	—	—	—	—	—	—	—
6420 -Garst	—	2 tests	—	—	—	—	—	—	—	—	—	—
8599	—	1 test	—	—	—	—	—	—	—	—	—	—
AV 3420	—	1 test	—	—	—	—	—	—	—	—	—	—
DKA42-15	2.4	2 tests	—	—	—	—	—	—	—	—	—	—
LegenDairy YPQ	—	1 test	—	—	—	—	—	—	—	—	—	—
Starbuck	—	1 test	—	—	—	—	—	—	—	—	—	—
WL 342	—	1 test	—	—	—	—	—	—	—	—	—	—
YieldMax	2.3	—	—	—	—	—	—	—	—	—	—	—

¹ Each seeding in any location counts as one "Test". Test data from experimental seed is retired as data from tests on commercial seed are sufficient to replace it.
² Winter Survival Index: 1=superior, 2=very good, 3=good, 4=adequate, 5=low 6=none. WSI is from joint Minnesota-Wisconsin 1996-2001 trials (Page 14 is 2001 WSI data only).
³ Locations: SE (southeast), Rosemount+Plainview; WC (west-central), Morris+Stearns County; SW (southwest), Lamberton; NE (northeast), Grand Rapids.
⁴ The full version of this table, with regional and year-1 data, is posted at the UM-Agronomy FORAGES website: www.agro.agri.umn.edu/forages

Alfalfa winter survival test results for Minnesota and Wisconsin, planted in April 2000, rated during April 2001.

Variety	Winter Survival Index: 1=Superior, 2=Very Good, 3=Good, 4=Adequate, 5=Low, 6=No Winter Survival			Mean
	Arlington, Wis.	Rosemount, Minn.	Morris, Minn.	
Beaver (index 1 check)	1.0	1.2	1.1	1.1
WL 319HQ	0.8	1.6	2.8	1.8
526 (index 2 check)	2.1	2.3	1.8	2.1
Vernal (index 2 check)	2.4	2.2	2.0	2.2
Abound	2.3	2.2	3.1	2.5
DK124	2.3	2.8	3.0	2.7
DK134	2.7	2.8	2.9	2.8
Multiplier 3	2.7	2.5	3.3	2.8
DK127	2.5	2.9	3.3	2.9
GH 700	2.7	3.0	3.1	2.9
Alliant	2.6	3.0	3.3	3.0
GoldLeaf	2.7	3.2	3.4	3.1
Somerset	2.8	3.1	3.9	3.2
Magnum V-Wet	3.4	3.2	3.2	3.3
Abundance	3.4	3.4	3.3	3.4
Ranger (index 3 check)	3.4	3.2	3.6	3.4
Dart (index 3 check)	3.7	3.6	3.2	3.5
WL 316 (index 4 check)	—	3.5	3.9	3.7
Fortress (index 4 check)	4.1	3.7	3.5	3.7
G-2852 (index 4 check)	3.8	—	—	3.8
Southern Special (index 5 check)	3.9	4.3	4.6	4.3
Archer (index 5 check)	4.1	4.2	4.7	4.3
CUF 101 (index 6 check)	6.0	6.0	6.0	6.0
MOAPA 69 (index 6 check)	6.0	6.0	6.0	6.0

Note: WSI values reported in Yield table, pages 10-13 are from this or prior Winter Survival trials, with some WSI values averaged.

Forage quality of alfalfa varieties as milk per ton and acres percent of checks.

Year-after-seeding harvest, 1996-2000.

Variety, by Milk/Acre	WI ¹ and MN ²	
	/Ton	/Acre
Nemesis	103	117
8498	101	116
FQ 314	103	115
GH 700	103	115
WinterGold	103	115
DK 141	100	114
Spirit	100	114
9429	102	113
A4230	102	113
Multi 5301	102	113
DK 140	103	112
Geneva	103	112
Radiant	103	112
53V63	103	111
Breakout	103	111
Exceed	100	111
GH 757	100	111
DK 124	105	110
Alliant	103	110
GH 767	103	110
GH 766	102	110
Cimarron VR	105	109
Award	103	109
DK 127	102	109
6410	104	108
9326	101	108
Abound	101	108
WinterStar	101	108
Sprint	102	107
Extend	101	107
205	100	107
Baralfa 321Q	103	106
Spur	103	106
DK 133	101	106
Rainier	101	106
Somerset	101	106
A30-06	101	105
Columbia 2000	100	105
WinterKing	104	104
GH 787	103	103
DK 134	102	103
53Q60	100	103
WL 322 HQ	101	101
Vernal	100	100
Cimarron	97	100
ValuePlus 1	100	98
Check, pounds per:	Ton	Acre
Vernal	2,603	8,684
LSD .05	4	11

2001 harvest of 2000 seeding.

Variety	Wisconsin ¹		Minnesota ²	
	/Ton	/Acre	/Ton	/Acre
6410	102	108	103	106
A30-06	98	106	102	105
A4230	101	116	104	107
Abound	102	107	103	101
Alliant	100	116	101	106
Cimarron	—	—	100	101
DK 124	101	110	105	108
DK 127	102	106	102	102
DK 134	98	113	101	103
GH 700	101	115	102	104
Somerset	101	121	104	112
ValuePlus 1	100	113	—	—
Vernal	100	100	—	—
Check, pounds per:	Ton	Acre		
Vernal	2,476	17,080	2,528	11,345
LSD .05	2	7	3	6

2001 harvest of 2001 seeding.

Variety	Wisconsin	
	/Ton	/Acre
6410	102	93
Legandairy YPQ	100	92
Starbuck	100	93
Vernal	100	100
Vitro	98	99
Check, pounds per:	Ton	Acre
Vernal	2,230	7,304
LSD .05	3	17

Bold values are not significantly different from highest value.

1: Milk /acre is calculated using season average quality and season average yield at Arlington, Wis.

2: Milk/acre is calculated using season average quality and season average yield at Rosemount, Minn.

Disease resistance and fall dormancy of alfalfa varieties marketed in Minnesota.

Variety ¹	Developer or Marketer ²	Seed Source ³	Fall Dormancy ⁴	Disease Resistance Ratings ^{5,6}					
				BW	VW	FW	An	PRR	Aph
Dormant									
205 -ABT	Allied Seed	37	2	HR	R	HR	R	HR	R
329 -Max	L&H Seed	32	3	HR	HR	HR	HR	HR	R
350 -ABT	Allied Seed	37	3	HR	HR	HR	HR	HR	HR
4 Traffic	Kaltenberg Seed Farms	0	4	HR	HR	HR	HR	HR	HR
400 SCL -ABT	Allied Seed	37	4	HR	HR	HR	HR	HR	HR
4200	AV Seeds	0	4	HR	HR	HR	HR	HR	HR
4375LH	Mycogen Seeds	43	4	-	-	-	R	R	R
5312	Pioneer Hi-Bred International	50	3	HR	HR	HR	HR	HR	R
53Q60	Pioneer Hi-Bred International	50	3	HR	R	R	HR	HR	R
53V08	Pioneer Hi-Bred International	50	3	HR	HR	HR	HR	HR	LR
53V63	Pioneer Hi-Bred International	50	3	HR	HR	HR	HR	HR	HR
5454	Pioneer Hi-Bred International	50	4	R	MR	HR	HR	HR	LR
54H69	Pioneer Hi-Bred International	50	4	HR	R	HR	HR	HR	R
53H81	Pioneer Hi-Bred International	50	3	HR	HR	HR	HR	R	HR
54H91	Pioneer Hi-Bred International	50	4	HR	R	HR	HR	HR	R
54V54	Pioneer Hi-Bred International	50	4	HR	HR	HR	HR	HR	MR
5-Star	Croplan Genetics	18	5	HR	R	HR	HR	HR	R
620	Garst Seed	25	2	HR	R	HR	HR	HR	R
630	Garst Seed	25	4	HR	MR	R	MR	R	-
631	Garst Seed	25	4	HR	R	HR	R	HR	MR
6310	Garst Seed	25	3	HR	R	HR	HR	HR	R
6410	Garst Seed	25	4	HR	HR	HR	HR	HR	HR
6420	Garst Seed	25	4	HR	R	HR	R	HR	R
645-II -Garst	Garst Seed	25	3	HR	HR	HR	HR	HR	HR
8599	Mallard Seed	41	4	HR	HR	HR	HR	HR	R
9326	LG Seeds	40	3	HR	R	HR	R	HR	R
9429	LG Seeds	40	4	HR	R	HR	HR	HR	HR
A 30-06	PGI/MBS	43	3	HR	HR	HR	HR	HR	HR
A-395	PGI/MBS	43	3	HR	R	HR	HR	HR	R
A4230	United Suppliers/CW	64	4	HR	HR	HR	HR	HR	HR
Abound	Monsanto	42	3	HR	HR	HR	HR	HR	HR
Abundance	BPR/Ziller Seed	63	4	HR	R	HR	R	HR	R
AC Viva	Oseco	0	3	HR	HR	-	MR	-	-
Ace	W-L Research/UAP Seeds	63	4	HR	R	HR	HR	HR	R
Affinity+Z	America's Alfalfa	9	4	HR	HR	HR	HR	HR	R
Agate	USDA/Minn. AES	2, 67	2	HR	-	HR	MR	R	-
AlfaStar	Shepard Seed/Kaystar	35	4	HR	R	HR	HR	HR	R
Alliant	Monsanto	42	4	HR	R	HR	HR	HR	HR
AmeriGraze 401+Z	America's Alfalfa	9	4	HR	R	HR	HR	HR	R
AmeriGuard 302+Z	America's Alfalfa	9	3	HR	HR	HR	HR	HR	HR
AmeriStand 201+Z	America's Alfalfa	9	2	HR	HR	HR	R	HR	HR
AmeriStand 403T	America's Alfalfa	9	4	HR	HR	HR	HR	HR	R
Arrowhead	Tri-West Seed	0	2	HR	R	HR	R	HR	R
Ascend	Kussmaul Seeds	36	5	HR	HR	HR	HR	HR	HR
AV3420	AgVenture	5	4	HR	R	HR	HR	HR	HR
Avalanche+Z	America's Alfalfa	9	2	HR	HR	HR	HR	HR	R

¹ Varieties includes those marketed in Minnesota for which disease resistance ratings were provided. Varieties which are not seeded in a recent Minnesota yield trial are excluded from Yield Tables on pages 10-13. ² Developers, from trials entrants contacts or Alfalfa Council report (www.alfalfa.org/falldormancy.html). ³ Seed source numbers reference Forage Seed Sources list, pages 20-21. KEY at end of forage crop section. ⁴ Fall dormancy & pest resistance ratings from Alfalfa Council report (www.alfalfa.org/falldormancy.html), or provided by a developer, with dormancy based on fall growth in mid-October after cutting first week of September: 9=tallest (tend to be least winterhardy), 1=shortest. ⁵ Diseases abbreviated as BW: Bacterial Wilt, PRR: Phytophthora Root Rot, FW: Fusarium Wilt, An: Anthracnose, VW: Verticillium Wilt, Aph: Aphanomyces Root Rot. ⁶ Pest Resistance Rating (percent resistant plants): HR=high resistance (51+), R=resistant (31-50), MR=moderate resistance (16-30), LR=low resistance (6-15), and S=susceptible (0-5).

Variety ¹	Developer or Marketer ²	Seed Source ³	Fall Dormancy ⁴	Disease Resistance Ratings ^{5,6}					
				BW	VW	FW	An	PRR	Aph
Dormant									
Award	Monsanto	42	4	HR	HR	HR	HR	HR	R
Badger	Bio Plant Research	13	3	HR	R	HR	HR	HR	R
Banquet	Tri-State Seed & Ag	48	4	HR	HR	HR	HR	HR	R
Baralfa 32 IQ	Barenbrug USA	12	3	HR	R	HR	HR	HR	HR
Baralfa 42 IQ	Barenbrug USA	12	4	HR	HR	HR	HR	HR	HR
BigHorn	Mycogen Seeds	43	4	HR	R	HR	HR	HR	HR
Bounty	PGI/MBS	49	2	HR	R	HR	HR	HR	R
Breakout	Brown Seed Farms	14	4	HR	R	HR	HR	HR	R
Columbia 2000	Allied Seed	8, 34	4	R	R	R	LR	LR	S
Complete	Fontanelle Hybrids	24	3	HR	HR	HR	HR	HR	R
Cyclone	Tri-State Seed & Ag	61	3	HR	HR	HR	HR	HR	HR
Defense+EV	AgriPro Seeds	0	3	HR	HR	HR	HR	HR	HR
Defiant	AgriPro Seeds	3	2	HR	HR	HR	R	HR	R
Depend+EV	AgriPro Seeds	3	4	HR	HR	HR	HR	HR	R
DK124	Monsanto	42	2	HR	HR	HR	HR	HR	HR
DK127	Monsanto	42	3	HR	R	R	HR	HR	HR
DK134	Monsanto	42	3	HR	HR	HR	HR	HR	HR
DK140	Monsanto	42	4	HR	R	HR	HR	HR	HR
DK141	Monsanto	42	4	HR	HR	HR	HR	HR	HR
DK142	Monsanto	42	4	HR	R	HR	R	HR	HR
DKA37-20	Monsanto	42	3	HR	HR	HR	HR	HR	HR
DKA42-15	Monsanto	42	4	HR	HR	HR	HR	HR	HR
Dominator	AgriPro Seeds	3	4	HR	R	HR	HR	HR	R
Emperor	ABI Alfalfa	1	4	HR	HR	HR	HR	HR	HR
Empire	Brunner Seed Farm	15	2	HR	R	HR	HR	HR	R
Enhancer	Fontanelle Hybrids	24	4	HR	R	HR	R	HR	MR
EverGreen	Syngenta	57	3	HR	R	HR	HR	HR	R
Evolution	Mycogen Seeds	43	2	HR	R	HR	HR	HR	R
Extend	Spangler Seedtech	55	4	HR	R	R	HR	HR	R
Feast+EV	AgriPro Seeds	3	3	HR	HR	HR	R	HR	HR
Forecast 1001	Dairyland Seed	20	4	HR	R	HR	R	HR	R
Forecast 3000	Dairyland Seed	0	4	HR	R	HR	R	R	MR
Forecast 3001	Dairyland Seed	20	3	HR	R	HR	R	HR	R
FQ 302HR	Mycogen Seeds	43	3	HR	R	HR	HR	HR	HR
FQ 314	Mycogen Seeds	43	3	HR	HR	HR	HR	HR	HR
FQ 315	Mycogen Seeds	43	3	HR	R	HR	HR	HR	HR
Garst 645	Garst Seed	0	3	HR	R	R	HR	HR	MR
Gateway	Jung Seed Genetics	33	4	HR	R	HR	HR	HR	R
Geneva	Syngenta	57	4	HR	HR	HR	HR	HR	HR
GoldLeaf	Albert Lea/Gold Country	6, 27	3	HR	R	HR	R	HR	R
GH700	Golden Harvest	28	4	HR	HR	HR	HR	HR	HR
GH750	Golden Harvest	29	4	HR	HR	HR	HR	HR	HR
GH757	Golden Harvest	28	4	HR	HR	HR	HR	HR	HR
GH766	Golden Harvest	29	3	HR	R	HR	HR	HR	R
GH767	Golden Harvest	28	2	HR	R	HR	HR	HR	R
GH787	Golden Harvest	0	3	HR	R	R	HR	HR	R
Gold Plus	PGI/Top Farm Hybrids	49, 59	4	HR	R	HR	HR	HR	R
Good as Gold II	Dairyland Research	0	4	HR	R	HR	R	HR	MR
GreenFeast	North-Gro/W-L Res.	47	2	HR	HR	HR	HR	HR	HR
Guardian	AgVenture	5	3	HR	HR	HR	HR	HR	R
Harvstar 812HY	Fielder's Choice Direct	23	4	HR	R	HR	R	HR	R
Hay Maker II	Kussmaul Seeds	36	4	HR	R	HR	HR	HR	R
Hunter	Ramy International	53	4	HR	R	HR	HR	HR	R
HybriForceTM-400	Dairyland Seed	20	4	HR	R	HR	R	HR	MR

Disease resistance and fall dormancy of alfalfa varieties marketed in Minnesota (continued).

Variety ¹	Developer or Marketer ²	Seed Source ³	Fall Dormancy ⁴	Disease Resistance Ratings ^{5,6}					
				BW	VW	FW	An	PRR	Aph
Dormant									
HybriGreen-41	Dairyland Research	0	4	HR	R	HR	R	HR	MR
Ignite	Jung Seed Genetics	33	3	HR	R	HR	HR	HR	HR
Imperial	ABI Alfalfa	1	3	HR	R	HR	HR	HR	R
Innovator+Z	America's Alfalfa	9	3	HR	HR	HR	HR	HR	R
Iroquois	Cornell Univ.	2, 6, 52	2	HR	S	MR	S	S	-
Jade II	NC+ Hybrids	44	4	HR	R	HR	R	HR	MR
Journey 204 Hybrid	Fontanelle Hybrids	24	4	HR	R	HR	HR	HR	R
Lactator	Elk Mound Seed	0	2	HR	HR	HR	HR	R	R
Laser	Ampac Seed	10, 65	4	HR	R	HR	R	HR	MR
Legend Gold	Legend Seeds	38	3	HR	HR	HR	HR	HR	HR
LegenDairy 2.0	Croplan Genetics	18	3	HR	R	HR	HR	HR	R
LegenDairy YPQ	Croplan Genetics	18	3	HR	R	HR	HR	HR	HR
LH 3000	Jung Seed Genetics	33	3	HR	HR	HR	HR	HR	R
Lightning II	Jung Seed Genetics	33	4	HR	HR	HR	HR	R	MR
MagnaGraze	Dairyland Seed	20	3	HR	R	HR	R	HR	R
Magnum III	Dairyland Seed	20	4	R	MR	R	MR	R	LR
Magnum III-Wet	Dairyland Seed	20	3	R	MR	R	MR	R	MR
Magnum IV	Dairyland Seed	20	4	HR	R	HR	R	HR	MR
Magnum V	Dairyland Seed	20	4	HR	R	HR	R	HR	MR
Magnum V-Wet	Dairyland Seed	20	3	HR	R	HR	R	HR	R
Mainstay	AgVenture	5	3	HR	R	HR	HR	HR	R
Mariner	Allied Seed	8	2	R	MR	HR	MR	HR	MR
Mariner II	Allied Seed	8	2	HR	R	HR	R	HR	R
Maxi-Graze GT	Croplan Genetics	18	2	HR	R	HR	HR	HR	R
Maximum I	Gutwein/Garst Seeds	31	3	HR	HR	HR	HR	HR	R
Milk River	R.J. Hunt Seed	52	3	HR	R	HR	HR	HR	R
Monument	Geertson Seed Farms	26	3	R	LR	R	-	MR	-
Monument II	Geertson Seed Farms	26	4	R	LR	HR	S	R	-
MP2000	Croplan Genetics	18	3	HR	R	HR	HR	HR	HR
Multi 5301	Geertson Seed Farms	26	4	R	R	HR	HR	MR	-
Multi 5302	Geertson Seed Farms	0	4	HR	R	HR	MR	MR	MR
Multiplier III -TMF	Mycogen Seeds	43	3	HR	R	HR	HR	HR	HR
Multiplier II -TMF	Mycogen Seeds	43	3	HR	HR	HR	HR	HR	R
MultiQueen	Gutwein/Garst Seeds	31	4	HR	R	HR	HR	HR	R
Nemesis	Renk Seed	54	3	R	HR	HR	HR	HR	HR
NetYield 500	NetSeeds	45	4	HR	R	HR	R	HR	MR
Notice	Midwest Seed Genetics	17	3	HR	R	HR	HR	HR	R
NutriMax	Alfalfa Genetics Direct	7	4	HR	HR	HR	HR	HR	R
Oneida VR	N.Y.S.I.P./Public	0	3	R	HR	HR	MR	MR	-
Paragon BR	Big Plant Research	13	3	HR	R	HR	R	HR	R
Perfect	Grassland Central	30	4	HR	HR	HR	HR	HR	HR
Persist	Kaltenberg Seed Farms	34	4	HR	R	HR	R	HR	MR
Phabulous	Trelay Seed	60	4	HR	HR	HR	HR	HR	HR
Phirst	Doebler's PA Hybrids	21	4	HR	R	HR	HR	HR	R
Platinum	Midwest Seed Genetics	0	4	HR	HR	HR	HR	HR	HR
Pointer	Dahlco Seeds	19	4	HR	R	HR	HR	HR	HR
Pristine	Doebler's PA Hybrids	0	4	HR	R	HR	HR	HR	R
Profific	Doebler's PA Hybrids	13	3	HR	R	HR	R	HR	R
Quantum	Renk Seed	54	2	HR	HR	HR	HR	HR	R
Radiant	Ampac/DeLong	10, 58, 65	4	HR	HR	HR	HR	HR	HR
Rainier	Syngenta	57	3	HR	R	HR	HR	HR	HR
Ranger	USDA/Nebraska AES	2	3	MR	S	MR	S	S	-
Rebel	Target Seeds	0	4	HR	HR	HR	HR	HR	HR

Variety ¹	Developer or Marketer ²	Seed Source ³	Fall Dormancy ⁴	Disease Resistance Ratings ^{5,6}					
				BW	VW	FW	An	PRR	Aph
Dormant									
Rebound 4.2	Croplan Genetics	18	4	HR	HR	HR	HR	HR	HR
Reliance	Allied Seed	8	3	HR	HR	HR	HR	HR	R
Rhino	Geertson Seed Farms	26	3	HR	R	R	R	R	R
Ripin	Ampac/DeLong	10, 58	4	HR	R	HR	R	HR	R
Rocket	Croplan Genetics	18	4	HR	R	HR	HR	HR	HR
Root 66	Trelay Seed	60	4	HR	HR	HR	R	HR	HR
Rustler II	Andrews Seed	11	4	HR	HR	HR	HR	HR	R
Samurai	ABI Alfalfa	0	3	HR	R	HR	HR	HR	R
Somerset	Syngenta	57	3	HR	HR	HR	HR	HR	HR
Spirit	PGI Alfalfa	49	3	HR	R	HR	R	HR	MR
Spredor 3	Syngenta	57	1	HR	MR	HR	R	MR	S
Sprint	Specialty Seeds	56	3	HR	R	HR	R	HR	HR
Spur	Allied Seed	8	4	HR	R	HR	HR	HR	R
Stampede	Allied Seed	8	3	HR	R	R	-	HR	R
Starbuck	Spangler Seedtech	55	3	HR	R	HR	HR	HR	HR
Standout	Ray Brothers Seed Farms	0	3	R	MR	R	R	R	MR
Sterling	Mycogen Seeds	43	2	HR	R	HR	HR	HR	R
Surpass	Andrews Seed	6, 11, 52	3	HR	R	HR	MR	R	-
Target II Plus	Producers Hybrids	51	3	HR	R	HR	R	HR	MR
Teton	S. Dakota Agr. Exp. Sta.	2	1	LR	-	MR	S	LR	-
TMF 421	Mycogen Seeds	43	2	HR	HR	R	HR	HR	HR
TMF 4355LH	Mycogen Seeds	43	3	HR	R	HR	HR	HR	R
Travois	S. Dakota Agr. Exp. Sta.	2, 6	1	R	-	MR	S	S	-
Trophy	Geertson Seed Farms	26	4	R	R	HR	R	HR	R
UltraLac	Elk Mound Seed	22	2	HR	HR	HR	HR	HR	HR
Value Plus 1	Brown Seed Farms	14	4	HR	R	HR	HR	HR	R
Vernal	USDA/Wis. AES	2, 6, 48, 52, 67	2	R	-	MR	-	-	-
Viking 1	Syngenta	57	2	R	HR	HR	R	R	-
Vitro	North-Gro Seed	47	3	HR	HR	HR	HR	HR	R
Voyager II	Lemke Seeds/Ziller Seed	39, 69	4	HR	R	HR	R	HR	MR
WetLand	Producers/Spangler	69	3	R	MR	R	R	HR	MR
WinterCrown	Ampac/DeLong	10, 58	3	HR	R	HR	R	HR	R
WinterGold	L&H Seed/Reuk Seed	54	4	HR	HR	HR	HR	HR	HR
WinterGreen	Reuk Seed	54	3	HR	HR	HR	HR	HR	R
WinterKing	Wensman Seed	66	3	HR	HR	HR	HR	HR	R
WinterMax	Alfalfa Genetics Direct	7	2	HR	HR	HR	HR	HR	R
WinterStar	Wensman Seed	66	2	HR	HR	HR	HR	HR	R
WL 232 HQ	W-L Research	4, 48, 63, 68	2	HR	HR	HR	HR	HR	HR
WL 319HQ	W-L Research	63	3	HR	HR	HR	HR	HR	HR
WL 324	W-L Research	4, 48, 63, 68	3	HR	R	HR	HR	HR	HR
WL 325 HQ	W-L Research	4, 48, 63, 68	3	HR	R	HR	HR	HR	R
WL 326 GZ	W-L Research	48, 63	4	HR	HR	HR	HR	HR	HR
WL 327	W-L Research	4, 48, 63, 68	4	HR	R	HR	HR	HR	HR
WL 342	W-L Research	4, 48, 63, 68	4	HR	HR	HR	HR	HR	HR
Wrangler	USDA / Nebraska AES	2, 6, 48, 52, 67	2	R	LR	R	LR	HR	-
Yielder	AgriPro Seeds	3	3	HR	HR	HR	R	HR	-
YieldMax	Alfalfa Genetics Direct	7	4	HR	HR	HR	HR	HR	HR

¹ Varieties includes those marketed in Minnesota for which disease resistance ratings were provided. Varieties which are not seeded in a recent Minnesota yield trial are excluded from Yield Tables on pages 10-13. ² Developers, from trials entrants contacts or Alfalfa Council report (www.alfalfa.org/falldormancy.html). ³ Seed source numbers reference Forage Seed Sources list, pages 20-21. KEY at end of forage crop section. ⁴ Fall dormancy & pest resistance ratings from Alfalfa Council report (www.alfalfa.org/falldormancy.html), or provided by a developer, with dormancy based on fall growth in mid-October after cutting first week of September: 9=tallest (tend to be least winterhardy), 1=shortest. ⁵ Diseases abbreviated as BW: Bacterial Wilt, PRR: Phytophthora Root Rot, FW: Fusarium Wilt, An: Anthracnose, VW: Verticillium Wilt, Aph: Aphanomyces Root Rot. ⁶ Pest Resistance Rating (percent resistant plants): HR=high resistance (51+), R=resistant (31-50), MR=moderate resistance (16-30), LR=low resistance (6-15), and S=susceptible (0-5).

Forage Seed Sources, key number refers to Seed Source column in preceding table.

0	No marketer, or discontinued for 2002. The variety is listed to update previous report with 2001 production year data.	11	Andrews Seed Co. 580 S. Oregon, Ontario, OR 97914 541-889-9109	25	Garst Seed Co. 2369 330th St, Slater, IA 50244 800-831-6630
1	ABI Alfalfa, Inc. 2316 259th St., Ames, IA 50014 515-292-2432	12	Barenbrug Midwest 1506 West 32nd St., Vinton, IA 52349 888-470-5569, 319-472-5569	25	Garst Seed Co. RR1 Box 111, Dawson, MN 56232 320-769-4445
1	ABI Alfalfa, Inc. 12351 West 96th Terrace, Suite 101, Lenexa, KS 66215 800-873-2532	12	Barenbrug USA P.O. Box 239, Tangent, OR 97389 800-547-4101	26	Geertson Seed Farm 1665 Burroughs Rd, Adrian, OR 97901 800-843-0390
*2	Agassiz Seed & Supply 445 7th St. NW, West Fargo, ND 58078 701-282-8118	13	Bio Plant Research P.O. Box 320, 116E. State St., Camp Point, IL 62320 800-593-7708, 217-593-7707	27	Gold Country Seed 16506 Hwy 15N, P.O. Box 6043 Hutchinson, MN 55350 320-587-1050
3	AgriPro Seeds, Inc. 2369 330th St., Slater, IA 50244 800-831-6630	*14	Brown Seed Farms 720 St. Croix, Box 186, Prescott, WI 54021 800-712-7696, 715-262-4331	28	Golden Harvest Seeds 27525 135th Ave. North, Cordova, IL 61242 309-654-2234
4	AgVenture East 65064 250th Ave., Kasson, MN 55944 800-657-4890	15	Brunner Seed W3850 U.S. Hwy 10, Durand, WI 54736 715-672-5887	28	Golden Harvest Seeds 251 West Main St., Wabasha, MN 55981 612-565-2945
5	AgVenture Central 513 Main St., Madison Lake, MN 56063 507-243-3263	*16	CEBECO International Seeds Inc. P.O. Box 229, Halsey, OR 97348 541-369-2251	29	Golden Harvest/J.C. Robinson Box A, 100 J.C. Robinson Blvd. Waterloo, NE 68069 402-779-2531
5	AgVenture Inc. P.O. Box 29, 207 N 7th St. Kentland, IN 47951-0029 888-999-0859, 219-474-5557	17	Channel Bio Corp P.O. Box 157, Kentland, IN 47951 219-474-6868	29	Golden Harvest/J.C. Robinson 102 Ringer Drive, Sherburne, MN 56171 507-764-3640
5	AgVenture West P.O. Box 184, Jeffers, MN 56145 507-628-4929	*18	CroPlan Genetics P.O. Box 64406, MS7455 St. Paul, MN 55164-0406 800-851-8810, 651-634-8105	30	Grassland Central 12912 Ventura Court #24 Shakopee, MN 55379 952-233-5181
*6	Albert Lea Seed House 1414 West Main, P.O. Box 127 Albert Lea, MN 56007 800-352-5247, 507-373-3161	19	Dahleo Seeds 14730 15th St., Cokato, MN 55321 320-286-5982	31	Gutwein/Garst Seeds 15691 West 600 South, Francesville, IN 47946 866-486-9346
7	Alfalfa Genetics Direct P.O. Box 404, Princeton, IL 61356-0404 866-233-7283	*20	Dairyland Seed Co. P.O. Box 958, West Bend, WI 53095 800-236-0163	31	Gutwein/Garst Seeds 6659 E Hunter Ridge Ct., Monticello, IN 47960 219-583-9083
8	Allied Seed 1108 Hillsdale Drive, Macon, MO 63552 800-880-8127	21	Doebbler's PA Hybrids RR1 Box 424, Jersey Shore, PA 17740 800-853-2676	32	Johnson Seeds P.O. Box 3000, Arborg, MB, R0C 0A0 204-376-5528
8	Allied Seed 9311 Highway 45, Nampa, ID 83686 219-833-6992	22	Elk Mound Seed P.O. Box 187, 308 Railroad Ave. Elk Mound, WI 54738 715-879-5556	*33	Jung Seed Genetics, Inc. 341 South High St., Randolph, WI 53956 800-242-1865, 920-326-5891
9	America's Alfalfa 1870 Backbone Road West, Box 20 Princeton, IL 61356-0404 800-873-2532	23	Fielder's Choice Bineot 306 North Main St., Box 898 Monticello, IN 47960 800-321-3177, 219-583-2741	*33	Jung Seed Genetics 723 Madison Ave. South, Eyota, MN 55934 507-545-0151
*10	AMPAC Seed Co. 5167 Deerskin Drive, Westerville, OH 43081 888-358-2930, 614-890-2929	24	Fontanelli Hybrids 10981 8th St., Fontanelle, NE 68044-2505 402-721-1410	34	Kaltenberg Seed Farms P.O. Box 276, 55506 Hwy. 19 Wauwatsee, WI 53097 800-383-3276, 608-849-5021
*10	AMPAC Seed Co. 403 Wooster Rd., Winona Lake, IN 46590 219-268-9549			35	KayStar Seeds P.O. Box 647, Huron, SD 57350 605-352-6794

- 35 Shepherd Seeds
RR 1 535 Middle Rd., South Beloit, IL 61080
800-383-2676
- 36 Kussmaul Seeds
9020 Hwy. 18, Mt. Hope, WI 53816
608-988-4568
- *37 La Crosse Forage & Turf Seed Co.
P.O. Box 995, LaCrosse, WI 54602-0995
800-329-1909
- 38 Legend Seeds
P.O. Box 241, DeSmet, SD 57006
605-854-3346
- 39 Lemke Seeds
10220 N. Granville Rd., Mequon, WI 53097
262-242-2647
- 40 LG Seeds
N8181 940th St., River Falls, WI 54022
800-637-2887, 715-426-7577
- 40 LG Seeds
15434 NE 70th St., Elk River, MN 55330
612-618-4712
- 41 Mallard Seed
P.O. Box 637, 311 W. Broadway
Plainview, MN 55964
800-562-1768, 507-534-2300
- 42 Monsanto
3670 CR 207, Liberty Hill, TX, 78642
512-778-5316
- 43 Mycogen Seeds/Dow Agroscience
9330 Zionville Road, Building 308/3E
Indianapolis, IN 46268
317-337-7560
- 44 NC+ Hybrids
Box 4408, Lincoln, NE 68504
800-279-7999, 402-467-2517
- 44 NC+ Hybrids
417 West 9th St., Spencer, IA 51301
712-262-9216
- 45 NetSeeds
9001 Hickman Rd., Ste.320
Urbandale, IA 50322
515-331-0939
- 46 North Star Genetics/Falk Seed Farm
1178 Hwy. 9 NE, Murdock, MN 56271
320-875-4341
- 47 North-Cro Seeds Inc.
613 W. Randolph St., Ouba City, WI 53807
608-744-7333
- *48 Olds Seed Solutions
2901 Packers Ave., Madison, WI 53704
800-356-7333, 608-249-9291
- *48 MN/Olds Seed Solutions
P.O. Box 346, Savage, MN 55378
800-328-5898, 952-445-2606
- 49 PGI Alfalfa Inc.
225 West 1st St., Story City, IA 50248
800-247-3967, 515-733-5274
- 50 Pioneer Hi-Bred International Inc.
7100 NW 62nd Ave., Box 1150
Johnston, IA 50131
515-334-6935
- 51 Producers Hybrids, Inc.
P.O. Box C, Battle Creek, NE 68715
888-675-3190, 402-675-2975
- *52 R.J. Hunt Seed Co.
13477 Co. Rd. 101, Wadena, MN 56482
218-631-4190
- 53 Ramy International Ltd.
1329 N. River Front Drive
Mankato, MN 56001
800-658-7269, 507-387-4091
- *54 Renk Seed Company
6800 Wilburn Rd., Sun Prairie, WI 53590
800-289-7365, 608-837-7351
- 55 Spangler Seedtech Inc.
803 W. Racine St., Jefferson, WI 53549
800-284-1080, 414-674-4606
- 56 Specialty Seeds
26787 Hillhaven Dr., Cold Spring, MN 56320
320-685-4520
- 57 Syngenta Seeds, Inc.
P.O. Box 959, 7500 Memorial Highway
Golden Valley, MN 55427
763-593-7286
- 58 The DeLong Company
513 Front St., Clinton, WI 53525
608-676-2255
- *59 Top Farm Hybrids
P.O. Box 850, Cokato, MN 55321
320-286-5516
- 60 Treloy Seed Co.
11623 State Rd 80, Livingston, WI 53554
800-421-0397, 608-943-6363
- 61 Tri-State Seed & Ag
28401 Golden Gate Rd.
Sleepy Eye, MN 56085
800-203-8581, 507-794-3078
- *62 Twin Cities Seeds
7265 Washington Ave. South, Edina, MN 55439
800-545-8873, 612-545-8879
- 63 UAP Midwest
P.O. Box 10, Wall Lake, IA 51466
712-664-2444
- 64 United Suppliers Inc.
P.O. Box 538, Eldora, IA 50627
515-858-2341
- *65 Welter Seed & Honey
17724 Hwy. 136, Onslow, IA 52321
319-485-2762
- 66 Wensman Seed Co.
P.O. Box 190, Wadena, MN 56482
218-631-2954
- *67 Werner Farm Seeds
3104 Millersburg Blvd., Dundas, MN 55019
507-645-7995
- 68 W-L Research, Inc.
P.O. Box 8112, 2901 Packers Ave.
Madison, WI 53708-8112
800-406-7662, 608-240-0630
- 69 Ziber Seed Co., inc.
78374 380th St., Bird Island, MN 55310
320-365-3674

* These sources are useful contacts for public alfalfas (2,6,10,52,67) and several other forages species, such as:

- Red clover (2,6,10,14,16,18,20,30,33,37,48,52,54)
Birdsfoot trefoil (2,6,8,10,16,37,48,52,62,67)
Kura clover (6,10,37,48,58,67)
Alsike, ladino, white clovers (6,8,10,14,16,62)
Reed canarygrass (2,6,8,10,14,37,48,52,58,67)
Smooth bromegrass (2,6,8,18,48,54)
Orchardgrass (2,6,10,16,18,37,48,52,54,58,62,67)
Timothy (2,6,10,14,16,18,37,48,52,54,58,62,67)
Tall fescue (2,6,8,10,16,18,37,48,52,58,62)
Ryegrass (6,8,10,48,53,62,65).

BIRDSFOOT TREFOIL

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 1994, 1998 and 1999 and in Grand Rapids in 1994 and 1998. The trials were harvested twice at Grand Rapids and three times at Rosemount also, except in 1999 and 2001 when Rosemount was only harvested twice as well.

Roseau and Nueltin, two varieties that have increased natural tolerance to the herbicide Roundup, will be on the market soon. Steadfast, a rhizomatous birdsfoot trefoil released in Missouri, was significantly lower yielding than other varieties in the trial and may not be winterhardy enough to be grown in Minnesota.

Winterhardy varieties, such as Norcen, produced the highest overall yields.

Norcen, released in 1983 by the agricultural experiment stations of Minnesota and six other states, has performed exceptionally well in grazing trials.

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

BROMEGRASS

Bromegrass is generally grown for hay in mixture with alfalfa, or is used as pasture in mixture with other grasses and legumes. Varieties can be classed as southern, intermediate and northern types. Varieties of the southern type may

not be higher yielding but are generally less susceptible to leaf diseases and earlier in maturity than northern types. All varieties are winterhardy. Some stand losses may occur when bromegrass is managed under three- and four-cut alfalfa harvest systems.

Varieties are currently being evaluated in pure stands at Minnesota experiment stations with a three-cut harvest system. Nitrogen was applied at all locations in early spring and after the first two harvests at a rate of 40 to 50 pounds per acre. Average dry matter yields were very high in 1998-99 and few differences were found between performance of the varieties. Stand losses on all entries included in the table were noted in Rosemount after the first harvest in 1999, except for the variety York.

Dry matter yield, in tons dry matter per acre, of smooth bromegrass seeded at two locations.

Variety	Rosemount	Morris
	1998-2000	1999-2001
Alpha	4.8	4.6
Badger	4.4	4.5
Bounty	4.8	4.7
Lincoln ¹	4.5	—
York	5.2	4.7
LSD 5%	0.3	NS

¹ The Lincoln seedlot had low germination, which resulted in poor stand establishment.

Dry matter yield, in tons dry matter per acre, of birdsfoot trefoil varieties seeded at Grand Rapids and Rosemount.

Variety	Rosemount			Grand Rapids	
	1995-1996	1998	1999-2001	1995-1996	1999-2001
Bright	—	3.6	3.1	—	—
Dawn	—	4.0	3.8	—	4.8
Empire	3.6	4.0	—	2.2	4.4
Fergus	—	3.9	—	—	—
Georgia 1	—	—	3.6	—	4.6
Leo	3.5	3.9	3.1	2.3	—
Norcen	3.6	4.3	3.5	2.2	4.8
Nueltin	3.3	3.7	3.1	—	4.2
Roseau	3.4	4.1	3.4	—	4.6
Steadfast	—	3.1	2.7	—	3.5
Trevig	—	4.1	—	—	—
Viking	3.8	3.8	3.6	2.2	4.4
Witt	3.5	4.0	3.2	—	—
LSD 5%	NS	0.5	0.3	0.2	0.5

Bromegrass Planting Rate and Date

Bushel Weight, Pounds	14
Seeds/Pound.....	136,000
Planting Rate, Pounds/Acre	
Alone	16
In Mixtures.....	5
Planting Rate, Seeds Sq.Ft.	
Alone	50
In Mixtures.....	15
Planting Date.....	Early Spring or Late Summer

CICER MILKVETCH

Cicer milkvetch is a vigorous, persistent, high-yielding perennial legume that spreads by rhizomes. Stands can persist for many years under heavy grazing and can tolerate stress well once established. It tolerates drought well and is grown extensively for grazing in the western United States. It is also very winterhardy and resistant to insects and disease, but has poor seedling vigor and may take two years to adequately establish. It also has some unknown anti-quality components that can cause photosensitization and hair loss on some grazing ruminants. More evaluation is needed before widespread use of cicer milkvetch is recommended for grazing in Minnesota.

Hi Pal, a variety developed at Minnesota AES, was selected for plant vigor and palatability under grazing. It will be on the market when adequate seedstocks are obtained.

Varietal evaluations were seeded in pure stands at three locations in 1998, 1999, 2000 and 2001 to evaluate forage yields. All locations were harvested twice each year except Rosemount was harvested three times in 2000.

Dry matter yield, in tons dry matter per acre, of cicer milkvetch varieties seeded at three locations.

Variety	Grand Rapids	Rosemount	Morris
	1999-2001	1999-2001	1999-2001
Hi Pal	3.8	4.5	4.9
Lufana	3.5	4.3	4.8
Monarch	3.4	4.3	4.7
Windsor	3.2	4.2	4.4
LSD 5%	0.5	0.2	0.5

Cicer Milkvetch Planting Rate and Date

Bushel Weight, Pounds	60
Seeds/Pound.....	122,000
Planting Rate, Pounds/Acre	
Alone	16
Planting Rate, Seeds Sq.Ft.	
Alone	50
Planting Date.....	Early Spring or Summer

ORCHARDGRASS

Orchardgrass is often 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 winterhardiness, but it can persist and remain productive in areas with reliable snow cover.

Orchardgrass varieties were established in pure stands in 1998 and 1999 at Rosemount and Grand Rapids and in 1997 at Rosemount and Morris.

Experimental plots were generally harvested three times per year. The Morris location was harvested only twice in 1999. Nitrogen was applied in the early

spring and after each harvest at rate of 50 pounds per acre.

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, in tons dry matter per acre, of orchardgrass varieties seeded at three locations.

Variety	Grand Rapids		Rosemount		Morris
	1990-1994	1999-2001	1998-2000	1999-2001	1999-2001
AC Nordic	-	3.7	-	3.7	-
Albert	-	3.9	-	-	-
Ambassador	3.5	3.6	4.4	-	2.6
Bengal	-	-	-	3.7	-
Condor	-	3.8	4.5	-	2.6
Crown	3.5	-	4.5	-	2.6
Dawn	3.6	-	-	-	-
Duke	-	3.8	4.8	3.7	3.1
Elsie	3.5	3.5	-	3.5	-
Haymate	-	3.7	4.5	-	2.7
Hawkeye	-	3.9	-	4.0	-
Justus	3.4	3.4	4.5	3.7	2.7
Megabite	-	3.7	-	4.0	-
Mammoth	-	-	-	3.9	-
Napier	3.6	-	4.3	-	2.1
Orbit	3.4	-	3.6	-	2.8
Orion	3.7	4.1	4.7	4.0	3.2
Potomac	3.5	-	4.4	3.6	2.6
Shawnee ¹	-	3.0	-	-	-
Sterling	3.4	-	-	-	-
Warrior	-	-	-	3.8	-
LSD 5%	NS	0.4	0.4	0.3	0.8

¹ Shawnee seedlot received for testing had poor germination and did not establish at Rosemount and Morris.

RED CLOVER

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

Historically, the winterhardy varieties of red clover have not persisted beyond two crop years in Minnesota because they are susceptible to diseases and winter kill.

Dry matter yield of red clover, in tons dry matter per acre, seeded at three locations in 1995.

Variety	Grand Rapids		Rosemount		Morris		
	1999-2001	2000-2001	1997-1998	2000	1996	1997	1998
Arlington	2.9	3.0	4.1	5.2	3.2	2.0	2.9
Astred	-	-	2.8	-	2.5	1.8	2.7
Cinnamon	-	-	4.5	-	3.4	2.1	3.0
Freedom	-	3.2	-	5.5	-	-	-
Juliette	-	3.3	-	5.6	-	-	-
Marathon	3.4	3.2	4.0	5.6	3.4	1.7	2.6
Prima	3.4	3.5	-	5.3	-	-	-
Randolph	3.5	-	4.1	-	3.8	2.0	2.8
Redland III	-	-	-	-	3.3	1.9	2.8
Redstar	-	3.4	-	5.9	-	-	-
Scarlett	3.4	-	4.2	-	3.7	1.8	2.8
LSD 5%	0.2	0.3	0.6	0.6	NS	0.3	NS

However, most of the improved varieties currently sold for use in Minnesota can persist for three years if the weather provides good winter snow cover.

Minnesota Agricultural Experiment Station scientists established performance trials of red clover at two locations in 1995. The trials, established in 1995, were harvested at Morris in 1996 and 1997 and at Rosemount in 1997 and 1998. A trial established at Grand Rapids

in 1998 was harvested in 1999 and 2000. Two more locations were established in 1999 and harvested two or three times in 2000-2001. The 1998 trial at Rosemount was accidentally destroyed.

Varietal differences for forage yield were generally not great. The one exception is Astred, which does not seem to persist in Minnesota. Some of the newer varieties tended to produce higher forage yields during the third production year.

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	50
In Mixtures	30
Planting Date	
Alone	Early Spring to September 1
In Mixture	Use Date for Legume

REED CANARYGRASS

Reed canarygrass is adapted throughout Minnesota for use as hay, pasture and silage. It is one of the best grass species for poorly drained soils and tolerates flooding better than other cool-season grasses. The species utilizes nitrogen efficiently and is adapted to liquid manure application. However, seedling vigor of reed canarygrass is not as good as that of other commonly used forage grasses.

Prior to 1985, common reed canarygrass was described as being less palatable than most other grass species seeded for hay and pasture.

The most recent developments in reed canarygrass breeding have been the release of varieties low in indole alkaloid concentration. This factor dramatically improves animal performance and palatability. Alkaloids are bitter, complex, nitrogen-containing compounds.

In grazing trials, lambs and steers gained more weight and sheep had less diarrhea on low alkaloid varieties than on common reed canarygrass. Hay should be harvested between the boot and early heading stage because quality declines with maturity. Each of the available reed canarygrass varieties is winterhardy and persistent in Minnesota.

Dry matter yields, in tons dry matter per acre, of reed canarygrass at three locations in Minnesota.

Variety	Grand Rapids		Rosemount		Morris
	1994-1996	2000	1994-1996	2000-2001	1994-1996
Chiefton	-	6.3	-	4.0	-
Lara	-	-	3.0	-	-
Palaton	3.5	6.7	3.1	4.2	6.1
Rise	-	-	-	-	-
Rivel	-	6.2	-	4.3	-
Vantage	3.3	6.7	3.3	4.1	5.7
Venture	3.5	6.7	3.1	4.3	5.5
LSD 5%	NS	NS	NS	NS	NS

Trials were established in pure stands in 1993 at Morris, Grand Rapids and Rosemount. Trials were also established in 1999 at Rosemount and Grand Rapids. Trials are generally harvested three times per year. Nitrogen was applied early in the spring and after the first two harvests at a rate of 40 to 50 pounds per acre.

**Reed Canarygrass
Planting Rate and Date**

Bushel Weight, Pounds	46
Seeds/Pound.....	526,000
Planting Rate, Pounds/Acre	
Alone	7
In Mixtures.....	5
Planting Rate, Seeds Sq.Ft.	
Alone	85
In Mixtures.....	60
Planting Date	
Alone	Early Spring or Late Summer
With Legumes	Use Date for Legume

in 1992, 1997 and 1998. The trials were harvested three times per year, and nitrogen was applied in the early spring and after each harvest at rates of 50 pounds per acre.

Yields have been generally good, except at Rosemount in 1995 when plots suffered severe winter injury. The wheatgrasses and fescue x ryegrass hybrids yielded less forage than the tall fescue varieties. The wheatgrasses are better adapted to environments drier than the previous growing seasons. The fescue x ryegrass hybrids seem particularly prone to winter injury.

**Tall Fescue
Planting Rate and Date**

Bushel Weight, Pounds	25
Seeds/Pound.....	229,000
Planting Rate, Pounds/Acre	
Alone	10
In Mixtures.....	4
Planting Rate, Seeds Sq.Ft.	
Alone	50
In Mixtures.....	20
Planting Date	
Alone	Early Spring or Summer
With Legumes	Use Date for Legume

TALL FESCUE

Tall fescue, a bunchgrass, may be planted in mixtures with other grasses and legumes. It establishes rapidly, withstands trampling, tolerates summer drought and produces fall-season pasture when other grasses become dormant. Tall fescue is subject to winter injury, but it may remain productive in areas with reliable snow cover.

Animal performance is better when the variety grown is endophyte-free. Endophytes are fungi that invade plant tissues, reducing forage palatability and animal performance.

The wheatgrasses are valuable native forage species. They are especially suitable for growing in the northern Great Plains area of the United States. The variety Newhy is a wheatgrass x quackgrass hybrid. Wheatgrasses can produce excellent forage yields and sustained productivity under hay and pasture management systems, either in monoculture or in mixtures with alfalfa or other suitable legumes. Recent releases of improved varieties have prompted interest in these species, especially in western areas of Minnesota.

Minnesota Agricultural Experiment Station scientists initiated performance trials of tall fescue and the wheatgrasses

Dry matter yields, in tons dry matter per acre, of tall fescue, wheatgrass and festuca-lolium hybrids seeded at three locations.

Variety	Grand Rapids		Rosemount		Morris
	1994-1996	1999-2001	1993-1995	1998-2000	1993-1996
Tall Fescue					
Barcel	3.0	-	5.3	-	4.5
Cajun	-	4.9	-	5.3	-
Fawn	3.3	-	4.9	-	5.0
Ky 31	3.5	4.6	5.8	-	4.7
Ky 31 endophyte-free	3.3	-	5.6	5.9	4.9
Martin	3.6	4.9	5.3	4.8	4.7
Maximize	-	4.6	-	5.1	-
Mozark	3.5	4.8	5.4	5.5	4.8
Mustang	2.7	4.3	4.7	4.9	-
Seine	-	-	-	5.6	4.8
Stef	3.3	-	5.3	-	-
Festuca-Lolium Hybrids					
Kemal	-	3.8	-	3.3	-
Tandem II	-	3.8	-	3.3	-
Wheatgrasses					
Manska	2.9	-	4.0	-	4.8
Newhy	2.7	-	3.9 ¹	4.2	-
Reliant	3.0	-	4.2	-	5.0
LSD 5%	0.5	0.6	0.6	0.4	NS

¹ Newhy main yield reported for 1993 and 1994. Winter injury was severe at Rosemount in 1994-1995, resulting in stand loss of Newhy and reducing overall varietal yield by 25%.

TIMOTHY

Timothy is adapted throughout Minnesota for use in hay and pasture mixes. When timothy is the major component in hay its stage of maturity affects both yield and quality. Harvesting timothy at early heading is the preferred time. Timothy produces the majority of its forage at the first harvest.

Varieties of timothy differ in maturity, so care should be taken in choosing those that fit the management requirements of the crop and mixture. Early varieties are best adapted to a three-cut system with alfalfa.

Varieties that are intermediate to late maturing should not be harvested more than twice during the growing season. Therefore, appropriately selected timothy varieties are compatible with red clover and birdsfoot trefoil in mixtures for hay production.

Varieties in the experiment station timothy trials were established in pure stands in 1992 at Rosemount and Morris and again at Grand Rapids in 1993. Trials were also established at Rosemount and Grand Rapids in 1999. Trials were harvested two or three times per year.

Nitrogen was applied at all locations in the early spring and after each harvest at a rate of 40 to 50 pounds per acre.

Early maturing varieties of timothy had greater forage production than the late maturing varieties at all locations over all harvest years. Quality forage may be maintained later in the season with the later varieties, however. Timothy is normally less persistent than other cool-season grasses such as reed canarygrass.

Timothy Planting Rate and Date

Bushel Weight, Pounds	45
Seeds/Pound.....	1,234,000
Planting Rate, Pounds/Acre	
In Mixtures.....	3
Planting Rate, Seeds Sq.Ft.	
In Mixtures.....	85
Planting Date	
In Mixtures.....	Use Date for Legume

Dry matter yields, in tons dry matter per acre, of timothy seeded at three locations.

Variety	Grand Rapids		Rosemount		Morris
	1994-1996	2000	1993-1995	2000-2001	1993-1996
Early to intermediate maturity					
Aurora	-	4.3	-	3.5	-
Climax	3.6	4.2	3.8	3.7	4.0
Colt	-	4.2	-	4.0	-
Comtal	3.4	3.7	3.7	3.2	-
Goliath	3.4	-	3.4	-	-
Motim	-	4.1	-	3.7	-
Promesse	-	4.0	-	3.3	-
Timfor	3.5	-	3.8	-	-
Toro	3.7	-	3.9	-	-
Late maturity					
Heidemij	3.5	-	3.0	-	3.5
Hokusen	3.3	-	3.4	-	3.6
LSD 5%	0.4	NS	0.4	0.5	NS

GRAIN CROPS



BARLEY

Barley varieties are compared in replicated trials at Crookston, Morris, St. Paul, Stephen and Roseau. The 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 therefore select one of the 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.

Among those approved varieties, Robust is preferred by industry, although Excel and Foster may be purchased for malt as well. In addition, three new varieties, Drummond, Lacey and Legacy, have recently been approved by AMBA and may be purchased for malt.

Morex is an older, lower-yielding variety; consequently, little or no certified seed is available. Stander was initially approved by AMBA, but is no longer considered a malting variety.

For most producers in the region the FHB disease and the presence of DON in harvested grain are the two most important factors limiting production of malting barley. Currently the only variety with partial resistance to scab is MNBrite, however MNBrite is not approved by AMBA as a malting variety. There are no significant differences among the current malting varieties for resistance to FHB.

General-Purpose Varieties

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 the currently grown varieties. Developed by N.D. AES from crosses involving Azure, Bumper, Hazen and Stander. Released 2000. **PVP (pending)**

Legacy – High yield 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 and slightly better net blotch resistance compared to the currently grown varieties. Developed by Busch-Agricultural Resources Inc. (BARI) from a complex cross involving the parental varieties Bumper, Karl, Manker and Excel. **PVP (pending)**

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 by Minn. AES from crosses involving Robust, Excel and Stander. Released 2000. **PVP (pending)**

Grain yield as a percent of the mean of the varieties in trials from 1999-2001 and for 2001 alone.

Variety	Crookston		Morris		Stephen		St. Paul		Roseau		Mean	
	2001	3-Year	2001	3-Year	2001	3-Year*	2001	3-Year	2001	3-Year*	2001	3-Year
Morex	92	92	86	87	91	87	76	87	102	88	89	88
Robust	101	97	92	95	95	96	93	97	99	88	96	95
Excel	106	–	101	–	112	107	101	–	109	–	106	–
Stander	109	108	107	101	121	114	111	104	103	109	110	107
Foster	94	98	104	100	115	109	99	105	92	106	101	103
MNBrite	97	100	100	105	95	92	96	93	88	97	95	98
Lacey	105	107	98	108	96	105	120	107	103	104	105	106
Drummond	106	97	109	96	72	82	109	107	96	101	98	98
Legacy	91	96	102	101	104	109	95	99	109	–	100	–
LSD (0.05)	18	8	16	8	10	10	15	6	17	11	7	4
Mean, Bu/Acre	100	101	97	91	53	67	86	81	105	90	88	87

* Only two years of data, 2000-2001.

Foster – High yield and medium maturity. Good lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, colorless aleurone and long rachilla hairs. Classified as a malting variety by AMBA. Resistant to spot blotch. Developed by N.D. AES from crosses involving Robust, ND 5570, Glenn and Karl. Released 1995. **PVP (94)**

Excel – High yield and medium maturity. Similar to Robust in lodging resistance. Kernel plumpness lower than Robust. Six-rowed semi-smooth awn, colorless aleurone and long rachilla hairs. Classified as a malting variety by AMBA. Resistant to spot blotch. Developed by Minn. AES from cross involving Robust, Manker and a sister line of Morex. Released 1990. **PVP**

Robust – Medium 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 the AMBA. Robust is currently the six-row variety of choice by the malting and brewing industry. Resistant to spot blotch. Developed by Minn. AES from crosses involving Morex and Manker. Released 1983. **PVP**

Morex – Low yield and medium maturity. Susceptible to lodging. Kernel plumpness intermediate. Six-rowed, semi-smooth awns, short rachilla hairs, colorless aleurone. Awns may drop off as crop approaches maturity. Classified as a malting variety by AMBA. Moderate resistance to spot blotch. Developed by Minn. AES from cross of Cree and Bonanza. Released 1978.

Special-Purpose Varieties

MNBrite – Medium yield and early maturity. Medium lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, colorless aleurone. Not classified as a malting variety. Resistant to kernel discoloration and has some resistance to FHB. Resistant to spot blotch. Developed by Minn. AES. Released 1998. **PVP (pending)**

Description of barley varieties, 1999-2001.

Variety	Type	Heading*	Height, In.	Lodging	Plump, %	Protein, %
Morex	Malt	57	35	Weak	70	13.2
Robust	Malt	58	36	Medium	77	13.5
Excel	Malt	59	34	Medium	75	12.2
Stander	Feed	59	32	Strong	82	12.6
Foster	Malt	57	34	Strong	80	12.0
MNBrite	Feed	58	35	Medium	75	13.8
Lacey	Malt	58	33	Strong	79	12.9
Drummond	Malt	58	34	V. strong	74	12.9
Legacy	Malt	60	34	Medium	67	13.1
No. of Trials		8	9	5	6	3

* Days after planting

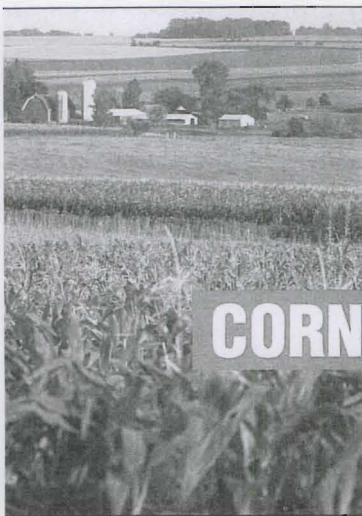
Royal – Intended for use as a forage companion crop and feed grain variety. Not a malting variety. Six-rowed, semi-smooth awn, blue aleurone, semidwarf stature. Superior in forage quality (RFV) compared to taller varieties based on digestibility and intake potential; low in fiber and lignin. Similar 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 by the Minn. AES from crosses involving Robust, Azure and semidwarf Minn. M32. Released 1994. **PVP**

Stander – High 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**

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





CORN GRAIN

Companies participating in the 2001 hybrid corn grain trials.

- Agripro Seeds Inc., Box 250, Brookings, SD 57006
- Albert Lea Seed House (Viking Hybrids), Box 127, 1414 W. Main, Albert Lea, MN 56007
- Anderson Seeds, Rt. 3, Box 94, St. Peter, MN 56082
- Brown Seed Farms Inc., N1279 530th St., Bay City, WI 54723
- Dahlco Seeds, 14730 15th St. SW, Cokato, MN 55321
-
- Dahlman Seed Co., 73504-200th St., Dassel, MN 55325
- Dairyland Seed Co., Inc. (Stealth), Box 958, West Bend, WI 53095
- Monsanto Co. (Dekalb, Asgrow), 3100 Sycamore Rd., De Kalb, IL 60115
-
- Epley Bros. Hybrids, Inc., 22494 Yale Ave., Shell Rock, IA 50670
- Garst Seed Co & Agripro Seeds, 2369 330th St., Box 500, Slater, IA
-
- Gold Country Seed Inc., 16506 Hwy. 15 North, P.O. Box 0604, Hutchinson, MN 55350-0604
- Hyland Seeds, Blenheim, ON, Canada NOP 1A0
- Johnson Seeds Inc., 72700 185th St., Dassel, MN 55325
- Jung Farms Inc., 341 S. High St., Randolph, WI 53956
- Kaltenberg Seed Farms, Inc., 5506 Hwy. 19, Waunakee, WI 53597
-
- Kruger Seed Co., Box A, Hwy. 20 East, Dike, IA 50624
- KSC/Challenger Seed Co., Box A, Dike, IA 50624
- L.G. Seeds Inc., 4001 N. War Memorial Dr., Peoria, IL 61614
- Mallard Seed Co. Inc., 311 West Broadway, Plainview MN 55964
- NC+ Hybrids, Box 4408, Lincoln, NE 68504
-
- Pfister Hybrid Corn Co., 187 N Fayette St., El Paso, IL 61738
- Pioneer Hi-Bred International, Inc., 1919 W. 57th St., Suite 101, Sioux Falls, SD 57108
- RAGT Semences, Ave Saint Pierre - Site de Bourran, FR 12033 RODEZ Cedex 9, France
- Ramy International Ltd., 1329 N Riverfront Dr., Mankato, MN 56001
- Renk Seed Co., 6800 Wilburn Rd., Sun Prairie, WI 53590
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- Renze Hybrids, Inc., RR 3, Box 235, Carroll, IA 51401
- Sand Seed Service, Box 648, 4765 Hwy. 143, Marcus, IA 51035
- Seeds 2000, Box 200, Breckenridge, MN 56520
- Stauffer Seeds, 9802 Nicholas St., Suite 320, Omaha, NE 68114
- Stine Seed Co., 2225 Lareo Trail, Adel IA 50003
-
- Syngenta Seeds (NK Brand), 7500 Olson Memorial Hwy, Golden Valley, MN 55427
- Top Farm Hybrids, Box 850, Cokato, MN 55321
- Trelay, Inc., RR 1, Livingston, WI 53554
- United Suppliers, Inc., 30473 260th St., Box 538, Eldora IA 50627
- Wensman Seed Co., Box 190, Wadena, MN 56482
- Wilson Genetics, LLC, P.O. Box 391, Harlan IA 51537

Hybrids are ranked within a maturity group by moisture content averaged across locations for 2001.

Least Significant Difference

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, they probably do not differ significantly in yield potential.

The Minnesota Corn Hybrid Evaluation program is conducted by the University of Minnesota Agricultural Experiment Station to provide unbiased information for use by corn growers when they choose 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 zones, locations and maturities are:

Southern Zone: Lamberton, Waseca, and Plainview.

Early Maturity Trial – 105 Relative Maturity (RM) and earlier.

Late Maturity Trial – 110 and 115 RM.

Central Zone: Morris and Rosemount.

Early Maturity Trial – 95 RM and earlier.

Late Maturity Trial – 100 and 105 RM.

Northern Zone: Staples and Rothsay.

Testing Procedure: Entries

Each corn seed company could enter up to six hybrids per 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. For this reason, there may be more than six hybrids for a company in a test.

Representation of Data

Yields in tables on pages that follow are given for individual locations along with yields and harvest moisture contents averaged across locations for 2001.

Individual hybrid corn trial information, 2001.

Location	Cooperators	Previous Crop	Planting Date	Harvest Dates
Lamberton	Steve Quiring	Soybean	May 12	October 25
Waseca	Tom Hoverstad	Soybean	May 14	October 24
Plainview	Bruce Ihrke	Soybean	May 9	November 1
Morris	George Nelson	Wheat	May 11	October 19
Rosemount	Jerry Holz	Soybean	May 4	October 31
Staples	Mel Wiens	Corn	May 9	October 17
Rothsay	Troy Larson	Wheat	May 14	October 18

Early-maturity hybrids, southern locations, 2001.

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at			Average Across Locations	
			Lamberton	Plainview	Waseca	Bu/Acre	% Moisture
97 and earlier RM hybrids							
Monsanto / Dekalb	DK440	94	129	202	164	165	19.9
Monsanto / Dekalb	DKC46-26	96	132	179	190	167	20.0
Trelay	4009	95	141	204	168	171	20.2
Kruger	Ex.299D	96	150	207	177	178	20.3
Dahlman	R1720	95	148	206	185	180	20.3
Monsanto / Dekalb	DK440RR/BTY	94	121	209	169	166	20.3
Trelay	7419Bt	97	147	185	149	160	20.3
Monsanto / Dekalb	DKC46-28	96	135	197	167	166	20.5
Wilson	1096	96	152	200	152	168	20.7
Sands	Exp 996-1	96	141	190	169	167	21.2
Viking	7292	97	124	200	166	163	21.5
Pioneer	38A25	96	158	214	165	179	21.5
Kruger	Ex.201	97	120	216	168	168	21.7
97 and earlier RM averages:			138	201	168	169	20.7
98 to 101 RM hybrids							
NK Brand	N43-C4	100	125	198	172	165	19.9
Dahlman	R1730Bt	100	134	208	184	176	20.0
Epley Brothers	E1160	98	147	208	166	174	20.1
Monsanto / Dekalb	DKC48-83	98	140	231	177	182	20.1
Dahlman	1699	100	128	199	161	162	20.1
Top Farm	TFSX8201RR	100	145	219	168	177	20.2
Dahlco	X-0012	101	129	202	176	169	20.3
Monsanto / Dekalb	DKC48-15	98	150	199	171	173	20.4
Dahlman	D50-01	100	151	208	180	180	20.4
Mallard	UC-6171	100	143	199	164	169	20.5
Anderson Seeds	6527	100	139	214	172	175	20.5
Renk	RK622	100	142	211	181	178	20.5
Viking	6270	100	128	207	177	171	20.6
Garst/AgriPro	8779	100	136	210	193	180	20.7
Pioneer	36N70	101	145	210	166	174	20.7
Top Farm	TFSX8103RR	100	150	209	178	179	20.8
Viking	R6206	101	162	223	159	181	21.0
Anderson Seeds	101YR	100	151	218	172	181	21.0
KSC/Challenger	Ex.103	99	161	228	205	198	21.0
Renk	RK636	100	130	228	196	185	21.0

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at			Average Across Locations	
			Lamberton	Plainview	Waseca	Bu/Acre	% Moisture
98 to 101 RM hybrids (continued)							
Top Farm	TFSX2301	100	139	197	170	169	21.1
Trelay	5600	100	140	206	161	169	21.1
Monsanto / Dekalb	DKC51-88	101	142	215	162	173	21.2
Trelay	7525Bt	100	166	233	196	199	21.2
Monsanto / Dekalb	DK507	100	154	202	182	179	21.3
Pfister	1532	98	107	213	176	165	21.3
LG Seeds	LG 2488	100	148	206	168	174	21.3
United Suppliers	US E1012RR	101	156	220	187	188	21.5
<SC / Challenger	K-9104	101	164	231	193	196	21.6
<ruger	Ex.204Bt	101	131	234	184	183	21.6
<SC / Challenger	K-9104ABT	101	125	212	180	172	21.8
<ruger	Ex.203A	99	160	202	170	177	21.8
Garst/AgriPro	8790Bt	100	136	198	171	168	22.0
Jahlco	2502	100	133	212	162	169	22.0
Nensman	W4284	100	161	218	148	176	22.1
Monsanto / Asgrow	Rx452YG	99	140	200	182	174	22.3
LG Seeds	LG 2499	101	119	194	165	160	22.6
Pfister	1680	99	134	213	189	179	23.2
Pfister	2024	101	141	222	169	177	23.7
98 to 101 RM averages:			142	212	175	176	21.1
102 to 104 RM hybrids							
Jahlman	D51-02Bt	102	138	229	202	190	19.8
VK Brand	N45-T5	102	151	211	182	181	20.4
Viking	B16177	102	177	217	172	189	20.6
Top Farm	TFSX2203	103	149	202	170	173	20.6
Brown	5969RR	103	107	220	170	166	20.7
Sands	SOI 4024LL	102	141	191	159	163	21.1
Jahlco	X-0031	103	166	209	181	185	21.1
Top Farm	TFSX105Bt	104	144	216	217	192	21.1
United Suppliers	US C1029Bt	102	167	232	202	200	21.3
Gold Country Seed	X61001	102	149	224	192	188	21.3
Pioneer	36R11	102	152	224	191	189	21.4
Nensman	W4314	102	163	229	183	192	21.5
Epley Brothers	E1470Bt	102	133	158	163	151	21.5
Jahlman	D51-01	102	149	221	199	189	21.6
Anderson Seeds	5028	103	143	211	175	176	21.7
Johnson Seeds	2277	102	149	190	176	172	22.0
Nensman	W5329Bt	102	157	194	163	171	22.0
Nensman	W4362	104	112	200	179	164	22.0
Brown	5282	103	150	195	166	170	22.0
Monsanto / Dekalb	DK537	103	152	231	186	190	22.1
Anderson Seeds	6005	102	150	203	165	172	22.1
Brown	5130	103	146	188	165	167	22.1
Jung	6580Bt	104	143	210	173	175	22.1
Stauffer	2433	102	137	201	172	173	22.2
Trelay	6200	102	160	215	168	181	22.2
<SC / Challenger	Ex.205RR	102	139	228	186	184	22.3
Gold Country Seed	X20200CL	103	133	207	171	170	22.3
<SC / Challenger	K-9104Bt	102	117	211	155	161	22.4

Early-maturity hybrids, southern locations, 2001.

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at			Average Across Locations	
			Lamberton	Plainview	Waseca	Bu/Acre	% Moisture
102 to 104 RM hybrids (continued)							
Viking	6100IMI	102	156	220	170	182	22.5
Stine	9409	102	134	176	156	155	22.7
United Suppliers	US E1042Bt	104	169	207	182	186	22.7
LG Seeds	LG 2521	104	151	210	183	181	22.8
LG Seeds	LG 2512	103	159	210	179	183	22.8
Mallard	UC-2681	103	162	216	192	190	22.9
Dairyland Stealth	1606	104	149	197	174	173	23.0
Dairyland Stealth	1605	103	150	198	180	176	23.2
Dairyland Stealth	1607	104	149	212	170	177	23.2
Top Farm	TFSX2300	103	128	205	189	174	23.3
Kruger	Ex.206D	103	130	205	162	165	23.4
Kruger	Ex.206	102	148	203	179	177	23.6
Sands	SOI 9041	104	145	209	171	175	24.0
Epley Brothers	E1493	103	172	197	186	185	24.1
Monsanto / Dekalb	DKC53-32	103	155	233	178	189	24.2
Stine	9509	104	138	152	143	144	24.3
102 to 104 RM averages:			147	207	177	177	22.2
Southern locations, early-maturity averages:			144	208	175	176	21.6
LSD(0.20)			25	15	15	11	0.7

Late-maturity hybrids, southern locations, 2001.

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at			Average Across Locations	
			Lamberton	Plainview	Waseca	Bu/Acre	% Moisture
Later than 104 RM hybrids							
NC+ Hybrids	2399B	105	147	181	172	167	21.6
Dahlco	2660	105	138	216	200	185	21.7
Renk	RK668	105	151	237	177	188	21.8
Epley Brothers	E2433	108	187	214	185	196	21.9
Kruger	Ex208A RR	105	145	216	189	183	22.5
Jung	2671	106	159	211	189	186	22.5
Monsanto / Asgrow	Rx634	106	155	211	172	180	22.7
Anderson Seeds	4033	106	151	207	160	173	22.7
Gold Country Seed	X10008	106	169	224	175	189	22.8
Dahlco	2680	105	156	208	177	180	22.8
NC+ Hybrids	3448	110	161	194	182	179	22.9
Garst	8647	105	141	231	175	182	23.0
Pioneer	35Y55	106	129	234	181	181	23.1
Kruger	K-9108+Bt	105	140	214	197	184	23.1
Ramy	R5535	105	152	215	171	179	23.2
Jung	2674	108	153	226	162	181	23.2
Renk	RK806	110	151	222	140	171	23.4
Anderson Seeds	4020	106	157	221	184	187	23.6
Wensman	W4388	105	152	230	146	176	23.6
Viking	5250	105	147	194	169	170	23.6
United Suppliers	US C1051ND	105	150	199	175	175	23.6
Pfister	2296	105	156	212	171	179	23.7
Jung	2612	105	158	179	187	175	23.7
Wensman	W4424	107	157	214	180	183	23.8

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at			Average Across Locations	
			Lamberton	Plainview	Waseca	Bu/Acre	% Moisture
Later than 104 RM hybrids (continued)							
Ophey Brothers	E2418	106	146	200	165	170	23.9
Cruiger	Ex.208	105	169	217	184	190	24.0
Mallard	UC-2682	106	158	187	181	175	24.1
United Suppliers	US C1059	105	145	214	167	175	24.3
Samy	R1590	109	139	196	194	176	24.3
IK Brand	N5909	108	139	209	183	177	24.3
United Suppliers	US C1099	109	161	191	172	175	24.3
Harst / AgriPro	8590 IT	106	168	217	183	189	24.4
Brown	6341	105	164	220	170	185	24.5
Monsanto / Dekalb	DKC57-38	107	147	219	126	164	24.5
Brown	6895Bt	108	152	192	179	174	24.5
AgriPro	9476Bt	108	148	193	180	173	24.6
Dairyland Stealth	1507	105	157	184	177	172	24.8
Relay	7095	105	125	190	182	166	25.0
Vensman	W4418	106	145	197	180	174	25.7
G Seeds	LG 2533	105	165	201	211	192	25.9
Titine	9614Bt	109	160	169	146	158	27.2
Southern locations, late maturity averages:			152	207	175	178	23.7
SD(0.20)			19	16	18	10	0.9

Early-maturity hybrids, central locations, 2001.

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations		
			Morris	Rosemount	Bu/Acre	% Moisture	
12 and earlier RM hybrids							
Op Farm	TFSX8184RR	85	166	108	137	18.4	
Monsanto / Dekalb	DKC35-50	85	175	116	145	19.0	
Monsanto / Dekalb	DKC39-45	91	206	138	172	20.5	
Op Farm	TFSX2390	90	172	89	130	20.6	
Monsanto / Dekalb	DKC39-47	91	209	128	169	20.7	
Monsanto / Dekalb	DKC42-70	92	217	123	170	20.7	
Harst	N9943	90	166	105	136	21.1	
Mallard	UC-593	92	179	115	147	21.2	
Cruiger	Ex.96(2096)	92	197	112	154	22.0	
Shlman	D45-01Bt	90	172	103	138	22.0	
Monsanto / Dekalb	DKC42-22	92	233	146	190	22.3	
12 RM and earlier averages:			190	117	153	20.8	
13 to 97 RM hybrids							
enck	RK404	93	197	104	150	20.0	
Harst	N9946	93	204	133	169	20.2	
Shlco	2394	94	193	131	162	20.4	
Op Farm	TFSX2295	95	211	110	160	20.5	
Vensman	W5258Bt	95	175	116	146	20.8	
Vensman	W4164	93	207	102	155	20.8	
Anderson Seeds	376Y	96	164	114	139	20.8	
Monsanto / Dekalb	DK440	94	222	125	173	21.1	
Ophey Brothers	E1130	95	191	99	145	21.1	
enck	RK546	95	178	136	157	21.2	
Brown	4641	96	180	91	135	21.3	
G Seeds	LG 2474	96	180	111	145	21.5	

Early-maturity hybrids, central locations, 2001 (continued).

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations	
			Morris	Rosemount	Bu/Acre	% Moisture
93 to 97 RM hybrids (continued)						
Mallard	UC-2420	96	216	162	189	21.6
Trelay	7419Bt	97	199	113	156	21.6
LG Seeds	LG 2442	95	223	113	168	21.7
Dahlman	R1720	95	203	100	152	21.8
Dahlco	X-9963	96	229	135	182	21.8
Wensman	Max007	93	202	126	164	21.9
Sands	Exp 996-1	96	214	120	167	21.9
Top Farm	TFSX2297	97	182	80	131	21.9
United Suppliers	US C971CL	97	190	104	147	21.9
Renk	RK556	96	198	121	160	21.9
United Suppliers	US C969	96	185	102	144	21.9
Renk	RK569	97	177	102	139	21.9
Gold Country Seed	X60094	94	213	139	176	21.9
Trelay	4009	95	218	131	175	22.0
Dahlco	2480	96	169	114	142	22.0
Gold Country Seed	X49896LL	96	189	107	148	22.0
Wensman	Max127	97	180	100	140	22.0
Pioneer	38A25	96	186	129	157	22.1
Anderson Seeds	375R	95	180	118	149	22.1
United Suppliers	US E952	95	200	136	168	22.2
Pioneer	38T28	96	190	103	146	22.2
Seeds 2000	X2953	95	207	126	166	22.3
Monsanto / Dekalb	DKC44-42	94	234	134	184	22.3
Dahlco	2475	96	153	95	124	22.3
NK Brand	N3030Bt	95	180	124	152	22.4
Kruger	Ex.299D	96	215	123	169	22.4
Garst	8801IT	96	181	121	151	22.5
Wensman	W4212	95	209	128	169	22.5
Monsanto / Dekalb	DKC46-28	96	221	151	186	22.9
Monsanto / Dekalb	DKC46-26	96	221	131	176	22.9
Dairyland Stealth	1598	96	195	108	151	22.9
Johnson Seeds	2165	95	196	136	166	23.0
Monsanto / Dekalb	DK440RR/BTY	94	209	110	159	23.1
Kruger	Ex.299RR	96	191	113	152	23.5
Kruger	Ex.201	97	209	123	166	23.8
93 to 97 RM averages:			197	118	158	21.9
98 and later RM hybrids						
Top Farm	TFSX2201	99	196	109	152	21.2
Dahlman	1699	100	172	117	144	21.2
Hyland Seeds	HL2505	98	170	90	130	21.3
Epley Brothers	E1160	98	180	110	145	21.5
Dahlman	D50-01	100	196	132	164	21.7
Anderson Seeds	6527	100	208	92	150	21.8
Hyland Seeds	HL2507	100	167	116	141	21.9
Ramy	R5495	100	187	113	150	21.9
Renk	RK622	100	215	113	164	22.0
Dairyland Stealth	1499	99	212	120	166	22.2
Mallard	UC-6171	100	171	106	138	22.2
Monsanto / Dekalb	DKC48-15	98	211	130	170	22.2

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations	
			Morris	Rosemount	Bu/Acre	% Moisture
18 and later RM hybrids (continued)						
DK Brand	N43-C4	100	211	139	175	22.3
Top Farm	TFSX2301	100	204	98	151	22.4
Harst / AgriPro	8779	100	210	136	173	22.5
Top Farm	TFSX8201RR	100	170	102	136	22.5
Relay	5600	100	196	102	149	22.5
Monsanto / Dekalb	DKC48-83	98	220	131	176	22.5
Seeds 2000	2981	98	180	107	143	22.6
Kaltenberg Seeds	K5151Bt	99	222	121	171	22.6
Agri Semences	PG006	98	229	141	185	22.7
Long	6455Bt	99	191	135	163	22.8
Jahlman	R1730Bt	100	202	130	166	22.8
Johnson Seeds	2245RR	100	207	82	145	22.9
LG Seeds	LG 2488	100	185	100	143	22.9
Relay	7525Bt	100	218	164	191	23.1
Penk	RK606	100	191	100	145	23.1
Hyland Seeds	HLB310	100	210	103	156	23.3
Monsanto / Dekalb	DK507	100	187	90	139	23.3
Top Farm	TFSX2299	100	187	111	149	23.4
Brown	4P47	98	214	124	169	23.5
Long	2488A	98	197	105	151	23.6
ISC / Challenger	Ex.203-1	99	196	97	146	23.6
ISC / Challenger	Ex.103	99	186	100	143	23.9
ISC / Challenger	Ex201RR	98	197	112	155	23.9
Cruger	Ex.203A	99	188	112	150	24.1
Vensman	W4284	100	184	126	155	24.1
Wfister	1532	98	186	118	152	24.1
Penk	RK636	100	178	117	148	24.3
LG Seeds	LG 2484	99	215	104	159	24.3
Hyland Seeds	HL2614	100	174	102	138	24.4
Relay	5020	100	203	136	170	24.4
Kaltenberg Seeds	K5123	99	197	122	160	25.2
Wfister	1680	99	187	126	156	25.5
Harst / AgriPro	8790Bt	100	200	126	163	25.5
Monsanto / Asgrow	Rx452YG	99	212	146	179	25.5
18 and later RM averages:			196	116	156	23.1
Central locations, early maturity averages:			196	117	156	22.3
SD(0.20)			19	23	15	0.6

Late-maturity hybrids, central locations, 2001.

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations	
			Morris	Rosemount	Bu/Acre	% Moisture
02 and earlier RM hybrids						
DK Brand	N45-T5	102	154	168	161	20.9
Long	6560RR/Bt	102	184	146	165	21.4
United Suppliers	US E1012RR	101	198	153	175	21.5
Jahlman	D51-02Bt	102	177	173	175	21.5
Seeds 2000	3110RRBt	101	187	162	175	22.0
Vensman	W4314	102	199	155	177	22.5
Vensman	W5329Bt	102	170	169	170	22.6
Relay	6200	102	204	142	173	22.6

Late-maturity hybrids, central locations, 2001 (continued).

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations	
			Morris	Rosemount	Bu/Acre	% Moisture
102 and earlier RM hybrids (continued)						
Epley Brothers	E1470Bt	102	179	154	166	22.9
Kruger	Ex.204	101	191	169	180	23.1
Monsanto / Dekalb	DKC51-88	101	217	155	186	23.1
Jung	2573	102	172	163	167	23.3
Jung	2507	101	195	158	176	23.4
Johnson Seeds	2277	102	179	145	162	23.5
United Suppliers	US C1029Bt	102	217	166	192	23.5
Dahlman	D51-01	102	205	167	186	23.6
Kruger	Ex.204Bt	101	198	179	188	23.7
Trelay	6501	102	196	173	184	23.9
Stine	9409	102	183	139	161	23.9
Dairyland Stealth	1503	102	205	173	189	24.1
KSC/Challenger	K-9104ABT	101	172	170	171	24.1
KSC/Challenger	K-9104Bt	102	177	180	178	24.3
Johnson Seeds	2287	102	185	151	168	24.4
Kruger	Ex.206	102	213	139	176	25.1
Pfister	2024	101	175	173	174	25.2
102 RM and earlier averages:			189	161	175	23.2
Later than 102 RM hybrids						
Ramy	R5535	105	185	142	164	22.7
Monsanto / Dekalb	DK537	103	189	174	181	23.4
Wensman	W4388	105	194	145	169	23.9
Jung	2565	103	192	178	185	24.0
United Suppliers	US E1042Bt	104	167	171	169	24.3
Monsanto / Dekalb	DKC53-32	103	225	169	197	25.0
Epley Brothers	E1493	103	206	155	181	25.3
Epley Brothers	E2418	106	198	163	180	25.4
Wensman	W4362	104	172	156	164	25.6
Stine	9509	104	159	132	146	25.8
Stine	9614Bt	109	181	154	168	30.4
Later than 102 RM averages:			188	158	173	25.0
Central locations, late maturity averages:			189	160	174	23.8
LSD(0.20)			24	13	14	0.6

Northern locations, 2001.

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations	
			Rothsay	Staples	Bu/Acre	% Moisture
77 and earlier RM hybrids						
Top Farm	TFSX2376	76	138	131	135	20.9
Hyland Seeds	HLX1015	74	65	103	84	22.1
Hyland Seeds	HL2093	76	96	108	102	22.5
77 and earlier RM averages:			100	114	107	21.8
78 to 82 RM hybrids						
Dairyland Stealth	1279	79	137	128	133	20.1
Hyland Seeds	HL2222	79	99	110	105	20.9
Ragt Semences	PG001	80	123	136	129	21.8
NK Brand	WT7-R3	82	123	144	133	21.8

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations	
			Rothsay	Staples	Bu/Acre	% Moisture
78 to 82 RM hybrids (continued)						
Ragt Semences	FG002	82	130	150	140	24.7
Ragt Semences	FG003	82	92	131	111	25.0
78 to 82 RM averages:			117	133	125	22.4
83 to 87 RM hybrids						
Monsanto / Dekalb	DKC35-50	85	155	148	151	19.7
Dahlco	2286	83	143	138	140	19.8
Monsanto / Dekalb	DKC33-08	83	132	122	127	19.9
Dairyland Stealth	1585	87	133	136	135	20.6
Monsanto / Dekalb	DKC37-81	87	139	131	135	20.7
Brown	2M10	85	143	129	136	20.9
Top Farm	TFSX8184RR	85	121	129	125	20.9
Seeds 2000	2861	86	141	142	142	21.1
LG Seeds	LG 2354	84	132	151	142	21.1
Dahlco	X-0851	85	152	144	148	21.1
Trelay	2002	84	133	138	136	21.1
Brown	2710RR	85	124	142	133	21.1
Benk	RK232	85	167	160	164	21.2
Top Farm	TFSX2183	84	138	136	137	21.2
Seeds 2000	2841RR	84	115	135	125	21.2
Benk	RK232RR	86	141	135	138	21.4
Pioneer	39K40	85	133	154	144	21.5
Dahlman	D43-01	86	150	153	152	21.7
Nensman	W5048Bt	83	119	124	122	21.9
Johnson Seeds	2120	85	148	141	144	21.9
Dairyland Stealth	1485	85	145	138	142	22.1
Johnson Seeds	8555	85	127	133	130	22.1
Ramy	R-5105	85	145	156	151	22.1
Brown	2P16	87	140	130	135	22.1
Dahlman	R1700	86	143	148	145	22.4
LG Seeds	LG 2367	85	116	149	133	22.4
Jung	6240Bt	83	147	127	137	22.6
United Suppliers	US C871	87	146	124	135	22.7
Jung	6210RR/Bt	87	156	120	138	22.8
Dairyland Seeds	HL2251	86	112	123	118	22.9
Nensman	W5088Bt	85	136	154	145	23.1
Kruger	K-8190Bt	87	140	160	150	23.4
Kruger	Ex.092Bt	87	165	168	166	23.9
83 to 87 RM averages:			139	140	139	21.6
88 to 92 RM hybrids						
Mallard	UC-X2400	90	137	150	143	21.0
Dairyland Seeds	HL2307	91	121	145	133	21.1
LG Seeds	LG 2402	89	128	133	131	21.4
Jung	2370	90	140	134	137	21.5
Monsanto / Dekalb	DKC39-47	91	154	184	169	21.5
Benk	RK383	90	138	149	144	21.5
Dairyland Stealth	1089Bt	90	106	145	125	21.7
Ragt Semences	PG005	89	156	138	147	21.7
Dairyland Stealth	1592	92	139	135	137	21.8
Dairyland Seeds	HLB275	89	142	141	142	22.4
Monsanto / Dekalb	DKC39-45	91	186	140	163	22.6
Dairyland Seeds	HL2371	89	118	138	128	22.8

Northern locations, 2001 (continued).

Source / Brand	Hybrid	Relative Maturity	Yield, Bushels/Acre at		Average Across Locations	
			Rothsay	Staples	Bu/Acre	% Moisture
88 to 92 RM hybrids (continued)						
NK Brand	N27-M3	91	126	170	148	23.2
Hyland Seeds	HL2419	90	130	149	140	23.2
Seeds 2000	2881Bt	88	83	131	107	23.3
Dahlco	2335	90	123	157	140	23.4
Dahlman	D45-01Bt	90	166	166	166	23.5
Johnson Seeds	2235	90	122	156	139	23.7
Monsanto / Dekalb	DKC42-70	92	189	170	179	23.8
Seeds 2000	2892Bt	90	174	167	170	23.9
Mallard	UC-593	92	110	178	144	24.2
Gold Country Seed	X21085RRBT	88	162	167	164	24.4
Jung	6320RR	90	136	141	139	24.7
Monsanto / Dekalb	DKC42-22	92	184	181	182	25.5
88 to 92 RM averages:			140	153	147	22.8
93 and later RM hybrids						
Wensman	W5258Bt	95	132	150	141	23.2
Brown	3P32	93	130	152	141	23.3
Renk	RK404	93	144	146	145	23.6
Monsanto / Dekalb	DK440	94	166	159	163	24.3
Seeds 2000	2932RR	93	113	134	123	24.8
Seeds 2000	X2953	95	172	162	167	25.3
Wensman	W4164	93	155	146	151	25.4
Jung	2432	94	157	155	156	25.6
LG Seeds	Ex42-242	93	138	149	143	25.6
Kaltenberg Seeds	K4664	96	152	174	163	26.0
United Suppliers	US E952	95	150	169	159	26.0
Kruger	Ex.299D	96	159	149	154	26.1
Wensman	Max007	93	161	156	158	26.1
Wensman	W4212	95	159	138	149	26.1
Monsanto / Dekalb	DK440RR/BIY	94	189	176	183	26.4
Gold Country Seed	X60094	94	137	174	156	26.7
Kaltenberg Seeds	K4707	97	160	156	158	26.8
Kruger	Ex.299RR	96	160	161	161	29.7
93 and later RM averages:			152	156	154	25.6
Northern locations averages:			139	146	142	22.9
LSD(0.20)			1.7	1.7	1.2	0.8

Corn Planting Rate and Date

Bushel Weight, Pounds56
 Planting Rate, Seeds/Acre33,000
 Planting DateApril 15 - May 5



CORN SILAGE

The Minnesota Hybrid Corn Silage Evaluation Program was initiated as a test to evaluate corn hybrids intended for use as silage. Unbiased forage yield and quality information provided by this program will be useful in education activities and in marketing corn hybrids grown for silage. The program is financed in part by entry fees from private seed companies that chose to enter hybrids for testing. New results this year include presentation of hybrid data for 48-hour digestible neutral detergent fiber, (dNDF) and starch concentration. Also, milk production (milk per ton and milk per acre field) is calculated using the improved MILK2000™ spreadsheet.

Test Sites

Trials were conducted at Rosemount and Waseca in 2001. Locations and maturity categories were:

Southern Zone: Waseca

Early maturity group - Hybrids rated 105-day Relative Maturity (RM) and earlier.

Late maturity group - Hybrids rated later than 105-day RM.

Central Zone: Rosemount

Early maturity group - Hybrids rated earlier than 100-day RM.

Late maturity group - Hybrids rated 100-day RM or later.

Test Procedure

Design: Plots were established at Waseca and Rosemount in randomized block designs with five replications. Hybrids were planted at 33,000 seeds per acre with 30-inch row spacing. Standard check hybrids were included to represent the RM groups at each location.

Harvesting: Plots were harvested and whole-plant (WP) herbage sampled for yield and forage quality determination for each RM group. The WP target maturity was a moisture content of 60% to 65%. Harvest at Waseca was on 24 September for the early RM group and 27 September for the late RM group. Harvest at Rosemount was on 30 August for the early RM group and 4 September for the late RM group. After grain maturation, two rows adjacent to those sampled for silage were harvested for grain and yields adjusted to 15.5% moisture.

Results Provided

Moisture content, grain yield (Grn), whole-plant dry matter (DM) and silage (Sil) yield, crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), *in vitro* digestibility (IVD), 48-hour digestible neutral detergent fiber (dNDF) and starch concentrations are given for entries in each RM group.

Milk parameter estimates of milk per ton (Ton) and milk per acre (Acre) were calculated using a model from the spreadsheet entitled, "MILK2000," developed at the University of Wisconsin. They approximate animal performance using pounds of milk per ton of silage and per

acre of cropland for a given hybrid based on standard cow weight and milk production level (1,350 lb. body weight and 90 lb/day at 3.8% fat). Hybrid moisture, DM yield, and CP, NDF and dNDF quality concentration are used for the spreadsheet calculations.

Means and least significant difference (LSD) statistical figures at the 10% level of probability are shown for each RM group at each location. Where the difference between two selected hybrids in a table is greater than the LSD value, 9 out of 10 times there is a real difference for that parameter (moisture, yield or quality concentration). Hybrids are ranked by average moisture content.

How to Use Results

Hybrids differ in grain and silage yields, and milk production per acre estimates; however, there was little difference in forage quality parameters (ADF and IVD) and milk production per ton estimates. ADF and NDF are negative indicators of forage digestibility and intake respectively. Lower ADF and NDF numbers are related to better animal performance.

IVD is a laboratory test to estimate digestibility in ruminant livestock, and dNDF estimates digestibility of the cell-wall fraction. IVD, dNDF and starch have a positive effect on animal performance. Starch concentration is associated with corn silage digestion because it is assumed to be 100% digestible.

Grain, silage and milk yields at Rosemount were reduced in 2001 by a prolonged drought.

Companies participating in the 2001 hybrid corn silage trials:

Albert Lea Seed House, 1414 W. Main, P.O. Box 127, Albert Lea, MN 56007

Dahlco Seeds, Inc., 14730 15th St. SW, Cokato, MN 55321

Dairyland Seed Company, Inc., P.O. Box 958, West Bend, WI 53095-0958

Epley Brothers Hybrids Inc., 22494 Yale Avenue, P.O. Box 310, Shell Rock, IA 50670

Trelay Seed Company, 11623 Hwy. 80, Livingston, WI 53554-9799

Moisture, yield and quality traits for early relative maturity (RM) corn hybrids at Waseca, 2001.*

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Pioneer	36R11 (check) ³	102	58	180	7.6	18.4	7.4	21	37	72	48	40	3,451	25,968
Epley Bros	E1505 S	105	60	147	7.0	17.5	7.5	23	40	69	52	36	3,359	23,662
Dahlco	2660	105	61	174	8.8	22.7	7.2	21	38	70	52	40	3,439	30,289
Dahlco	X-100L	100	61	144	7.2	18.5	7.6	22	38	69	50	37	3,349	24,134
Dairyland	Stealth 1406	103	62	174	8.0	21.4	7.3	20	35	69	50	43	3,406	27,324
Trelay	6900	103	62	164	7.4	19.5	7.0	21	36	72	50	40	3,435	25,342
Dairyland	Stealth 1507	105	63	172	8.3	22.2	7.9	20	35	71	58	42	3,884	32,126
Trelay	7095	105	63	180	8.1	22.0	7.3	21	37	69	52	40	3,524	28,768
Early RM Averages			61	167	7.8	20.2	7.4	21	37	70	51	40	3,481	27,202
LSD (0.10)			2	10	1.0	2.6	ns	1	2	ns	ns	3	ns	4,949

*Whole-plant (WP) corn harvested September 24.

Moisture, yield and quality traits for late relative maturity (RM) corn hybrids at Waseca, 2001.*

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Viking	Fodder	110	64	159	7.0	19.4	7.0	25	43	65	45	34	2,994	21,289
Epley Bros	E5112	112	64	161	6.5	18.3	6.5	27	47	63	42	31	2,547	16,622
High Cycle	7638BT	107	65	162	7.3	20.6	6.7	26	45	64	48	30	3,023	21,764
Pioneer	35Y55 (check) ³	106	66	177	6.4	18.9	7.7	26	43	65	48	31	3,064	19,591
Dairyland	Stealth 1611	111	67	161	6.6	20.3	7.0	27	47	61	47	29	2,933	19,456
Late RM Averages			65	164	6.8	19.5	7.0	26	45	63	46	31	2,912	19,744
LSD (0.10)			2	10	ns	ns	0.6	ns	2	2	ns	ns	ns	ns

*Whole-plant (WP) corn harvested September 27.

Moisture, yield and quality traits for early relative maturity (RM) corn hybrids at Rosemount, 2001.*

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Pioneer	38A25 (check) ³	96	60	120	6.1	15.3	7.5	27	49	61	40	30	2,367	14,564
Dairyland	Stealth 1297	97	60	106	5.7	14.2	7.2	30	52	57	44	28	2,473	13,895
Trelay	5600	98	64	98	5.7	16.1	8.3	29	53	58	45	22	2,680	15,364
Early RM Averages			61	108	5.8	15.2	7.7	28	51	58	43	27	2,507	14,608
LSD (0.10)			ns	12	ns	0.9	ns	ns	ns	ns	4	6	ns	719

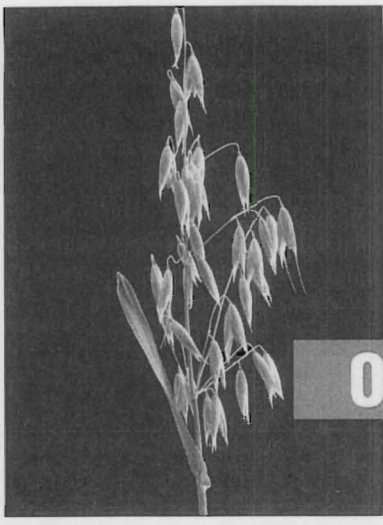
*Whole-plant (WP) corn harvested August 30.

Moisture, yield and quality traits for late relative maturity (RM) corn hybrids at Rosemount, 2001.*

Brand	Hybrid	RM, Days	Moisture, %	Yield Per Acre ¹			Concentration, Percent ²						Milk Yield ²	
				Grain, Bushels	DM, Tons	Silage, Tons	CP	ADF	NDF	IVD	dNDF	Starch	lb/Ton	lb/Acre
Dairyland	DST 10233	100	58	93	5.7	13.7	7.9	25	45	66	46	34	2,691	15,327
Epley Bros	E5105 S	105	59	91	6.5	16.1	8.3	26	47	62	49	29	2,799	18,504
Pioneer	36R11 (check) ³	102	61	113	6.0	15.4	7.9	24	44	63	47	35	2,874	17,287
Dairyland	Stealth 1606	104	62	112	6.5	16.9	7.3	26	46	62	54	30	3,212	20,640
Trelay	6900	103	62	91	5.6	14.8	8.2	26	46	62	49	29	2,925	16,448
Late RM Averages			60	100	6.1	15.4	7.9	25	45	63	49	31	2,900	17,641
LSD (0.10)			ns	11	0.6	1.9	0.6	ns	ns	ns	5	ns	319	2,546

*Whole-plant (WP) corn harvested September 24.

Footnotes for all corn silage tables: ¹ DM yield is WP yield at 100% dry matter. Silage yield is WP yield at harvest moisture. Grain harvested after maturation and yields adjusted to 15.5% moisture. ² Refer to Results Provided text for description. ³ (check) - standard check entry.



Groat percent is an important consideration for grain production, perhaps equal to grain yield, whether for food or feed. Lodging can be site-specific; varieties with lodging scores above 2.5 should be chosen cautiously if soil is highly fertile. Taller varieties may generally produce more forage and/or straw. Earlier varieties tend to perform relatively better in more southerly parts of the state while later varieties usually have an advantage in the north.

General-Purpose Varieties

Belle – Late maturity, high yield, tall, fair lodging resistance, high test weight and very high groat percentage. Yellow seed. Resistant to crown rust and smut, some tolerance to red leaf. Selected at the Wis. AES. Released in 1995. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

Dane – Early maturity, lower yield, short, good lodging resistance, fair test weight, high groat percentage. Yellow seed. Moderately resistant to crown rust and smut, susceptible to red leaf. Selected at the Wis. AES. Released in 1990. Foundation seed available to certified

seed producers only under a license/fee collection agreement. **PVP**

Gem – Medium-late maturity, high yield, medium height, good lodging resistance, high test weight and groat percentage. Yellow seed. Resistant to crown rust and smut, good tolerance to red leaf. Selected at Wis. AES. Released in 1995. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (pending)**

Jerry – Medium maturity, medium yield, tall, good lodging resistance, very high test weight, high groat percentage. Ivory seed. Moderately susceptible to crown rust, susceptible to smut, tolerant to red leaf. Selected at N.D. AES. Released in 1994. Because of smut susceptibility, planting only treated seed is recommended. **PVP (94)**

Jim – Early maturity, lower yield, short, good lodging resistance, high test weight and groat percentage. Yellow seed. Small resistance to crown rust, resistant to smut, good tolerance to red leaf. Selected at Minn. AES. Released in 1996.

Jud – Late maturity, high yield, very tall, poor lodging resistance, very high test

Proper selection of oat varieties requires consideration of the anticipated growing conditions, the pests that might be encountered in a specific production situation and the purpose for growing the crop. Specific growing situations will dictate the priority and emphasis given to each trait included in the tables.

Generally, crown rust is the most important disease and detailed interpretation of our data follows. We divided the rust reading into columns beneath “Crown Rust” headed “Amount Infected” and “Reaction Type.” The value in the Crown Rust Amount column predicts the relative proportion of rust spores that achieve a successful infection. The Reaction Type value gives the size of the pustule, which indicates how the pustule is restricted by the host reaction. A small and/or restricted pustule produces fewer spores for reinfection.

Depending upon the plant growth stage at initial infection, there can be one to three cycles of reinfection during an oat-growing season. Each infection cycle is 8 to 10 days long. The final amount of rust infection depends upon both the number and size of spore-producing pustules present to cause subsequent infections. It is these later infections that really damage the plant.

Treated seed should be used for smut-susceptible varieties and those with BYDV (red leaf) susceptibility (score of 6 or higher) should be chosen carefully.

Oat yield, percent of nursery average, by location, 2000-2001.

Variety ¹	Rosemount	Lamberton	Morris	Crookston	Grand Rapids	Average of	
						5 locations	Waseca ²
Moraine ²	103	99	84	95	87	92	112
Chaps	99	90	103	98	107	100	108
Jay	98	96	102	96	90	97	110
Richard	103	110	105	100	103	104	107
Gem	99	110	106	101	94	103	107
Wabasha	99	97	101	106	98	100	95
Rodeo	108	97	118	101	116	108	101
Kildeer	92	97	93	95	115	98	101
Vista	117	111	111	110	96	109	126
Milton	106	96	87	94	102	96	104
Sesqui	108	103	106	113	99	106	107
Youngs	101	98	98	94	95	97	97
Jud	97	104	96	96	123	102	100
Loyal	95	104	104	102	107	103	109
Belle	100	106	90	101	95	98	108
Paul (hullless)	54	62	69	78	54	65	41
Ebeltoft	102	101	110	108	110	107	90
AC Assiniboia	101	105	111	105	101	105	106
Mean, Bu/Acre	75	90	131	107	83	97	103
LSD	11	15	13	12	17	6	13

¹ Order is by maturity, early to late. ² 2001 data only.

weight and groat percentage. White seed. Resistant to crown rust and smut, good tolerance to red leaf. Selected at N.D. AES. Released in 1998.

Loyal – Late maturity, high yield, tall, fair lodging resistance, medium test weight and groat percentage. Ivory seed. Modest resistance to crown rust and smut, susceptible to red leaf. Selected at the S.D. AES. Released in 2000.

Milton – Medium-late maturity, high yield, medium height, good lodging resistance, medium test weight and groat percentage. Yellow seed. Modest resistance to crown rust, resistant to smut, susceptible to red leaf. Selected at Minn. AES. Released in 1994.

Richard – Early maturity, high yield, tall, good lodging resistance, high test weight and groat percentage. Yellow seed. Good resistance to crown rust and smut and good 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. Resistant to crown rust and smut, susceptible to red leaf. Selected at S.D. AES. Released in 1998. **PVP (pending)**

Rodeo – Medium-late maturity, high yield, good lodging resistance, fair test weight, high groat percentage. Yellow seed. Susceptible to crown rust and smut, tolerant to red leaf. Selected at Ill. AES. Released in 1996. Because of smut susceptibility, planting only treated seed is recommended. **PVP (pending)**

Sesqui – Late maturity, high yield, medium height, good lodging resistance, very high test weight, medium groat percentage. Yellow seed. Moderately resistant to crown rust, resistant to smut and good tolerance to red leaf. Selected at Minn. AES. Released in 2001.

Troy – Medium maturity, high yield, tall, poor lodging resistance, low test weight, medium groat percentage. White seed. Moderately susceptible to crown rust, resistant to smut and good tolerance to red leaf. Selected at S.D. AES. Released in 1991.

Vista – Medium maturity, high yield, tall, fair lodging resistance, medium test weight and groat percentage. Yellow seed. Resistant to crown rust and smut, susceptible to red leaf. Selected at Wis. AES. Released in 1999. **PVP (pending)**

Wabasha – Medium maturity, high yield, tall, good lodging resistance, high test weight and groat percentage. White seed. Moderately susceptible to crown rust, resistant to smut and tolerant to red leaf. Selected at Minn. AES. Released in 2001. **PVP (pending)**

Relative grain yield of oat varieties in Minnesota in single-year (2001) comparisons at five on-farm locations.

Variety ¹	Yield, Percent of Mean					Average
	Roseau	Stephen	Winona ²	Wells ²	Madison ²	
Moraine	85	107	96	129	87	101
Chaps	101	110	98	111	100	103
Jay	101	94	112	114	106	104
Richard	100	103	104	94	126	101
Gem	97	105	118	122	115	110
Wabasha	94	96	92	104	110	96
Rodeo	88	97	104	124	145	105
Kildeer	74	124	91	114	125	101
Vista	102	131	120	110	97	113
Milton	92	81	104	99	84	93
Sesqui	108	111	112	101	138	109
Youngs	124	68	87	92	58	89
Jud	104	102	91	76	92	93
Loyal	133	103	102	98	93	107
Belle	99	116	104	98	96	103
Paul (hullless)	99	74	67	28	58	66
Ebeltoft	110	97	89	107	116	100
AC Assinibioa	106	126	110	79	95	104
Riser	–	–	–	–	59	–
AC Rebel	83	58	–	–	–	–
Mean, Bu/Acre	72	65	89	58	52	82
LSD (0.05)	26	20	18	24	32	8

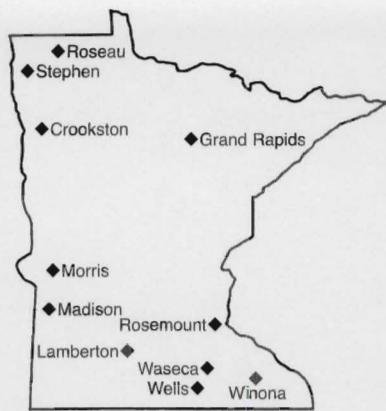
¹ Varieties are listed from earliest to latest heading date.

² Pesticide-free/organic production; Madison was also no-till.

Oat yield, percent of nursery average, by location, 1998-2001.

Variety ¹	Rosemount	Lamberton	Morris	Crookston	Average of	Waseca ²	Grand Rapids ³
					4 locations	3 yrs.	3 yrs.
Chaps	103	96	109	94	101	108	110
Jay	100	86	110	98	99	102	92
Richard	104	103	101	103	102	101	109
Wabasha	107	99	106	111	106	101	103
Gem	100	111	104	100	103	105	99
Rodeo	110	101	116	104	108	101	113
Milton	101	93	95	100	97	96	102
Sesqui	112	100	104	115	107	106	104
Jud	103	109	89	92	97	92	116
Belle	99	102	93	99	97	103	95
Loyal	95	102	95	99	97	105	102
Paul (hullless)	52	72	64	76	67	55	43
Mean, Bu/Acre	77	99	140	118	108	91	92
LSD	8	11	10	10	5	10	13

¹ Order by maturity, early to late. ² Waseca data from 2001, 1999 and 1998 only. ³ Grand Rapids data from 2001, 2000 and 1998 only.



Oat Trial Locations.

Special-Purpose Varieties

Paul – Hulless. Medium-late maturity, high yield for hulless cultivar, tall, very good lodging resistance; hulless, so very high test weight. Moderately susceptible to crown rust, resistant to smut, moderately susceptible to red leaf. Selected at N.D. AES. Released in 1994. **PVP (94)**

Varieties Not Adequately Tested

AC Assiniboia – Late maturity, high yield, medium height, very good lodging

resistance, high test weight and groat percentage. Good resistance to crown rust and smut and tolerance to red leaf. Almost brown seed. Selected by Cereal Research Centre, Agriculture and Agri Food Canada in Winnipeg. Released in 1995.

Ebeltoft – Late maturity, short, very high yield, good lodging resistance, medium test weight and groat percentage. Ivory seed. Modest resistance to crown rust, good resistance to smut, some tolerance to red leaf. Selected at N.D. AES. Released in 1999.

Kildeer – Medium maturity, high yield, short, fair lodging resistance, medium test weight and groat percentage. Ivory seed. Moderately susceptible to crown rust, susceptible to smut and tolerant to red leaf. Selected at N.D. AES. Released in 2001. Because of smut susceptibility, planting only treated seed is recommended. **PVP (pending)**

Moraine – Early maturity, lower yield, medium height, good lodging resistance, high test weight and groat percentage.

Yellow seed. Resistant to crown rust and 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 (pending)**

Youngs – Medium maturity, high yield, tall, good lodging resistance, medium test weight and groat percentage. White seed. Good resistance to crown rust, susceptible to smut and red leaf. Selected at N.D. AES. Released in 1999. Because of smut susceptibility, planting only treated seed is recommended.

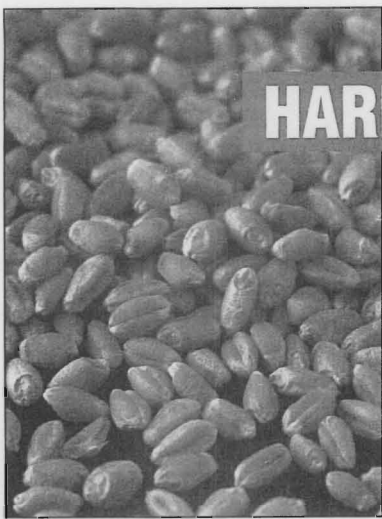
Oat Planting Rate and Date

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

Oat traits, 2000-2001; disease data 2001 only.

Variety	Days After Planting To Heading	Height, Inches	Lodging, 1 = Erect 5 = Flat	Test Weight, Lb/Bu	Groat %	Crown Rust		Smut Score ²	BYDV Score ³
						Amount Infected	Reaction Type ¹		
Moraine	58	40	1.9	39	71	5	MR-MS	R	4.0
Chaps	59	39	2.2	38	68	20	MS-S	S	3.5
Jay	59	35	1.6	38	68	5	S	MS	4.0
Richard	59	43	2.0	39	70	5	MR-MS	MR	4.0
Gem	60	41	2.5	38	69	<1	S	MR	3.5
Wabasha	60	41	2.1	38	71	<1	MS-S	R	4.0
Rodeo	60	40	1.9	37	70	5	MS-s	S	4.5
Kildeer	61	37	2.4	39	71	10	MR-MS	S	4.5
Vista	61	43	3.0	39	71	<1	MS	R	4.5
Milton	61	37	1.6	38	69	<1	MS	MR	7.5
Sesqui	62	40	2.5	39	67	<1	S	R	3.0
Youngs	63	44	2.1	38	70	<1	MS	R	6.0
Jud	64	46	3.3	39	70	5	MS-S	R	4.0
Loyal	64	45	3.3	39	68	<1	MS-S	MR	6.5
Belle	64	40	2.3	39	73	<1	MS	MR	4.5
Paul (hulless)	65	43	2.5	43	93	<1	S	R	6.0
Ebeltoft	65	38	2.5	39	71	<1	MS-S	R	3.0
AC Assiniboia	65	42	1.9	39	74	<1	HR	R	2.0
Mean	62	41	2.3	39	71				

¹ HR = highly resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible. ² R = resistant, MR = moderately resistant, SM = moderately susceptible and S = susceptible. ³ 1 = no symptoms and 9 = dead.



HARD RED SPRING WHEAT

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.

Tested hard red spring wheat varieties are listed in the order of their flowering date in the tables and year of release within variety categories. Only new varieties or those varieties with better than susceptible reaction to scab are being tested.

Variety Selection Criteria

Although all data presented should be considered when choosing wheat varieties, the scab epidemics in the hard red spring wheat growing areas of the state have demonstrated the clear need to give greater weight to selecting varieties for their tolerance to this devastating disease. Scab evaluations include *disease severity*, based on visual spread of the disease on the spike and *grain soundness*, which reflects the variety's ability to maintain plump, sound kernels. These ratings should be considered together to reduce risk of loss. The use of more than one variety to provide different days to

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. These plots are handled so that the factors affecting

Characteristics of hard red spring wheat varieties.

Variety	Days to Heading ¹	Height cm ¹	Straw Strength ²	Test Weight (Lb/Bu)		Protein (%) ³		Baking Quality ⁴
				2001	2-year	2001	2-year	
Forge	52	84	Strong	61.7	61.7	14.4	14.3	Medium
BacUp	53	85	Medium	62.4	62.4	16.9	16.9	High
Ingot	53	90	M. Strong	62.1	62.4	15.0	15.0	Medium-high
Walworth	53	83	Medium	60.2	60.2	14.7	14.8	Medium-high
Ember	54	83	M. Strong	61.6	61.8	13.6	13.7	Low-medium
McKenzie	54	93	Medium	60.1	60.6	14.7	15.0	High-medium
Oxen	54	80	M. Strong	59.5	59.8	14.7	14.8	High-medium
Russ	54	87	M. Strong	59.8	60.1	14.1	14.2	High-medium
2375	55	82	Medium	61.4	61.1	14.6	14.4	Medium
Alsen	55	81	Strong	61.3	61.7	15.2	15.2	High
Hanna	55	92	M. Strong	60.6	—	14.9	—	—
Keystone	55	87	M. Strong	61.3	—	13.9	—	—
Norm	55	80	Strong	59.7	60.1	14.1	14.0	Medium-high
Parshall	55	90	Strong	62.2	62.3	14.9	15.1	High-medium
Reeder	55	85	Strong	60.2	60.6	14.8	14.9	Medium-high
CDC Bounty	56	95	Medium	61.4	—	15.4	—	—
Dandy	56	78	V. Strong	60.7	60.7	13.9	14.4	Low
Gunner	56	88	M. Strong	61.5	60.8	15.6	15.6	High-medium
HJ98	56	79	Medium	58.7	59.1	14.3	14.2	Medium-low
Knudson	56	78	M. Strong	60.8	—	14.5	—	—
Mercury	56	73	Strong	60.3	60.4	14.2	14.3	Medium
NorPro	56	78	Strong	59.8	59.7	14.4	14.4	Medium-low
Amazon	57	95	Medium	59.7	—	14.7	—	—
Aurosa	57	69	V. Strong	59.3	59.0	14.0	13.8	Medium-low
Ivan	57	76	V. Strong	59.7	59.8	13.8	13.8	Low
Marshall	57	76	Strong	60.1	59.8	14.0	13.9	Low
Verde	57	82	M. Strong	59.7	60.1	14.5	14.3	Low-medium
McVey	58	85	Medium	58.1	58.2	13.3	13.3	Low
Mean	55	83		60.7	60.5	14.6	14.7	
LSD	1	4		1.0	0.8	0.5	0.3	

¹ 2001 data. ² 1999-2001 data. ³ 12% moisture basis. ⁴ 1999-2000 data.

Grain yield (percent of the mean) of hard red spring wheat varieties in Minnesota, northern locations.

Variety	Crookston			Roseau		Stephen		
	2001	2-year	3-year	2001	2-year	2001	2-year	3-year
Forge	91	98	100	107	88	99	98	93
BacUp	77	71	76	72	70	85	67	73
Ingot	99	98	98	109	95	100	99	97
Walworth	109	103	—	107	97	116	106	—
Ember	93	101	96	105	92	103	106	100
McKenzie	92	92	—	95	87	103	99	—
Oxen	104	103	104	106	105	106	107	109
Russ	100	95	96	89	102	107	113	108
2375	106	101	103	101	104	116	106	110
Alsen	95	90	—	106	101	111	103	—
Hanna	93	—	—	92	—	118	—	—
Keystone	94	—	—	97	—	110	—	—
Norm	108	104	103	98	98	91	93	96
Parshall	98	98	100	112	103	104	103	96
Reeder	114	107	103	116	110	109	103	97
CDC Bounty	73	—	—	92	—	103	—	—
Dandy	112	108	—	109	112	104	100	—
Gunner	93	85	80	97	91	92	100	95
HJ98	93	93	97	85	99	94	111	110
Knudson	103	—	—	111	—	98	—	—
Mercury	116	113	111	120	116	97	102	104
NorPro	100	103	103	100	104	86	99	101
Amazon	83	—	—	91	—	104	—	—
Aurora	108	102	102	105	99	99	104	105
Ivan	108	106	110	110	113	100	97	105
Marshall	85	91	93	100	103	94	98	90
Verde	108	104	103	84	93	101	100	104
McVey	95	97	98	94	99	101	112	113
LSD	13	13	12	15	22	18	22	1
Mean, Bu/Acre	69.2	70.1	62.3	52.9	57.1	32.5	40	42.3

heading and use of different seeding dates is highly recommended to reduce risk. Variety descriptions do not provide information on scab resistance. Table information should be used.

General Purpose Varieties

Aurora – Awned, late maturity, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. High to medium yield and low to medium test weight. Very strong straw. Low to medium protein percent. Released by NorthStar Genetics in 1999.

Ember – Awned, early-midseason maturity, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Moderately susceptible to other leaf diseases. Medium yield and high test weight. Moderately strong straw. Low to medium protein percent. Released by S.D. AES in 1999. **PVP (pending)**

McVey – Awned, late maturity, medium height. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. High to medium yield and low test weight. Medium straw strength. Low protein percent. Released by Minn. AES and USDA-ARS in 1999. **PVP (pending)**

NorPro – Awned, midseason-late, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. Very high yield and medium test weight. Strong straw. Medium protein percent. Released by AgriPro in 1999. **PVP (94)**

Parshall – Awned, midseason maturity, tall. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. Medium to high yield and very high test weight. Strong straw. High protein percent. Released by N.D. AES in 1999. **PVP (94)**

Reeder – Awned, midseason maturity, medium height. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. Very high yield and medium to high test weight. Strong straw. Medium to high protein percent. Released by N.D. AES in 1999. **PVP (94)**

HJ98 – Awned, midseason-late maturity, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately susceptible to other leaf diseases. High to medium yield and medium test weight. Medium straw strength. Medium to low protein percent. Released by Minn. AES and USDA-ARS in 1998. **PVP (94)**

Ingot – Awned, early, tall. Resistant to stem rust and moderately susceptible to leaf rust. Moderately susceptible to other leaf diseases. High to medium yield and very high test weight. Moderately strong straw. Medium to high protein percent. Released by the S.D. AES in 1998. **PVP (pending)**

Ivan – Awned, late maturity, semidwarf. Resistant to stem rust and to leaf rust. Moderately resistant to other leaf diseases. Very high yield and medium test weight. Very strong straw. Low to medium protein percent. Released by AgriPro in 1998. **PVP (94)**

Forge – Awned, very early, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Moderately susceptible to other leaf diseases. High to medium yield and high test weight. Strong straw. Medium to low protein percent. Released by S.D. AES in 1997. **PVP (94)**

Mercury – Awned, midseason-late maturity, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. Very high yield and medium test weight. Strong straw. Medium to low protein percent. Released by NorthStar Genetics in 1997.

Gunner – Awned, midseason-late maturity, tall. Resistant to stem rust and moderately susceptible to leaf rust. Moderately resistant to other leaf diseases. Low yield and high to medium test weight.

Moderately strong straw. High protein percent. Released by AgriPro in 1996.

FVF (94)

Oxen – Awned, early-midseason, semi-dwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately susceptible to other leaf diseases. Very high yield and medium test weight. Moderately strong straw. Medium protein percent. Released by S.D. AES in 1996. **FVF (94)**

Russ – Awned, early-midseason maturity, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Moderately susceptible to other leaf diseases. High yield and medium test weight. Moderately strong straw. Medium to low protein percent. Released by S.D. AES in 1995. **FVF (94)**

Verde – Awned, late maturity, semi-dwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. High to medium yield and medium test weight. Moderately strong straw. Medium to low protein percent. Released by Minn. AES and USDA-ARS in 1995. **FVF (94)**

Norm – Awned, midseason, semidwarf. Resistant to stem rust and to leaf rust. Moderately resistant to other leaf diseases. High to medium yield and medium test weight. Strong straw. Low to medium protein percent. Included in trials as a scab-susceptible check. Released by Minn. AES and USDA-ARS in 1992. **FVF**

2375 – Awned, midseason maturity, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Susceptible to other leaf diseases. High to medium yield and high test weight. Medium straw strength. Tolerant to loose smut. Moderately susceptible to shattering. Medium to low protein percent. Released by Pioneer Hi-Bred in 1988. Sold by N.D. State University Research Foundation 1990. **FVF (94)**

Marshall – Awned, late maturity, semi-dwarf. Resistant to stem rust and moderately susceptible to leaf rust. Moderately susceptible to other leaf diseases. Medium yield and test weight. Strong straw. Low to medium protein percent. Re-

Grain yield (percent of the mean) of hard red spring wheat varieties in Minnesota.

Variety	State			North			South			On-Farm		
	2001	2 yr	3 yr	2001	2 yr	3 yr	2001	2 yr	3 yr	2001	2 yr	3 yr
Forge	99	96	95	98	94	95	99	97	95	101	98	99
BacUp	72	69	70	77	70	73	70	68	68	–	–	–
Ingot	98	97	97	103	97	97	95	96	97	99	99	101
Walworth	108	108	–	110	102	–	107	112	–	–	–	–
Ember	95	95	92	100	99	96	92	91	90	108	104	99
McKenzie	91	91	–	95	92	–	88	91	–	89	89	–
Oxen	109	108	109	105	104	106	112	112	111	109	105	111
Russ	104	105	106	98	102	101	108	108	109	99	98	105
2375	105	101	101	06	103	105	103	100	98	102	100	102
Alsen	98	99	–	102	97	–	95	101	–	96	94	–
Hanna	93	–	–	98	–	–	90	–	–	–	–	–
Keystone	98	–	–	98	–	–	98	–	–	–	–	–
Norm	104	100	101	101	99	100	106	102	103	–	–	–
Parshall	96	96	96	104	101	99	92	93	94	96	94	97
Reeder	110	107	106	114	107	103	108	107	108	105	104	106
CDC Bounty	80	–	–	86	–	–	76	–	–	–	–	–
Dandy	106	105	–	109	108	–	103	104	–	106	104	–
Gunner	94	86	87	94	90	87	93	84	86	93	91	86
HJ98	102	102	103	91	99	101	109	105	104	95	103	102
Knudson	106	–	–	105	–	–	106	–	–	–	–	–
Mercury	113	111	113	114	111	110	113	111	114	108	108	–
NorPro	110	107	107	97	102	102	118	111	110	105	107	–
Amazon	95	–	–	91	–	–	–	–	–	–	–	–
Aurora	102	101	102	105	102	102	100	100	102	–	–	–
Ivan	107	105	110	107	106	109	107	105	110	101	106	112
Marshall	99	96	93	92	97	95	104	96	92	96	99	97
Verde	100	102	104	98	99	101	101	104	106	96	100	102
McVey	106	102	103	96	101	102	112	103	103	100	106	106
LSD	11	7	6	15	10	9	14	10	8	–	–	–
Mean, Bu/Acre	57	58	55.2	51.5	55.7	53.5	61.2	59.6	56.4	59.8	65.9	59.9

leased by Minn. AES and USDA-ARS in 1982. **FVF**

Special Purpose Varieties

BacUp – Awned, early, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Susceptible to other leaf diseases. Low yield and very high test weight. Medium straw strength. Very high protein percent. Specialty variety release for scab tolerance with recommendation that it not be used on over 15 to 20% of acreage. Released by Minn. AES and USDA-ARS in 1996.

Varieties Not Adequately Tested

Hanna – Awned, midseason maturity, tall. Resistant to stem rust and moderately resistant to leaf rust. Medium yield and test weight. Moderately strong straw. Medium protein percent. Released by AgriPro in 2001. **FVF (pending)**

Keystone – Awned, midseason maturity, medium height. Resistant to stem rust and moderately resistant to leaf rust. Medium yield and medium to high test weight. Moderately strong straw. Low protein percent. Released by Western Plant Breeders in 2001. **FVF (pending)**

Knudson – Awned, midseason-late maturity, semidwarf. Resistant to stem rust and to leaf rust. High yield and medium test weight. Moderately strong straw. Medium protein percent. Released by AgriPro in 2001. **FVF (pending)**

Walworth – Awned, early maturity, medium height. Resistant to stem rust and moderately resistant to leaf rust. Moderately susceptible to other leaf diseases. Very high yield and medium test weight. Medium straw strength. Medium protein percent. Released by S.D. AES in 2001. **FVF (pending)**

Alsen – Awned, midseason maturity, semidwarf. Resistant to stem rust and leaf rust. Moderately resistant to other leaf diseases. High to medium yield and high test weight. Strong straw. High protein percent. Released by N.D. AES in 2000. **PVP (94)**

Dandy – Awned, midseason-late maturity, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. Very high yield and high to medium test weight. Very strong straw. Medium to low protein percent. Released by North-Star Genetics in 1999. **PVP (94)**

Amazon – Awned, late maturity, tall. Resistant to stem rust. Medium to low test weight. Medium straw strength. Medium protein percent. Developed by the University of Manitoba, marketed by Canterra Seeds Ltd.

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 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:

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

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	113

Grain yield (percent of the mean) of hard red spring wheat varieties in Minnesota, southern locations.

Line	Lamberton			Morris			St. Paul			Waseca		
	2001	2-year	3-year	2001	2-year	3-year	2001	2-year	3-year	2001	2-year	3-year
Forge	106	102	99	79	86	88	102	98	91	109	109	103
BacUp	70	71	69	62	64	68	74	66	64	72	75	70
Ingot	108	106	103	96	101	101	79	78	82	95	99	99
Walworth	103	113	–	111	109	–	110	110	–	106	121	–
Ember	86	84	84	92	91	82	95	96	96	97	98	99
McKenzie	82	88	–	105	100	–	79	80	–	87	94	–
Oxen	112	114	113	106	105	108	118	117	116	111	112	109
Russ	106	107	110	120	115	110	102	101	104	108	105	111
2375	100	96	95	105	103	100	107	99	98	102	101	97
Alsen	106	112	–	75	91	–	101	99	–	97	105	–
Hanna	88	–	–	93	–	–	84	–	–	96	–	–
Keystone	109	–	–	96	–	–	92	–	–	94	–	–
Norm	116	105	106	101	101	102	104	100	101	104	99	102
Parshall	99	98	98	99	96	98	82	86	87	88	90	92
Reeder	111	112	113	116	107	109	104	106	107	102	100	102
CDC Bounty	67	–	–	85	–	–	71	–	–	83	–	–
Dandy	110	110	–	100	105	–	104	103	–	97	96	–
Gunner	106	90	91	88	89	90	81	75	79	96	78	84
HJ98	108	103	101	106	107	107	109	106	105	113	101	104
Knudson	108	–	–	94	–	–	119	–	–	103	–	–
Mercury	119	105	107	99	104	109	128	125	124	105	115	118
NorPro	115	119	118	122	108	106	129	116	114	108	99	102
Amazon	–	–	–	108	–	–	–	–	–	–	–	–
Aurora	95	89	96	106	109	108	100	105	106	100	93	98
Ivan	105	109	114	116	101	108	106	108	111	105	100	108
Marshall	101	93	92	102	94	90	106	107	104	106	87	82
verde	90	95	101	116	107	105	101	107	110	100	105	109
McVey	83	82	86	136	121	118	116	98	100	116	110	107
LSD	16	18	14	18	18	14	24	17	16	14	25	18
Mean, Bu/A	65.8	62.8	57.2	56.1	72.7	67.7	62.2	57.3	50.1	60.4	45.7	50.4

CDC Bounty – Awnless, midseason-late maturity, tall. Resistant to stem rust. Low yield and medium to high test weight. Medium straw strength. High protein percent. Developed by Crop Development Centre, University of Saskatchewan, marketed by Canterra Seeds Ltd.

McKenzie – Awned, early-midseason maturity, tall. Resistant to stem rust and leaf rust. Medium yield and medium to high test weight. Moderately resistant to other leaf diseases. Medium straw strength. Medium to high protein percent. Developed by AgPro/Saskatchewan Wheat Pool in 1997. Marketed by Croplan Genetics.

WINTER WHEAT

Winter wheat varieties are compared in trial plots at Morris, Rosemount, and Roseau. 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 only be used to compare varieties within a table.

Variety Selection Criteria

Varieties are listed in order of heading. The varieties tested differ in their winterhardiness and this characteristic should receive attention when choosing varieties. Cultural practices have a major effect on winter survival of all winter wheat varieties. Planting into a firm seedbed with at least some stubble remaining to retain snow cover can reduce winterkill.

Varieties

Culver – Awned, early maturity, medium height. Moderate winterhardiness. Moderately strong straw. Resistant to stem

Disease reactions of hard red spring wheat varieties.

Variety	Leaf Rust ¹	Stem Rust ¹	Other Leaf Diseases ¹	Scab	
				Disease Severity ¹	Grain Soundness ²
Forge	MS	R	MS	MR-MS	2.5
BacUp	MS	R	S	MR	1.5
Ingot	MS	R	MS	MR-MS	2.0
Walworth	MR	R	MS	MR-MS	2.5
Ember	MS	R	MS	MR	2.5
McKenzie	R	R	MR	MR-MS	2.5
Oxen	MR-MS	R	MS	MS-S	3.0
Russ	MS	R	MS	MR-MS	3.0
2375	MS	R	S	MR-MS	2.5
Alsen	R	R	MR-R	MR	1.5
Hanna	MR-MS	R	–	–	–
Keystone	MR-MS	R	–	–	–
Norm	R	R	MR-R	S	5.0
Parshall	MR-MS	R	MR-R	MR-MS	2.0
Reeder	MR-MS	R	MR-R	MS	3.5
CDC Bounty	–	R	–	–	–
Dandy	MR-MS	R	MR	MS	3.0
Gunner	MS	R	MR	MR-MS	2.5
HJ98	MR-MS	R	MS	MS	3.0
Knudson	R	R	–	–	–
Mercury	MR	R	MR	S	5.0
NorPro	MR	R	MR-R	MS	3.5
Amazon	–	R	–	–	–
Aurora	MR-MS	R	MR	S	5.0
Ivan	R	R	MR-R	MS-S	4.0
Marshall	MS	R	MS	MS	3.5
Verde	MR-MS	R	MR-R	MS	3.5
McVey	MR-MS	R	MR	MR-MS	2.5

¹ R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible.

² Ability to maintain plump, sound kernels under scab epidemics: 1=good, 5=poor.

rust. Medium test weight and protein. Released by Neb. AES and USDA-ARS in 1998. **PVP (94)**

Ransom – Awned, medium-late maturity, medium height. Moderately high winterhardiness. Medium straw strength. Moderately resistant to stem rust and to leaf rust. Medium-low test weight and protein. Released by N.D. AES in 1998. **PVP (pending)**

Crimson – Awned, red-chaffed, medium maturity, medium height. Moderate winterhardiness. Moderately strong straw. Moderately resistant to stem rust and susceptible to leaf rust. Moderate resistance to Septoria tritici blotch. High test weight and protein. Released by S.D. AES in 1997. **PVP (94)**

Harding – Awned, medium maturity, medium height. Moderate winterhardiness. Medium straw strength. Moderate-

ly resistant to stem rust. Medium test weight and high protein. Released by S.D. AES in 1997. **PVP (pending)**

Tandem – Awned, early maturity, medium height. Moderate winterhardiness. Medium straw strength. Moderately resistant to stem rust and susceptible to leaf rust. High test weight and protein. Released by S.D. AES in 1997. **PVP (94)**

Windstar – Awned, early-medium maturity, semidwarf. Moderate winterhardiness. Strong straw. Moderately resistant to stem rust to leaf rust. Medium test weight and protein. Released by Neb. AES and USDA-ARS in 1996. **PVP (94)**

Elkhorn – Awned, medium-late maturity, tall. High winterhardiness. Medium straw strength. Resistant to stem rust and moderately susceptible to leaf rust. Medium test weight and protein. Released by the N.D. AES in 1995. **PVP**

Arapahoe – Awned, early maturity, medium height. Moderate winterhardiness. Moderately strong straw. Resistant to stem rust and moderately resistant to leaf rust. Medium test weight and protein. Released by Neb. AES and USDA-ARS in 1988. **PVP**

Seward – Awned, medium-late maturity, tall. Moderately high winterhardiness. Medium straw strength. Moderately re-

sistant to stem rust and susceptible to leaf rust. Medium test weight and low protein. Released by N.D. AES in 1987.

Roughrider – Awned, medium-late maturity, tall. Very high winterhardiness. Medium straw strength. Resistant to stem rust and susceptible to leaf rust. Medium test weight and high protein. Released by N.D. AES in 1975.

VARIETIES NOT ADEQUATELY TESTED.

Wahoo – Awned, early, semidwarf. Moderate winterhardiness. Medium-low test weight and protein. Released by Neb. AES in 2001. **PVP** (pending)

Millennium – Awned, early-medium maturity, medium height. Moderate winterhardiness. Strong straw. High test weight and medium protein. Released by Neb. AES and USDA-ARS in 1999. **PVP** (pending)

Nuplains – Awned, medium maturity, short-semidwarf. Moderate winterhardiness. Strong straw. High test weight and low-medium protein. White grain color. Released by USDA-ARS and the Nebraska, South Dakota, and Wyoming Agricultural Experiment Stations in 1999. **PVP** (pending)

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

Variety	Morris		Roseau		St. Paul		State	
	2000	2001	3-year	2001	3-year	2001	3-year	
Nahoo	–	106	–	114	–	110	–	
Culver	99	112	103	118	121	115	110	
Arapahoe	107	101	109	113	108	106	108	
Tandem	102	110	109	79	96	96	102	
Windstar	111	105	105	128	123	116	114	
Millennium	112	120	–	105	–	113	–	
Crimson	93	107	102	97	97	103	99	
Harding	112	97	102	98	102	97	104	
Nuplains	104	96	–	114	–	104	–	
Roughrider	94	91	94	72	80	82	88	
Elkhorn	90	83	92	86	89	84	91	
Ransom	107	99	102	94	110	97	106	
Seward	94	94	104	96	102	95	101	
LSD	16	18	18	21	14	20	11	
Mean, Bu/Acre	59.4	81.9	58.7	65	59.8	73.5	59.2	

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

Growth characteristics of winter wheat varieties.

Variety	Heading, Days From Jan 1	Height, Inches	Winter-Hardiness ¹	Lodging Rating	Test Weight, Pounds/Bushel		Protein % ²		Rust Resistance ³	
					2001	3-year	2001	3-year	Leaf	Stem
Wahoo	156	39	M	–	59.0	–	11.6	–	–	–
Culver	156	40	M	M. Strong	59.4	59.0	13.0	13.1	–	R
Arapahoe	156	41	M	M. Strong	59.9	59.3	12.4	13.1	MR	R
Tandem	156	42	M	Medium	60.9	60.5	13.9	13.6	S	MR
Windstar	157	39	M	Strong	59.8	59.1	13.1	12.9	MR-MS	MR
Millennium	157	41	M	Strong	61.1	–	12.8	–	–	–
Crimson	158	43	M	M. Strong	61.8	61.1	13.3	13.3	S	MR
Harding	158	43	M	Medium	60.7	59.6	13.0	13.6	–	MR
Nuplains ⁴	158	38	M	Strong	61.3	–	11.7	–	–	–
Roughrider	159	46	VH	Medium	60.0	59.8	13.1	13.2	S	R
Elkhorn	160	47	H	Medium	60.4	59.9	12.3	13.2	MS	R
Ransom	160	43	MH	Medium	59.2	59.2	11.2	12.9	MR	MR
Seward	160	45	MH	Medium	60.2	59.6	11.3	12.1	S	MR
Mean	158	43			60.3	59.7	12.6	13.1		
LSD	2				2.1	1.1	1.7	0.6		

¹ Winterhardiness rating is a relative ranking that includes data from North Dakota, Nebraska and South Dakota (VH=very high, H=high, MH=moderately high, M=moderate. ² 12% moisture basis. ³ R=resistant, MR=moderately resistant, MS=moderately susceptible, S=susceptible. ⁴ White seeded.



WILDRICE

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

Varieties

Franklin – Medium height, medium to early maturity. More resistant to shattering than K2, Petrowske Bottlebrush or

Voyager, especially retaining more seed when harvest is delayed. Released 1992 by Minn. AES.

K2 – Medium height, early to medium maturity and medium to high yield. Developed by Kosbau Brothers in 1972.

Petrowske Bottlebrush – Medium height, medium to late maturity and high yield. Up to 50 percent of plants can have bottlebrush panicle type, depending on continued selection for that trait. Developed by K & D Wild Rice.

Petrowske Purple – Moderately high fungal brown spot disease resistance and

yield. High shattering resistance and lodging resistance. Consists of heterogeneous panicle types, most of which have some degree of purple at full flowering. Medium plant height. Medium-late maturity, flowering several days to a week after K2 and Petrowske Bottlebrush. Released 2000 by Minn. AES under a licensing agreement.

Voyager – Short to medium height, early maturity and high yield. Should mature a few days earlier than K2. Developed by Minn. AES, released in 1983.

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

Because of likelihood of preharvest losses due to high winds, storms, blackbird damage and killing frost before varietal

Wildrice Planting Rate and Date

Bushel Weight, Pounds	25
Seeds/Pound.....	7,900
Planting Rate, Pounds/Acre	33
Planting Rate, Seeds Sq. Ft.	6
Planting Date	Late Fall

Yield, shattering, lodging and fungal brown spot (FBS) ratings for wildrice varieties.

Variety	Waskish				Clearbrook			Atkin			98-01 Average			
	Yield, Lb/Acre	Shattering %	Lodging Score	FBS Score	Yield, Lb/Acre	Lodging Score	FBS Score	Yield, Lb/Acre	Lodging Score	FBS Score	Yield, Lb/Acre ¹	Shattering % ²	Lodging Score ³	FBS Score ⁴
Franklin	1,160	23	2.6	5.2	1,870	3.5	3.9	884	2.1	4.5	1,182	23	2.5	4.7
K2	1,261	20	1.8	4.7	1,801	3.0	4.5	846	1.8	4.4	1,219	20	2.0	4.6
Petrowske Bottlebrush	1,093	24	2.4	5.6	2,015	3.5	5.6	569	2.5	6.5	1,075	24	2.6	5.9
Petrowske Purple	1,327	22	1.6	3.9	1,974	2.5	3.5	819	1.4	3.9	1,274	22	1.6	3.8
Voyager	970	25	2.5	5.8	1,248	3.5	4.6	547	2.0	5.6	889	25	2.5	5.4
LSD 5%	202	4	0.4	0.7	613	0.9	0.9	235	0.4	0.8	158	4	0.3	0.5
Years	98-99-00-01	98-99-01	98-99-01	98-99-00-01	98-99-00-01	98-99-00-01	98-99-00-01	00-01-01	00-01-01	00-01-01	00-01-01	00-01-01	00-01-01	00-01-01

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 Fungal Brown Spot rating using a 1-9 scale where 1=no significant disease lesions and 9=completely susceptible (dead).

Minnesota Approved Seed Conditioners and Marketing Association

Member plants of this association are identified by the symbol at the right. In addition to being approved for conditioning certified seed by the Minnesota Crop Improvement Association (MCI) they voluntarily maintain membership in MASCMA to promote professionalism in seed conditioning and distribution.



These plants play a significant role in distributing seed of varieties developed by the Agricultural Experiment Station and

in enhancing the quality of seed planted in Minnesota. They are designed specifically for the proper conditioning of seed, are properly built and equipped, meet specific seed-handling standards, and are inspected at least annually by MCI to assure that all requirements for approved plant status are met.

Seed conditioning plants identified by the symbol of the Minnesota Approved Seed Conditioners and Marketing Association and listed below are a wise choice for quality seed conditioning services.

Adams Seed	Wendell	218-458-2151	Knapp Seed Farm	Foxhome	218-739-3366
Albert Lea Seed House	Albert Lea	507-373-3161	L.B. Grain	Lake Bronson	218-754-4200
Angell Seed Farm	Blooming Prairie	507-583-7581	Lee Seed Farm	Borup	218-494-3330
Backman Seeds	Herman	320-677-2231	Lee's Seed Farm	Benson	320-843-2857
Behm Seed Company	Atwater	320-974-3003	Lincoln County Feed & Seed	Ivanhoe	507-694-1243
Beyer Seed Farm	Kent	218-643-5126	Marvin's	Warroad	218-386-1333
Bloomquist Farms	Drayton, N.D.	218-455-3863	McIntyre Farms	Cassleton, N.D.	701-347-5355
Borg Seed Farms	Cokato	320-286-2222	Meyer's Seed	Elgin	507-876-2482
Buer's Seeds	Canby	507-223-5100	Mid-Valley Grain Cooperative	Crookston	218-281-2881
Bursch Seed Company	Mahnomen	218-935-2772	Nietfeld Farm	Melrose	320-987-3442
Capistran Seed Company	Crookston	218-281-7840	Petermann Seeds	Hawley	218-483-3302
Circle C Seeds	Gary	218-356-8214	Red River Marketing Company	Elbow Lake	218-685-6100
Clearwater Valley Seeds	Gully	218-268-4171	Rivard's Quality Seeds	Argyle	218-437-6638
Clinton Ag Service	Clinton	320-325-5203	Ron Petersen Seeds	Lake Bronson	218-754-4631
Corning Seed & Supply	Austin	507-433-9002	Ross Seed Company	Fisher	218-891-2211
Crop Production Services	Perham	218-346-2355	Rosbach Lakeside Seeds	Hanska	507-794-7698
Dahlco Seeds	Cokato	320-286-5982	Sawvell's Seed	Clements	507-692-2240
Dammann Seed Farms	Plato	320-864-3004	Spronk & Sons Seed Farm	Edgerton	507-442-5334
Enestvedt Brothers	Sacred Heart	320-765-2728	State Line Farmers Cooperative	Madison	320-598-7351
Falk Seed Farm	Murdock	320-875-4341	Storden Seed & Chemical Service	Storden	507-445-3217
Farmers Cooperative Assn.	Jackson	507-847-4160	Swenson Seed Farm	Brooks	218-796-5285
Farmers Co-op Grain & Seed	Thief River Falls	218-681-6281	Thiel Seed Service	Wendell	218-458-2415
Galler Seeds	Elysian	507-267-4328	Tobolt Seed	Moorhead	218-287-2904
Haberer Seed Farm	Morris	320-795-2468	Watowan Farm Service	Kiester	507-294-3697
Habstritt Farms	Roseau	218-463-1193	Weinlader Seed Company	Drayton, N.D.	701-454-6427
Haugrud Seed Plant	Rothsay	218-493-4275	Werner Farm Seeds	Dundas	507-645-7995
Heartland Seeds	Moorhead	218-585-4621	Wigen Seed Farm	Litchfield	320-693-8182
Hermanson Seed Plant	Boyd	320-855-2582	Zabel Seeds	Plainview	507-534-2487
Jensen Seed Company	Stephen	218-478-3397	Ziller Seed Company	Bird Island	320-365-3674
JSE, Inc. (Johnson Seed Farm)	Sacred Heart	320-765-2225	Zimmerman Seeds	Racine	507-378-2077

OILSEED CROPS



CANOLA

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.

The oil in canola seed contains less than 2 percent erucic acid, compared with 20 to 40 percent found in oilseed rape. The canola meal remaining after oil extraction contains less than 0.1 percent glucosinolates (sulfur-containing compounds) compared with about 1 percent in rapeseed meal.

Canola Planting Rate and Date

Bushel Weight (Pounds).....50
 Seeds/Pound.....80,000 to 160,000
 Planting Rate, Pounds/Acre.....3 to 7
 Planting Rate, Seeds/Square Foot..6 to 9
 Planting Date.....Early Spring

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.

The canola varieties described here are all spring-sown *Brassica napus*

types. Fall-planted winter-type canola varieties were

evaluated by University of Minnesota researchers over 10 years ago with limited success. However, newer winter-type canola varieties, planted in the fall of 2001, are being evaluated at Thief River Falls for 2002 harvest.

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) or fax (651-638-0756).

A complete Canola Growers Manual on canola production is available from the Canola Council of Canada, 400-167 Lombard Ave, Winnipeg, Manitoba, Canada R3B 0T6

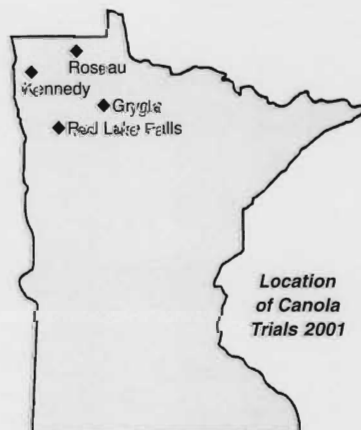
(phone 204-982-2100, internet www.canola-council.org). It contains detailed information on canola production practices and costs \$68.00 (U.S.). The Canola Grower's Manual is also available for viewing online at www.canola-council.org. Please keep in mind when using this manual that not all pesticides used in Canada are legal in the United States. Always confirm the clearance of a pesticide with your local dealer or county extension educator. Another management tool is a CD-ROM called the “Canola Growers Decision Support System” available from the Canola Council of Canada for \$250.00 (U.S.).

Test Sites

Non-Roundup Ready and Roundup Ready variety trials were conducted at four sites in 2001. The Red Lake Falls testing site (formerly called the Crookston site) was on the Monte Casavan farm, the Roseau site was on the Braaten Farms, the Grygla site was on the Todd Stanley farm, and a Kennedy test site was on the Rob and Tim Rynning farm. Because of Raptor drift at the Grygla site, the non-Roundup Ready variety trial was compromised and the results are not

Canola Variety Name Changes

Old Name or Experimental Number	New Variety Name
B2674 RR	SW Badge RR
HysSyr 5034 RR	Gladiator
LG 3455	DKL3455
SR-1871	Thunder
SR96279	LiBred-279
SW C5033	RufeRR



reported. High winds after swathing resulted in damage to numerous plots at Red Lake Falls, Grygla and Kennedy, resulting in some data being unreliable and thus discarded from those sites.

Local Support

Cenex-Harvest States of Kennedy provided sponsorship for the Kennedy site. Farmer's Union Oil of Grygla provided support for the Grygla site.

Field Day Assistance

County extension educators Nathan L. Johnson, Hans J. Kandel, Curtis W. Nyegaard, Bill Craig and Howard A. Person provided field day assistance.

Canola seed sources for 2001 planting, keyed to Variety Information column, seed yield tables, pages 54-62.

Developers

- D1 Advanta Seeds, Dijkwelsestraat 70, Kapelle, Netherlands
D2 Agriprogress, P.O. Box 2499, Morden, MB, Canada R6M 1C2
D3 Aventis Crop Science, 203-407 Downey Rd., Saskatoon, SK, Canada S7N 4L8
D4 DSV/Brett-Young Seeds, Box 99 St. Norbert P.O., Winnipeg, MB, R3V 1L5
-
- D5 InterMountain Canola Cargill, 2300 N. Yellowstone Hwy., Suite 122, Idaho Falls, ID 83401
D6 Limagrain Canada Seeds Inc. #4-411 Downey Rd, Saskatoon, SK, Canada S7N 4L8
D7 Pioneer Hi-Bred International, Inc., 7200 N.W. 62nd Ave., Johnston, IA 50131
-

- D8 Svalof Weibull Ltd., 2-411 Downey Road, Saskatoon, SK, Canada S7N 4L8
D9 SWP, ARD, Saskatoon, SK, Canada S7N 4L8
D10 University of Alberta/Agricore, P.O. Box 2700, Station "M", Calgary, AB, Canada T2P 2P5
D11 Not available
-

Marketers

- M1 Agri-tel Inc, 4111 30th Ave. S., Moorhead, MN 56560, 218-287-5510
M2 Aventis Crop Science, 203-407 Downey Rd., Saskatoon, SK, Canada S7N 4L8, 701-775-2700
M3 Canterra Seeds Ltd., 14-62 Scurfield Blvd, Winnipeg, MB, R3Y 1M5, 204-988-9751
M4 Croplan Genetics, P.O. Box 1291, Minot, ND 59702, 701-852-3556
M5 Integra Seed Ltd., P.O. Box 40, Bozeman, MT 59771, 406-582-8375
-
- M6 InterMountain Canola Cargill, 2300 N. Yellowstone Hwy., Suite 122, Idaho Falls, ID 83401, 208-522-4113
M7 Interstate Seed Company, 1215 Parkway, West Fargo, ND 58078, 800-437-4120
M8 LaCrosse Seeds, 2541 Commerce St., P.O. Box 995, LaCrosse, WI 54602, 800-328-1909
M9 Limagrain Canada Seeds Inc., #4-411 Downey Road, Saskatoon, SK, Canada S7N 4L8, 306-249-4220
M10 Monsanto, 3100 Sycamore Rd., De Kalb, IL 60115, 815-758-9323
-
- M11 Pioneer Hi-Bred International, Inc., 7200 N.W. 62nd Ave., Johnston, IA 50131, 701-298-6894
M12 Proseed, 705 E., Brewster, Harvey, ND 58341, 701-324-4177
M13 Seeds 2000, Box 200, Breckenridge, MN 56520, 218-643-2410
M14 Van Seeds, Box 295, Bottineau, ND 58318, 888-325-7162
M15 Not Available
-

Seed yield of Non-Roundup Ready canola varieties (lb/acre at 8% moisture) at Roseau, Kennedy and Red Lake Falls for 2001.

Variety information includes Source Codes: (D# = Developer; M# = Marketer) keyed to listing, page 53, and these supplemental codes: H = Hybrid,

SP = Specialty oil, Op = Open Pollinated, Syn = Synthetic, LL = Liberty Link, C = Clearfield (Raptor tolerant).

*Average yields were analyzed using three replicates from each site.

**Note - Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

***YNA = Yield not available due to wind damage after swathing.

Blackleg resistance rating provided by seed companies: R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible,

NA = Not Available.

Variety	Variety Information	Blackleg Resistance	Average*			Average,* All 3 Sites	
			Roseau	Red Lake Falls	Roseau, Red Lake Falls Kennedy		
46A76	D7,M11,Op	R	1,352	1,792	1,558	1,212	1,442
Canterra 1492	D2,M12,H	MR	1,442	1,817	1,500	1,269	1,423
CL 2070	D2,M4,H	MR	1,362	1,482	1,456	1,114	1,342
Cracker Jack	D8,M5,Syn	MR	1,143	1,267	1,238	831	1,102
Ebony	D6,M1,Op	MR	1,410	1,719	1,605	1,275	1,495
Hudson	D2,M4,Op	MR	1,387	1,453	1,396	YNA ***	—
HyClass 601	D4,M4,H	MR	1,449	1,587	1,585	1,245	1,472
Hylite 243	D1,M7,Op,C	MR	927	1,687	1,203	776	1,061
Hyola 330	D1,M7,H	MS	1,584	2,007	1,732	YNA	—
Hyola 401	D1,M7,H	S	1,958	2,015	1,881	YNA	—
IMC 205	D5,M6,Op,Sp	MS	1,472	1,738	1,607	YNA	—
IMC 207	D5,M6,Op,Sp	MR	1,403	1,780	1,581	1,155	1,439
IMC 302	D5,M6,Op,Sp	MS	1,368	1,687	1,549	923	1,340
InVigor 2573	D3,M2,H,LL	R	1,701	1,848	1,723	1,688	1,711
InVigor 2643	D3,M2,H,LL	R	1,614	1,668	1,613	1,231	1,486
InVigor 2663	D3,M2,H,LL	R	1,655	1,982	1,827	YNA	—
KAB 36	D2,M4,Op,C	MR	1,365	1,925	1,638	1,178	1,484
LG 3366	D6,M1,Op	R	1,362	1,773	1,559	1,206	1,441
LiBred-279	D4,M14,Op	MR	1,385	1,608	1,468	1,120	1,352
Minot **	D2,M4,Op	MR	1,306	1,763	1,529	950	1,336
N000-0079	D9,M15,Exp.	NA	1,300	1,596	1,457	1,430	1,448
N000-0346	D9,M15,Exp.	NA	1,430	1,786	1,596	YNA	—
N000-0369	D9,M15,Exp.	NA	1,399	1,473	1,421	1,232	1,358
N000-0403	D9,M15,Exp.	NA	1,426	1,667	1,514	1,318	1,449
N000-0725	D9,M15,Exp.	NA	1,201	1,753	1,363	1,146	1,291
N000-0741	D9,M15,Exp.	NA	1,474	1,770	1,599	YNA	—
NL97-0219	D9,M15,Exp.	MR	1,261	1,192	1,203	911	1,106
NL98-0944	D9,M15,Exp.	R	1,588	1,637	1,603	1,330	1,512
PHS00-833	D3,M2,Exp	R	1,682	1,846	1,779	1,617	1,725
PHS00-842	D3,M2,Exp	R	1,748	1,898	1,738	1,595	1,690
PHS00-858	D3,M2,Exp	R	1,612	1,779	1,694	YNA	—
PHS00-915	D3,M2,Exp	R	1,387	1,668	1,494	1,507	1,498
Thunder	D4,M8,Op	MR	1,437	1,715	1,480	930	1,297
Mean			1,442	1,708	1,551	1,208	1,412
LSD (0.05)			208.9	232.5	189.4	229.2	149.9
C.V.			8.9	9.7	10.7	11.6	11.4

Growth characteristics and oil content of Non-Roundup Ready canola varieties grown near Roseau, seeded May 14, 2001.

*Yield was analyzed using three replicates.

**Note – Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

Variety	Yield,* Lb/Acre at 8% Moisture	Oil, % of Seed Weight at 0% Moisture	Days After Planting to			Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % Incidence
			95% Canopy Closure	Beginning Bloom	Maturity: 30% Seed Color Change on Main Raceme			
46A76	1,352	46.3	36	47	86	51	1.3	10
Canterra 1492	1,442	46.0	35	45	86	46	2.0	13
CL 2070	1,362	45.2	36	47	86	48	2.0	10
Cracker Jack	1,143	45.6	36	47	87	51	2.0	20
Ebony	1,410	47.2	36	46	86	48	2.3	13
Hudson	1,387	46.6	36	45	83	43	2.7	27
HyClass 601	1,449	46.4	35	46	87	51	2.0	13
Hylite 243	927	45.5	36	49	86	50	3.0	17
Hyola 330	1,584	47.6	35	44	85	41	3.7	17
Hyola 401	1,958	46.6	34	44	86	43	3.3	10
IMC 205	1,472	48.9	36	46	86	47	1.7	13
IMC 207	1,403	47.0	36	45	86	46	4.0	10
IMC 302	1,368	44.5	36	46	86	50	3.0	17
InVigor 2573	1,701	45.2	35	46	86	50	2.0	20
InVigor 2643	1,614	45.9	36	46	85	48	2.7	10
InVigor 2663	1,655	46.4	34	47	85	54	2.3	17
KAB 36	1,365	47.4	36	45	85	52	3.3	20
LG 3366	1,362	45.2	36	46	85	50	1.7	10
LiBred-279	1,385	49.3	36	43	85	47	3.0	23
Minot **	1,306	47.1	36	45	86	44	3.0	20
N000-0079	1,300	45.8	35	45	87	46	4.0	17
N000-0346	1,430	45.0	35	46	86	52	2.3	10
N000-0369	1,399	47.0	35	45	85	45	2.0	17
N000-0403	1,426	46.5	35	45	85	41	2.0	17
N000-0725	1,201	46.2	36	45	84	47	2.6	17
NOG0-0741	1,474	47.7	36	45	85	46	3.0	23
NL97-0219	1,261	45.7	36	45	85	46	3.3	10
NL98-0944	1,588	47.3	35	44	86	47	2.0	10
PHS00-833	1,682	44.2	35	46	86	52	1.7	13
PHS00-842	1,748	46.1	34	48	86	53	2.7	13
PHS00-858	1,612	45.4	35	45	85	48	2.7	17
PHS00-915	1,387	46.6	34	46	85	48	2.7	27
Thunder	1,437	47.6	36	44	84	44	3.0	23
Mean	1,442	46.4	35.2	46	86	48	2.6	16
LSD (0.05)	208.9	2.05	0.93	1.6	1.6	4.2	1.09	9.9
C.V.	8.9	3.2	1.9	2.1	1.1	5.4	25.9	38.1

Growth characteristics and oil content of Non-Roundup Ready canola varieties grown near Red Lake Falls, seeded May 12, 2001.

*Note – Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Weight at 0% Moisture	Days After Planting to		Height, Inches	Lodging, 1 = Erect 9 = Flat
			Beginning Bloom	Maturity: 30% Seed Color Change on Main Raceme		
46A76	1,792	44.5	48	87	47	1.0
Canterra 1492	1,817	43.8	45	85	45	1.3
CL 2070	1,482	42.5	48	87	47	1.0
Cracker Jack	1,267	41.2	47	87	46	1.0
Ebony	1,719	45.1	48	86	46	1.0
Hudson	1,453	42.1	44	84	43	1.3
HyClass 601	1,587	42.6	47	87	48	1.0
Hyllite 243	1,687	42.9	48	85	45	1.5
Hyola 330	2,007	45.2	44	83	39	2.0
Hyola 401	2,015	43.5	44	86	39	2.0
IMC 205	1,738	45.8	46	84	42	1.5
IMC 207	1,780	44.4	45	85	41	3.5
IMC 302	1,687	41.4	47	87	47	1.5
InVigor 2573	1,848	44.0	47	85	51	1.3
InVigor 2643	1,668	44.6	46	85	45	1.3
InVigor 2663	1,982	44.0	47	85	47	1.8
KAB 36	1,925	46.1	46	85	45	1.3
LG 3366	1,773	44.1	45	86	45	1.0
LiBred-279	1,608	45.0	43	84	41	2.3
Minot *	1,763	45.1	46	85	42	1.5
N000-0079	1,596	46.6	47	86	45	2.5
N000-0346	1,786	42.9	47	86	45	1.0
N000-0369	1,473	43.9	45	85	41	1.3
N000-0403	1,667	43.0	45	85	39	1.0
N000-0725	1,753	43.0	45	84	44	1.8
N000-0741	1,770	44.4	45	84	43	2.0
NL97-0219	1,192	41.3	45	86	41	1.8
NL98-0944	1,637	46.1	45	84	43	1.8
PHS00-833	1,846	43.4	46	85	47	1.3
PHS00-842	1,898	43.8	47	85	49	1.8
PHS00-858	1,779	43.2	45	85	45	1.5
PHS00-915	1,668	45.2	47	85	44	1.0
Thunder	1,715	45.2	42	83	41	3.0
Mean	1,708	43.9	46	85	44	1.6
LSD (0.05)	232.5	1.11	0.8	0.9	2.4	0.74
C.V.	9.7	1.8	1.2	0.7	3.8	33.8

Growth characteristics and oil content of Non-Roundup Ready canola varieties grown near Kennedy, seeded May 19, 2001.

*YNA = Yield not available due to wind damage after swathing. Three replicates were analyzed for the remainder of the varieties.

**Note - Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Weight at 0% Moisture	Days After Planting to			Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % Incidence
			95% Canopy Closure	Beginning Bloom	Maturity: 30% Seed Color Change on Main Raceme			
46A76	1,212	43.6	35	47	86	42	1.0	10
Canterra 1492	1,269	43.3	35	43	85	41	1.3	13
CL 2070	1,114	41.7	36	45	85	40	1.3	10
Cracker Jack	831	43.5	36	46	86	39	1.3	10
Ebony	1,275	46.3	36	45	85	40	1.0	10
Hudson	YNA*	43.0	36	43	83	37	1.5	13
HyClass 601	1,245	43.1	35	45	86	41	1.3	10
Hylite 243	776	42.4	36	48	84	37	2.0	10
Hyola 330	YNA*	44.3	34	42	82	32	2.0	23
Hyola 401	YNA*	NA	34	42	84	32	2.0	10
IMC 205	YNA*	45.3	35	45	84	37	1.0	10
IMC 207	1,155	43.5	35	43	86	34	2.8	10
IMC 302	923	43.0	36	47	85	38	1.3	15
InVigor 2573	1,688	44.2	34	44	84	44	1.8	18
InVigor 2643	1,231	43.8	35	44	83	40	2.0	15
InVigor 2663	YNA*	44.8	34	44	83	41	1.5	15
KAB 36	1,178	46.4	35	43	83	38	2.0	10
LG 3366	1,206	43.7	36	46	86	40	1.0	10
LiBred-279	1,120	45.6	35	43	84	34	2.3	13
Minot **	950	44.8	36	45	85	32	1.8	10
N000-0079	1,430	44.9	35	43	85	35	2.5	10
N000-0346	YNA*	43.6	35	43	84	38	1.0	10
N000-0369	1,232	44.6	34	43	84	36	1.8	10
N000-0403	1,318	43.3	35	43	83	34	1.8	13
N000-0725	1,146	42.1	35	43	84	37	2.3	13
N000-0741	YNA*	44.2	35	44	82	35	2.3	20
NL97-0219	911	44.0	36	43	83	35	2.3	15
NL98-0944	1,330	45.3	35	43	82	37	1.3	15
PHS00-833	1,617	43.5	35	44	83	42	1.8	15
PHS00-842	1,595	44.1	34	45	82	42	2.0	20
PHS00-858	YNA*	43.0	34	43	82	36	1.8	28
PHS00-915	1,507	44.6	35	43	82	38	1.3	15
Thunder	930	43.5	35	42	84	36	1.8	10
Mean	1,208	44.0	35	44	84	37	1.7	13
LSD (0.05)	229.2	1.01	0.5	0.8	1.0	3.7	0.73	7.4
C.V.	11.6	1.6	1.4	1.3	0.8	7.1	31.2	39.8

Seed yield of Roundup Ready canola varieties, lb/acre at 8% moisture, at Roseau, Kennedy, Red Lake Falls and Grygla in 2001.

Variety information includes Source Codes: (D#=Developer: M#=Marketer) keyed to listing, page 53, and these supplemental codes: H=Hybrid,

Op=Open Pollinated, Syn=Synthetic.

*Average yields were analyzed using three replicates from each site. **Note – Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials. ***YNA=Yield not available due to wind damage after swathing.

Blackleg Resistance rating provided by seed companies: R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible.

Variety	Variety Information	Blackleg Resistance	Average				Average,* All 4 Sites	
			Roseau	Red Lake Falls	Roseau, Red Lake Falls	Kennedy Grygla		
45A55	D7,M11,Op	R	1,491	1,973	1,732	1,198	1,540	1,565
A99-46NR	D10,M7,Op	R	1,512	1,410	1,461	YNA***	1,558	–
Canterra 1812	D2,M3,Syn	R	1,070	1,454	1,262	714	1,081	1,065
Canterra 1867	D5,M3,Op	MR	1,285	1,769	1,527	1,088	1,145	1,310
Conquest	D10,M7,Op	R	1,219	1,446	1,333	YNA	YNA	–
DKL 223	D1,M7,H	MS	1,475	1,701	1,588	1,286	1,550	1,497
DKL 23-38	D6,M10,Op	MR	1,298	1,563	1,431	1,218	1,156	1,314
DKL3455	D6,M10,Op	MR	1,211	1,559	1,385	742	1,089	1,155
LG3525	D6,M9,Op	MR	1,437	1,833	1,635	1,049	1,403	1,432
DS Roughrider	D2,M12,Op	MR	1,471	1,629	1,550	1,363	YNA	–
Gladiator	D8,M7,Syn	MR	1,533	1,833	1,683	1,092	1,456	1,468
GoldenReady RR	D6,M13,Op	MR	1,523	1,658	1,591	1,030	1,071	1,324
Hybrid 104	D2,M12,H	MR	1,416	1,797	1,607	1,392	1,060	1,411
HyClass 2061	D2,M4,H	MR	1,544	1,836	1,690	1,398	1,367	1,538
HyClass 799	D4,M4,Syn	R	1,245	1,766	1,505	1,163	929	1,258
Hyola 357	D1,M7,H	MS	1,722	1,629	1,675	1,243	1,782	1,583
IMC 203 RR	D5,M6,Op,Sp	S	1,298	YNA	–	1,238	765	–
IMC 206 RR	D5,M6,Op,Sp	MS	1,246	1,435	1,340	1,091	YNA	–
LiBred 399	D4,M14,Syn	MR	1,257	1,506	1,382	917	1,248	1,257
LiBred 449	D4,M14,Op	R	1,184	1,637	1,411	1,039	1,038	1,211
LiBred 499	D4,M14,H	R	1,465	1,704	1,584	1,135	1,176	1,377
LiBred 5445	D4,M14,Op	R	1,073	1,384	1,229	919	933	1,084
LiBred 5610	D4,M14,Op	R	1,367	1,807	1,587	1,030	1,357	1,372
Minot **	D2,M4,Op	MR	1,424	1,759	1,591	1,101	802	1,263
OHKA139	D5,M6,H,Sp	MS	1,196	1,464	1,330	YNA	1,327	–
PR 5631	D6,M10,Op	R	1,427	1,674	1,550	1,259	1,330	1,418
PR 5671	D6,M10,Op	R	1,370	1,796	1,583	1,311	976	1,369
RideR	D8,M10,Syn	MR	1,257	1,643	1,450	YNA	1,431	–
RuleRR	D8,M5,H,Syn	MR	1,571	1,661	1,616	955	1,344	1,365
SW BadgeRR	D8,M13,Syn	MS	1,325	1,713	1,519	1,230	YNA	–
SW C5015 RR	D8,M15,Syn	MS	1,570	1,653	1,612	1,087	1,428	1,431
SW C5031 RR	D8,M15,Syn	MS	1,436	1,853	1,645	YNA	1,275	–
SW D 5113 RR	D8,M7,H	MR	1,630	1,845	1,737	1,298	1,365	1,567
SW D5066 RR	D8,M15,Syn	MR	1,465	1,616	1,540	1,219	1,278	1,382
SW D5099 RR	D8,M5,H,Syn	MR	1,373	1,670	1,521	929	1,208	1,319
SW RaideRR	D8,M5,Op	MR	1,448	1,759	1,604	1,216	961	1,348
SW Razor	D8,M12,Op	MR	1,179	YNA	–	987	1,255	–
SW WaRRior	D8,M15,Syn	MR	1,249	1,639	1,444	YNA	1,217	–
SW-P 98-0029	D9,M15,Syn	MR	1,298	1,618	1,458	YNA	1,327	–
SW-P 98-5884	D9,M15,Syn	MR	1,432	1,758	1,595	1,272	1,524	1,497
SW-P 98-6468	D9,M15,Syn	MR	1,237	1,683	1,460	996	1,335	1,312
SW-P 98-6653	D9,M15,Syn	MR	1,439	1,666	1,552	1,147	YNA	–
SW-P9828000	D9,M15,Syn	MR	1,403	YNA	–	1,145	1,416	–
Mean			1,374	1,670	1,525	1,124	1,252	1,362
LSD (0.05)			194.9	178.3	130.9	249.5	401.7	143.4
C.V.			10.1	7.6	8.7	13.6	19.7	13.1

Growth characteristics and oil content of Roundup Ready canola varieties grown near Roseau, seeded May 14, 2001.

**Note – Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Weight at 0% Moisture	Days After Planting to			Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % Incidence
			95% Canopy Closure	Beginning Bloom	Maturity: 30% Seed Color Change on Main Raceme			
45A55	1,491	45.8	35	46	84	42	2.5	0
499-46NR	1,512	45.5	35	45	84	40	2.8	10
Canterra 1812	1,070	46.5	36	47	86	45	2.0	30
Canterra 1867	1,285	46.4	36	48	86	47	2.8	20
Conquest	1,219	45.7	35	48	87	46	2.3	13
DKL 223	1,475	44.8	35	44	85	39	4.0	0
DKL 23-38	1,298	46.7	35	45	85	40	2.8	15
DKL3455	1,211	46.3	36	46	86	44	2.5	20
LG3525	1,437	46.4	36	47	86	45	2.8	13
DS Roughrider	1,471	48.6	35	47	87	48	3.0	23
Gladiator	1,533	47.5	35	45	84	45	2.0	10
GoldenReady	1,523	45.5	36	46	87	45	3.3	15
Hybrid 104	1,416	46.1	35	47	87	48	2.0	15
HyClass 2061	1,544	47.4	35	46	86	47	1.5	23
HyClass 799	1,245	45.4	35	47	85	46	1.3	15
Hyla 357	1,722	45.7	35	44	86	40	3.8	20
IMC 203	1,298	44.0	35	48	86	49	3.8	23
IMC 206	1,246	44.4	35	47	84	44	3.3	20
LiBred 399	1,257	45.2	36	47	86	47	2.3	13
LiBred 449	1,184	43.8	35	46	84	45	3.5	23
LiBred 499	1,465	45.5	35	46	86	47	2.5	8
LiBred 5445	1,073	43.9	36	47	86	49	2.5	0
LiBred 5610	1,367	46.5	36	47	86	48	3.0	0
Minot **	1,424	47.0	36	46	86	41	2.8	0
OHKA139	1,196	44.5	35	47	86	49	2.3	0
PR 5631	1,427	45.7	36	45	86	41	3.5	0
PR 5671	1,370	45.2	36	47	87	46	2.8	20
RideR	1,257	45.5	35	46	85	47	2.5	15
RuleRR	1,571	47.6	34	45	86	45	2.0	13
SW BadgeRR	1,325	46.0	35	47	86	46	2.3	18
SW C5015	1,570	46.5	36	46	86	47	2.3	13
SW C5031	1,436	45.3	34	45	85	46	2.0	13
SW D 5113	1,630	48.0	35	45	86	47	2.0	18
SW D5066	1,465	45.8	36	47	86	47	2.8	18
SW D5099	1,373	46.3	36	46	86	47	2.0	20
SW RaideRR	1,448	45.4	36	47	86	37	2.0	25
SW Razor	1,179	45.4	35	46	85	45	2.3	23
SW WaRRior	1,249	45.4	36	47	86	49	2.3	18
SW-P 98-0029	1,298	47.5	35	47	87	45	2.3	20
SW-P 98-5884	1,432	47.5	35	47	86	46	2.3	20
SW-P 98-6468	1,237	45.8	35	46	87	45	1.3	25
SW-P 98-6653	1,439	45.8	35	46	86	47	1.5	20
SW-P9828000	1,403	45.6	36	47	86	48	1.5	20
Mean	1,374	45.9	35	46	86	45	2.5	15
LSD (0.05)	194.9	1.24	0.8	0.879	0.923	6.4	0.73	9.2
C.V.	10.1	1.9	1.6	1.4	0.8	10.1	21.1	44.2

Growth characteristics and oil content of Roundup Ready canola varieties grown near Red Lake Falls, seeded May 12, 2001.

*YNA= Yield not available due to wind damage after swathing.

**Note - Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Weight at 0% Moisture	Days After Planting to		Height, Inches	Lodging, 1 = Erect 9 = Flat
			Beginning Bloom	Maturity: 30% Seed Color Change on Main Raceme		
45A55	1,973	45.4	46	82	43	2.3
A99-46NR	1,410	44.4	45	81	43	2.3
Canterra 1812	1,454	45.8	45	85	44	1.0
Canterra 1867	1,769	45.9	46	85	43	1.5
Conquest	1,446	46.2	48	85	45	1.0
DKL 223	1,701	45.1	43	83	40	3.3
DKL 23-38	1,563	46.5	44	84	42	1.8
DKL3455	1,559	46.7	45	85	45	1.3
LG3525	1,833	47.4	46	85	44	2.3
DS Roughrider	1,629	48.6	46	85	42	2.0
Gladiator	1,833	47.1	45	83	44	1.5
GoldenReady	1,658	45.5	45	85	43	2.5
Hybrid 104	1,797	47.4	46	86	46	1.0
HyClass 2061	1,836	47.3	45	85	46	1.9
HyClass 799	1,766	45.9	46	85	46	1.0
Hyola 357	1,629	44.2	44	84	40	2.5
IMC 203	YNA*	44.5	47	83	42	4.3
IMC 206	1,435	43.4	47	84	41	3.9
LiBred 399	1,506	46.0	46	85	44	1.0
LiBred 449	1,637	45.8	45	82	40	2.5
LiBred 499	1,704	46.3	46	84	45	1.8
LiBred 5445	1,384	45.1	47	85	45	1.9
LiBred 5610	1,807	47.1	46	85	42	1.8
Minot **	1,759	46.8	45	84	44	1.5
OHKA139	1,464	44.7	47	86	46	1.5
PR 5631	1,674	45.9	44	84	39	2.8
PR 5671	1,796	45.7	45	86	44	1.0
RideR	1,643	46.4	45	84	44	1.3
RuleRR	1,663	47.8	45	85	45	1.0
SW BadgeRR	1,713	46.2	46	85	46	1.8
SW C5015	1,853	47.0	45	84	42	1.3
SW C5031	1,853	46.6	45	84	45	1.0
SW D 5113	1,845	47.3	45	85	44	1.8
SW D5066	1,616	46.5	47	84	44	1.3
SW D5099	1,670	46.7	45	84	45	1.3
SW RaiderRR	1,759	45.8	47	86	47	1.3
SW Razor	YNA*	45.0	45	83	43	1.8
SW Warrior	1,639	46.1	46	85	44	1.0
SW-P 98-0029	1,618	47.7	46	85	43	1.0
SW-P 98-5884	1,758	47.5	46	85	45	1.3
SW-P 98-6468	1,693	45.3	46	86	44	1.0
SW-P 98-6653	1,666	46.3	46	83	46	1.3
SW-P 98-6900	YNA*	46.2	47	86	40	1.8
Mean	1,670	46.2	46	84	44	1.6
LSD (0.05)	178.3	0.99	0.9	1.0	2.6	0.80
C.V.	7.6	1.5	1.5	0.9	4.3	35.1

Growth characteristics and oil content of Roundup Ready canola varieties grown near Kennedy, seeded May 19, 2001.

*YNA = Yield not available due to wind damage after swathing. Three replicates were analyzed for the remainder of the varieties.

**Note - Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Weight at 0% Moisture	Days After Planting to				Lodging, 1 = Erect 9 = Flat	Sclerotinia, % Incidence
			95% Canopy Closure	Beginning Bloom	Maturity: 30% Seed Color Change on Main Raceme	Height, Inches		
45A55	1,198	45.4	35	45	80	34	2.5	38
A99-46NR	YNA*	44.4	35	43	80	30	2.5	33
Canterra 1812	714	45.8	39	46	84	37	1.5	13
Canterra 1867	1,088	45.9	36	46	82	38	2.3	25
Conquest	YNA*	46.2	35	46	83	41	2.0	25
DKL 223	1,286	45.1	34	42	81	32	3.0	38
DKL 23-38	1,218	46.5	36	44	82	33	2.8	30
DKL3455	742	46.7	36	44	82	36	1.8	40
LG3525	1,049	47.4	36	45	82	37	2.0	35
DS Roughrider	1,363	48.6	36	44	85	38	2.3	13
Gladiator	1,092	47.1	35	44	80	40	2.0	65
GoldenReady	1,030	45.5	36	44	83	37	2.8	23
Hybrid 104	1,392	47.4	36	44	85	41	1.5	20
HyClass 2061	1,398	47.3	35	44	83	38	1.8	23
HyClass 799	1,163	45.9	35	45	82	42	1.5	28
Hyola 357	1,243	44.2	34	42	82	33	3.0	20
IMC 203	1,238	44.5	35	47	83	37	3.0	25
IMC 206	1,091	43.4	35	45	82	36	2.8	15
LiBred 399	917	46.0	36	45	82	41	1.5	45
LiBred 449	1,039	45.8	35	44	79	36	2.5	70
LiBred 499	1,135	46.3	35	44	81	39	1.8	33
LiBred 5445	919	45.1	36	47	85	41	1.3	15
LiBred 5610	1,030	47.1	36	45	84	41	2.0	20
Minot **	1,101	46.8	36	44	83	34	2.0	15
OHKA139	YNA*	44.7	35	46	84	43	2.3	20
PR 5631	1,259	45.9	35	44	82	33	2.5	23
PR 5671	1,311	45.7	35	44	84	40	2.0	13
RideR	YNA*	46.4	35	44	81	40	1.8	55
RuleRR	955	47.8	35	44	82	35	1.8	23
SW BadgeRR	1,230	46.2	35	44	82	38	2.0	35
SW C5015	1,087	47.0	36	44	82	38	1.5	38
SW C5031	YNA*	46.6	35	44	82	42	1.3	33
SW D 5113	1,298	47.3	35	43	82	38	1.3	58
SW D5066	1,219	46.5	35	44	82	41	1.5	30
SW D5099	929	46.7	36	44	81	40	1.8	38
SW RaideRR	1,216	45.8	36	47	85	44	1.0	18
SW Razor	967	45.0	35	44	81	37	1.5	38
SW WaRRior	YNA*	46.1	35	44	82	40	1.8	30
SW-P 98-0029	YNA*	47.7	35	45	83	41	2.3	20
SW-P 98-5884	1,272	47.5	35	45	84	41	1.8	15
SW-P 98-6468	996	45.3	35	44	83	43	1.8	25
SW-P 98-6653	1,147	46.3	35	44	82	42	1.5	30
SW-P9828000	1,145	46.2	36	45	84	41	1.5	20
Mean	1,124	46.2	35	44	82	38	2.0	29
LSD (0.05)	249.5	0.99	0.5	0.8	1.3	3.0	0.70	15.7
C.V.	13.6	1.5	1.1	1.3	1.1	5.6	25.8	38.2

Growth characteristics and oil content of Non-Roundup Ready canola varieties grown near Grygla, seeded May 14, 2001.

*YNA = Yield not available due to wind damage after swathing. Three replicates were analyzed for the remainder of the varieties.

**Note – Minot is a Roundup Ready check variety for the non-Roundup Ready and Roundup Ready trials.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Weight at 0% Moisture	Days After Planting to			Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % Incidence
			95% Canopy Closure	Beginning Bloom	Maturity: 30% Seed Color Change on Main Raceme			
45A55	1,540	40.2	34	45	87	43	7.5	58
A99-46NR	1,558	39.9	34	45	87	43	6.5	40
Canterra 1812	1,081	41.0	36	46	89	46	2.0	35
Canterra 1867	1,145	39.5	34	46	89	45	6.0	43
Conquest	YNA*	40.0	33	46	89	49	3.3	48
DKL 223	1,550	39.8	32	45	88	45	7.3	45
DKL 23-38	1,156	41.4	35	46	89	43	5.8	50
DKL3455	1,089	42.0	34	47	89	45	3.0	40
LG3525	1,403	41.4	34	46	88	46	5.5	50
DS Roughrider	YNA*	NA	35	46	89	46	6.8	40
Gladiator	1,456	39.8	32	45	88	51	4.5	43
GoldenReady	1,071	40.3	35	46	89	44	6.5	40
Hybrid 104	1,060	40.9	34	46	89	48	4.8	35
HyClass 2061	1,367	41.9	33	46	89	46	4.0	38
HyClass 799	929	40.8	34	46	88	48	2.3	48
Hyola 357	1,782	40.4	32	44	89	46	5.3	25
IMC 203	765	38.0	33	47	90	47	6.8	55
IMC 206	YNA*	NA	32	46	89	48	8.0	50
LiBred 399	1,248	40.3	35	46	89	45	5.3	45
LiBred 449	1,038	41.1	34	46	89	43	6.5	45
LiBred 499	1,176	40.8	34	45	89	50	5.5	38
LiBred 5445	933	39.9	35	46	88	45	4.0	40
LiBred 5610	1,357	41.7	33	46	89	47	4.3	45
Minot **	802	42.1	35	47	89	42	4.5	40
OHKA139	1,327	39.0	33	47	89	53	5.3	43
PR 5631	1,330	40.8	34	45	89	42	6.5	30
PR 5671	976	39.8	34	46	89	49	5.5	33
RideR	1,431	39.9	34	46	89	47	7.5	40
RuleRR	1,344	42.4	34	46	90	47	4.0	28
SW BadgeRR	YNA*	40.9	33	46	89	48	6.5	30
SW C5015	1,428	41.1	33	44	89	47	4.5	48
SW C5031	1,275	40.1	34	45	88	48	5.5	45
SW D 5113	1,365	40.7	33	46	89	47	5.3	45
SW D5066	1,278	40.7	34	46	89	47	6.0	38
SW D5099	1,288	40.5	34	45	89	49	3.5	43
SW RaideRR	961	40.7	33	47	89	49	2.8	35
SW Razor	1,255	38.7	34	46	89	46	8.0	43
SW WaRRior	1,217	40.5	35	46	89	47	6.0	38
SW-P 98-0029	1,327	41.9	34	45	89	48	5.3	35
SW-P 98-5884	1,524	41.4	33	46	89	46	3.0	25
SW-P 98-6468	1,335	40.0	34	45	89	48	2.8	35
SW-P 98-6653	YNA*	40.1	33	46	89	48	5.0	23
SW-P9828000	1,416	39.9	35	46	89	48	4.3	33
Mean	1,252	40.5	34	46	89	46	5.2	40
LSD (0.05)	401.7	1.29	0.9	0.9	0.7	4.3	2.36	13.5
C.V.	19.7	2.3	1.8	1.4	0.6	6.6	32.5	24.2



Soybean Maturity Zones.

SOYBEAN

The table on page 77 provides results from the special performance tests of soybean cyst nematode resistant varieties in "infested" field sites near Lamberton, Waseca, and Madelia and "non-infested" field sites near Fairmont, Lamberton,

Potsdam and Waseca. Planting techniques were the same as the regular performance tests.

Tables on pages 78-79 provide performance and characteristics data from special-use soybean variety tests. These tests were conducted to provide reliable data for growers interested in producing these types of soybeans, which are typically grown under contract.

The table on page 80 provides important variety characteristics of publicly developed varieties entered in the 2001 tests.

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

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 date is determined visually by noting the actual date when 95 percent of the pods show their genetically programmed mature color. These dates for 2001 are provided in the tables. Harvest dates are typically 7 to 14 days later, depending upon drying conditions.

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 Agassiz is indicated as 0.0, making it the earliest 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 2001 calendar date of maturity and not yield performance.

Later maturing varieties can usually 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.

This year the yield information is presented as a percent of the mean of the test. The actual mean value is given at the bottom of each table. Values over 100 indicate the 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-percent level of significance is used in all these tables. This means that yield differences exceeding the stated LSD values are real 80 percent 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 Granite Falls and Foxhome in 2001. Comparing chlorosis scores of varieties enables 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.

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

Tables on pages 66-69 present data from the regular public and private variety tests that are conducted annually at various locations within the northern, central and southern production zones. The map shows maturity zone boundaries. All of these tests were planted between May 1 and June 5 at planting rates of 160,000 plants/acre. Herbicides were used as necessary for good weed control. Row spacings were 30 inches at Becker and Fairmont and 10 inches at other locations. Plot combines were used to harvest the yield from all plots.

Tables on page 69 provide results of the very early (northern Minnesota) and special southeastern Minnesota public variety tests. These locations were added to provide data for environments not represented by the other location tests.

Tables on pages 69-76 provide results from specific tests of available Roundup Ready® varieties adapted to the northern, central and southern production zones. Planting was accomplished as described above, except that the only herbicide used was two applications of labeled rates of Roundup®.

Chlorosis symptoms for all varieties in these 2001 tests were much more severe than in some of the previous years. Specific scores and evaluation dates from the 2001 test at both locations 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)

Protein and Oil

Protein and oil values were determined from mature seed using near infrared reflectance analysis equipment. The table values are for the 2001 season only. This year the protein and oil information is being presented as a percent of the mean of the 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 were 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-percent moisture basis. This formula converts 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:

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

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 your field. Genes can be incorporated into varieties to provide resistance to specific races of this disease.

Some published information refers to Phytophthora "tolerance" or "field resistance," which is not race-specific and should not be confused with race specific resistance. 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. The "Genes for resistance" chart shows which genes provide resistance to the various races.

Genes for resistance to various races of Phytophthora root rot.

Gene Races

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Rps1, 1a																												
Rps1b																												
Rps1c																												
Rps1k																												
Rps3																												
Rps4																												
Rps6																												

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 the soybean is 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, moderately resistant, moderately susceptible and resistant varieties planted in infested and non-infested fields in southern Minnesota are provided on page 77. The ratings for SCN resistance were determined using nematode counts from naturally infested field sites and a greenhouse test using a Minnesota field population of SCN.

Additional information on procedures for testing your fields for SCN can be obtained from your county extension office or the Soybean Nematology Lab at the Southern Research and Outreach Center, Waseca, MN 56093.

Management information is available from your county extension office or from the Minnesota Soybean Research and Promotion Council, 360 Pierce Avenue, Suite 110, North Mankato, MN 56003, 1-888-896-9678, www.mnsoybean.org.

White Mold

White mold, also known as Sclerotinia stem rot, has developed with increasing frequency in Minnesota soybean fields. Planting less-susceptible varieties in wider row spacings and planting at lower populations are the most effective methods of reducing disease severity.

Accurate ratings for soybean variety resistance to white mold are difficult to obtain because both infection and disease development are affected by weather conditions during and after flowering. Because of this variability, a

variety's performance can change significantly among locations and years, depending on the interaction of plant development, precipitation and temperature. Growers concerned about variety performance in the presence of white mold should select varieties that show consistently less white mold over several years of testing.

2001 White mold evaluation plots were planted at eight locations in Minnesota (Shelly, Fosston, Staples, Morris, Farmington, Rosemount, Lamberton, and Waseca). Because environmental conditions were not favorable for consistent white mold growth, no meaningful data were obtained from these plots.

Additional white mold information is available at:
www.soybeans.umn.edu/home.htm.

rown Stem Rot

rown 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. IA 1006, Reeborn, Granite, Faribault, Archer, and IA2008R are available public varieties with resistance to BSR, while privately developed varieties 2063RR, Ex-547RRN, Ex-097RR, Ex-467RR, Ex-547RRN, 1719RR, and 2169RR are reported to be resistant to BSR.

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

pecial Use Varieties

Recently there has been increased interest in producing soybeans with special characteristics important to specialty food product manufacturers. 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.

Privately developed varieties.

Contact addresses and brand names for privately developed varieties entered in these tests are:

Advantage Soybean Seed (Advantage), 17303 Highway 22, Good Thunder, MN 56037

AgriPro Seeds (AP), 2369 330th St., Box 500, Slater, IA 50244

Albert Lea Seed House (Viking), P.O. Box 127, 1414 W. Main, Albert Lea, MN 56007

Anderson Seeds (Anderson), RR 3 Box 94, St. Peter, MN 56082

Crow's Hybrid Corn Co. (Crow's), Box 306, Milford, IL 60953

Dahlco Seeds (Dahlco), 14730 15th St. S.W., Cokato, MN 55321

Dahlman Seeds (Dahlman), 73504 200th St., Dassel, MN 55325

Dairyland Seed Co., Inc. (Dairyland), P.O. Box 150, 209 Main St., Gilbert, IA 50105

Dennis Ewing Farm Seed (Yield King), 6131 North Fork Road, Ames, IA 50010

Farm Advantage (Farm Advantage), 1275 Hwy 69, Belmond, IA 50421

Gold Country Seed, Inc. (GCS), 16506 Hwy. 15 N., P.O. Box 604, Hutchinson, MN 5535

Golden Harvest (Golden Harvest), P.O. Box A, Waterloo, NE 68069

Great Lakes Hybrids, Inc. (Great Lakes), 9915 W. M-21, Ovid, MI 48866

Hyland Seeds (Hyland), Box 130, 2 Hyland Drive, Blenheim, ON, Canada NOP1A0

Jung Seed Genetics (Jung), 341 S. High St., Randolph, WI 53956

Kruger Seed Company (Kruger), Highway 20 East, Box A, Dike, IA 50624

KSC/Challenger (KSC/Challenger), Box A, Dike, IA 50624

Latham Brothers Farm (Latham), 131 180th St., Alexander, IA 50420

Latham Seed Company (Latham), 131 180th St., Alexander, IA 50420

LG Seeds (LG), 710 N. Main St., Suite 201, River Falls, WI 54022

Mallard Seed Co. (Mallard), P.O. Box 637, Plainview, MN 55964

Midwest Seed Genetics (MW Genetics), P.O. Box 518, Carroll, IA 51401

Monsanto Global Seed Group (Dekalb), 3100 Sycamore Road, De Kalb, IL 60115

Mustang Seed (Mustang), Box 466, Madison, SD 57042

NorthStar Genetics (NS), Box 40, Wanamingo, MN 55983

Pioneer Hi-Bred International, Inc. (Pioneer), 921 Darien Dr., Madison WI 53717

Profiseed, Inc. (Profiseed), 1691 Highway 65, Hampton, IA 50441

Prairie Brand Research (PBR), 15 X Ave., Story City, IA 50248

Prairie Brand Seed Company (Prairie Brand), 15 X Ave., Story City, IA 50248

Ramy International, Ltd. (Ramy), 1329 N. Riverfront Drive, Mankato, MN 56001

Renk Seed Co. (Renk), 6800 Wilburn Rd., Sun Prairie, WI 53590

Sand Seed Service, Inc. (Sands), P.O. Box 648, Marcus, IA 51035

Sansgaard Seed Farms, Inc. (Sansgaard), 15 X Avenue, Story City, IA 50248

Seeds 2000 (Seeds 2000), P.O. Box 200, Breckenridge, MN 56520

Sodak Genetics (Sodak Genetics), Box 2207A, SDSU, Brookings, SD 57007

Stine Seed Co. (Stine), 2225 Laredo Trail, Adel, IA 50003

Stine Seed Farm (Stine), 2225 Laredo Trail, Adel, IA 50003

Syngenta Seeds (NK Brand), 3701 W 49th St., Suite 206, Sioux Falls, SD 57106

Thompson Agronomics, Inc. (Thompson), 40321 130th Avenue, Leland, IA 50453

Thompson Seeds, Inc. (Thompson), 40321 130th Ave., Leland, IA 50453

Thunder Seed (Thunder) 3008 210th St. N., Hawley, MN 54549

Top Farm Hybrids (Top Farm), P.O. Box 850, Cokato, MN 55321

Trelay Seeds (High Cycle's Trelay), 11623 State Road 80, Livingston, WI 53544

UAP Seed (Dyna-Gro), P.O. Box 10, Wall Lake, IA, 51466

United Suppliers Inc. (U.S. Seeds) 30473 260th St., P.O. Box 538, Eldora, IA 50627

Wensman Seed Company (Wensman), P.O. Box 190, Wadena, MN 56482

Ziller Seed Co., Inc. (Ziller), 76374 380th St., Bird Island, MN 55310

Tables on pages 78-79 present the most recent data available on the performance and characteristics of several of these special use varieties. Contact the owner/developer or exclusive marketing company if you are interested in further information about these varieties.

Publicly Developed Varieties

Important characteristics of the publicly developed varieties entered in 2001 tests are presented on page 80.

Soybean Planting Rate and Date

Bushel Weight, Pounds	60
Seeds/Pound.....	2,800
Planting Rate, Pounds/Acre	56
Planting Rate, Seeds/Ft. of Row	
7-inch rows.....	2
10-inch rows.....	3
20-inch rows.....	6
22-inch rows.....	7
30-inch rows.....	9
Planting Date.....	May 1 to May 10

Performance and characteristics of public and private soybean varieties, northern zone; Crookston, Moorhead and Shelly 1999-2001.

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
McCall	Minn. AES	9-11	76	77	87	97	98	00.7	S	3.7
90A07	Pioneer	9-13	-	87	96	98	107	00.7	S	3.2
Glacier	Minn. AES	9-15	104	98	97	100	98	00.8	Rps6	4.3
Jim	N.D. AES	9-16	96	95	104	101	97	00.8	S	3.7
Traill	N.D. AES	9-18	107	101	108	102	99	0.0	Rps1	3.3
Agassiz	Minn. AES	9-20	94	94	104	103	101	0.0	Rps1	3.3
X3103	Gold Country	9-20	-	-	96	97	102	0.2	S	4.1
Bygland	Gold Country	9-21	-	-	103	101	101	0.3	Rps1	3.1
Walsh	N.D. AES	9-22	-	-	105	100	101	0.2	Rps6	3.7
90B43	Pioneer	9-23	114	112	106	97	104	0.4	Rps1c	3.4
MN0301	Minn. AES	9-23	106	107	102	97	103	0.3	Rps1	3.3
Barnes	N.D. AES	9-23	-	-	96	98	104	0.4	Rps6	3.4
MN0302	Minn. AES	9-24	-	106	96	102	99	0.3	Rps1k	3.2
MN0201	Minn. AES	9-24	-	105	93	108	95	0.2	Rps1	2.9
2030	Thunder	9-24	-	-	92	101	98	0.3	S	3.7
398	Thunder	9-25	-	-	99	102	97	0.3	S	3.6
M-0512	Mustang	9-26	-	-	98	102	99	0.5	S	3.4
Council	N.D. AES	9-26	109	105	98	98	100	0.5	S	3.1
6038	Top Farm	9-27	-	113	109	99	100	0.3	Rps1c	4.0
Cass	Hyland	9-27	-	-	105	101	98	0.4	Rps1k	3.7
DSR-061	Dairyland	9-27	-	-	102	99	102	0.6	Rps1k	4.1
Lambert	Minn. AES	9-27	108	106	98	100	99	0.7	Rps1	4.3
DST0810	Dairyland	9-28	-	-	112	97	103	0.7	S	3.6
M-0700	Mustang	9-28	104	107	102	100	102	0.5	S	3.7
Mean			41.7 bu/a	39.3 bu/a	43.0 bu/a	35.0 %	19.0 %			
LSD 20%			2	3	5					

Performance and characteristics of public and private soybean varieties, central zone; Becker, Morris and Rosemount 1999-2001.

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
90B43	Pioneer	9-6	94	92	95	93	108	0.4	Rps1c	3.3
2105	Thunder	9-7	-	-	89	101	100	0.5	Rps1k	3.5
Barnes	N.D. AES	9-9	-	87	85	98	109	0.4	Rps6	3.4
MN0301	Minn. AES	9-10	84	88	84	100	104	0.3	Rps1	3.3
MN0302	Minn. AES	9-11	-	-	84	101	102	0.3	Rps1k	3.2

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
3-3163	Thompson	9-13	-	-	101	101	101	1.5	Rps1k	3.3
Large	Minn. & S.D. AES	9-14	102	105	107	101	102	1.0	Rps1	3.4
06	Northstar	9-14	-	-	95	100	99	0.4	S	4.2
0108P70	Agripro/Garst	9-15	-	-	98	97	103	0.8	Rps1k	3.4
1B01	Pioneer	9-15	98	99	95	97	104	1.0	Rps1k	3.5
ambert	Minn. AES	9-15	95	97	95	99	101	0.7	Rps1	4.3
MN0901	Minn. AES	9-15	95	95	87	98	103	0.9	Rps1	4.3
ato	Minn. AES	9-15	90	94	83	107	95	1.4	Rps1	3.2
JSS131	United Suppliers	9-16	-	-	102	99	100	1.5	S	3.5
MN1302	Minn. AES	9-17	-	-	101	94	103	1.3	Rps1k	3.2
X 0127	Sands	9-17	-	-	100	99	100	1.4	Rps1k	3.5
077	Topfarm	9-17	97	99	90	96	103	0.7	Rps1c	3.4
01011	Topfarm	9-18	-	-	107	94	102	1.1	Rps1c	2.8
0-0707	KSC/Challenger	9-18	-	-	106	99	104	0.7	S	2.8
0DV1010	Advantage	9-18	-	-	94	100	100	1.0	Rps1k	3.6
MN0902CN	Minn. AES	9-18	89	91	87	100	99	0.9	S	3.7
033	Northstar	9-19	105	110	109	101	98	0.9	S	3.3
209	Thunder	9-19	-	-	108	99	100	0.9	S	3.8
0B-1221	Prairie Brand	9-19	-	105	106	99	102	1.2	Rps1k	3.9
JSE131	US Seeds	9-19	-	-	97	98	102	1.3	S	3.2
argent	N.D. AES	9-19	-	-	89	98	101	1.3	Rps6	3.4
M-1138	Mustang	9-20	110	113	112	101	99	1.3	S	3.6
M1B53	Pioneer	9-20	108	108	105	102	97	1.6	S	3.7
MN1301	Minn. AES	9-20	95	97	95	102	101	1.3	Rps1	3.3
MN1401	Minn. AES	9-20	94	96	89	102	99	1.4	Rps1	3.2
545	Farm Advantage	9-21	-	-	102	103	97	1.4	S	3.3
0-1333	Kruger	9-21	108	107	102	101	98	1.3	S	4.2
0BR-174	PBR	9-21	-	108	101	104	97	1.7	S	3.9
0arker	Minn. AES	9-22	108	111	111	99	102	1.5	Rps1	4.7
0S1600	Profiseed	9-22	-	114	110	103	97	1.5	S	3.0
0B-146	Prairie Brand	9-22	109	110	105	100	99	1.5	S	3.5
M-1172	Mustang	9-22	-	109	103	101	98	1.7	S	3.5
140 Brand	Latham	9-22	109	110	103	103	97	1.4	S	3.4
reeborn	Minn. AES	9-22	96	98	95	104	98	1.6	Rps1	3.8
0-1888	Yield King	9-22	-	-	94	99	99	1.6	Rps1k	3.5
0-1313	KSC/Challenger	9-23	-	-	119	100	97	1.3	S	4.5
0BR 172	PBR	9-23	-	-	116	100	97	1.7	S	3.9
0OI 144	Sands	9-23	115	116	114	103	96	1.4	S	3.9
0-1808	Kruger	9-24	-	-	115	97	101	1.6	S	3.3
0B-178	Prairie Brand	9-24	-	-	112	103	99	1.7	S	3.4
0SR-160	Dairyland	9-25	-	-	93	102	96	1.6	S	3.7
0-1919	Kruger	9-26	-	118	116	101	99	1.7	S	3.7
0-1909	Yield King	9-26	-	-	110	96	98	1.7	S	3.3
0SR-183	Dairyland	9-26	-	-	102	102	98	1.8	S	3.8
0-1818	KSC/Challenger	9-27	-	-	89	102	99	1.6	S	3.5
M-1182	Mustang	9-29	-	-	101	106	92	1.8	S	3.8
0-1809	KSC/Challenger	9-29	-	-	97	100	96	1.6	Rps1	4.1
Mean			55.5 bu/acre	50.7 bu/acre	46.0 bu/acre	35.0%	19.0%			
SD 20%			2	2	4					

**Performance and characteristics of public and private soybean varieties, southern zone;
Waseca, Lamberton and Fairmont 1999-2001.**

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
MN1301	Minn. AES	9-21	92	—	89	105	102	1.3	Rps1	3.3
MN1401	Minn. AES	9-22	91	90	90	102	103	1.4	Rps1	3.2
MN1302	Minn. AES	9-23	—	—	90	98	102	1.3	Rps1k	3.2
91B92	Pioneer	9-25	—	—	95	97	107	1.9	Rps1k	4.4
Parker	Minn. AES	9-26	100	101	100	100	102	1.5	Rps1	4.7
Freeborn	Minn. AES	9-26	92	90	95	103	99	1.6	Rps1	3.8
MN1801	Minn. AES	9-27	101	92	99	101	101	1.8	Rps1c	3.8
91B53	Pioneer	9-27	101	95	92	102	101	1.6	S	3.8
EXP 7217-114	Sands	9-28	—	—	110	97	104	1.8	Rps1	4.0
6161	Top Farm	9-28	—	100	97	102	100	1.7	Rps1c	3.7
Sturdy	Minn. AES	9-28	90	89	89	104	99	2.0	Rps1	3.7
PBR 172	PBR	9-29	—	—	105	99	101	1.7	S	3.2
1922N	Farm Advantage	9-29	—	—	94	100	101	1.9	Rps1k	3.9
K-1888	KSC/Challenger	9-29	—	—	94	99	102	1.7	Rps1k	4.3
K-1909	Kruger	9-30	—	—	108	94	102	1.8	S	3.4
SOI 202	Sands	9-30	—	—	100	96	102	2.0	S	3.9
6197	Top Farm	9-30	—	97	96	99	101	1.9	S	3.6
D208	Garst	9-30	—	—	94	101	99	2.0	Rps1c	3.5
PB-178	Prairie Brand	10-1	—	—	107	99	102	1.7	S	3.9
H-1771	Golden Harvest	10-1	—	—	103	101	98	1.7	S	4.8
IA2021	Iowa AES	10-1	100	98	103	95	102	2.1	Rps1k	4.3
2077	Viking	10-1	—	—	102	102	101	1.9	S	3.6
K-1919	Kruger	10-1	—	103	102	101	101	1.7	S	3.5
Clements	Gold Country	10-1	—	104	101	103	97	2.1	S	3.9
T-3231	Thompson	10-1	—	102	101	102	101	2.3	Rps1	4.5
PB-194	Prairie Brand	10-1	101	100	100	101	101	1.9	S	4.0
USS199	US Seeds	10-1	—	97	95	102	98	1.9	S	3.5
T-3222	Thompson	10-2	107	106	108	100	100	2.2	S	3.9
PS 2209	Profiseed	10-2	—	—	108	99	101	2.2	S	4.1
K-1809	KSC/Challenger	10-2	—	—	104	94	103	1.6	Rps1	4.5
IA2050	Iowa AES	10-2	—	105	103	100	101	2.1	S	4.0
2002	Northstar	10-2	105	105	102	101	96	1.9	S	3.9
PS 2035	Profiseed	10-2	—	—	102	102	99	1.9	S	4.5
EXP 7331	Sands	10-2	—	—	101	101	102	2.4	Rps1	4.1
SOI 169	Sands	10-2	104	102	100	101	98	2.0	S	3.6
T-3201	Thompson	10-2	—	102	100	97	101	2.0	S	4.0
PB-217	Prairie Brand	10-2	103	100	100	100	101	2.1	S	4.1
PBR-202	PBR	10-2	104	102	98	100	99	2.0	S	3.8
K-2333	Yield King	10-2	—	—	96	95	102	2.1	S	4.6
IA1006	Iowa AES	10-2	97	97	93	97	101	1.6	S	3.8
2199	Viking	10-3	107	106	110	102	96	2.1	S	3.6
K-1818	KSC/Challenger	10-3	—	—	106	101	101	1.6	S	4.4
USS250	US Seeds	10-3	—	—	105	100	102	2.4	S	3.8
H-2052	Golden Harvest	10-3	—	—	105	103	94	2.0	S	3.3
392Brand	Latham	10-3	—	105	104	103	96	1.9	S	4.1
K-2325+	Kruger	10-3	—	106	104	100	100	2.2	S	4.3
M-2218	Mustang	10-3	104	104	103	102	97	2.1	S	4.4
230	Trelay	10-3	—	—	103	100	97	2.3	S	3.6
570 Brand	Latham	10-3	—	106	103	100	100	2.2	S	3.7
A2553	Asgrow	10-3	—	—	103	101	99	2.5	Rps1k	4.2

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
-2525+	Yield King	10-3	--	--	103	101	98	2.3	S	3.4
0120Y72	Agripro/Garst	10-3	--	--	102	101	101	2.1	S	3.8
-2313	Kruger	10-3	--	--	101	100	97	2.1	Rps1	4.1
B-230	Prairie Brand	10-3	--	101	97	99	99	2.3	Rps1	4.1
2008R	Iowa AES	10-3	100	98	97	99	97	2.1	Rps1k	3.5
1-2251	Mustang	10-4	--	102	102	99	101	2.5	S	3.9
90 Brand	Latham	10-4	--	--	102	99	103	2.4	S	4.4
-2343A	KSC/Challenger	10-4	--	--	102	101	95	2.1	S	4.5
2052	Iowa AES	10-4	--	97	95	101	99	2.3	Rps1	4.0
1-2252	Mustang	10-5	--	--	92	101	94	2.5	S	3.8
KB23-73	Dekalb	10-6	--	--	86	101	97	2.3	S	4.8
Mean			53.9 bu/acre	55.8 bu/acre	60.9 bu/acre	34.0%	18.7%			
SD 20%			4	4	5					

Performance and characteristics of very early maturing soybean varieties, 1997-2001.

Variety	Maturity Rating	Yield, Percent of Mean				Percent of Mean		Phytophthora Gene	Chlorosis Score
		Grand Rapids	Roseau	Kennedy	Average	Protein	Oil		
1cCall	00.7	99	96	96	97	99	101	S	4.2
im	00.8	115	115	109	113	99	100	S	4.0
gassiz	0.0	98	92	96	95	101	100	Rps1	4.2
raill	0.0	88	97	99	94	102	98	S	3.9
Mean		25.3 bu/acre	26.8 bu/acre	30.2 bu/acre	27.1 bu/acre	35.6%	17.0%		
SD 20%		4	6	9	7				

Performance and characteristics of public soybean varieties, southeastern Minn., 1997-2001.

Variety	Maturity Rating	Percent of Mean			Phytophthora Gene	Chlorosis Score
		Yield	Protein	Oil		
ambert	0.8	93	100	105	Rps1	3.6
1N1301	1.3	94	100	101	Rps1c	3.3
ato	1.3	95	106	97	Rps1	3.2
arker	1.5	101	99	101	Rps1	3.7
reeborn	1.6	99	102	97	Rps1	3.3
1900	1.9	100	94	106	Rps1k	4.2
turdy	2.0	106	102	95	Rps1	3.7
21006	1.6	107	99	99	S	3.8
2021	2.1	103	98	102	Rps1k	4.2
Mean		40.3 bu/acre	36.0%	17.2%		
SD 20%		5				

Performance and characteristics of Roundup Ready soybean varieties, northern zone; Brookston and Shelly 1999-2001.

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
BX 0081RR	Sansgaard	9-17	--	--	102	104	101	00.8	Rps1c	4.2
BX 0071RR	Sansgaard	9-19	--	--	91	99	99	00.7	S	4.3
1/2025RR	Wensman	9-19	--	--	89	100	103	0.2	Rps1c	3.9
0B11	Pioneer	9-20	--	--	110	100	100	0.1	S	4.6
300-4	Stine	9-21	--	--	102	101	103	0.3	S	4.0

**Performance and characteristics of Roundup Ready soybean varieties, northern zone;
Crookston and Shelly 1999-2001 (continued).**

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
RR Rally	Hyland	9-22	-	-	100	104	98	0.7	Rps1k	3.4
DKB03-51	Dekalb	9-23	-	102	114	100	104	0.3	Rps1	4.8
0090-4	Stine	9-23	-	-	96	102	100	0.1	S	4.2
PB-0121RR	Prairie Brand	9-23	-	-	80	97	102	0.1	S	4.5
R200RR	Ramy	9-24	-	97	101	99	105	0.2	S	4.3
W2054RR	Wensman	9-26	-	-	106	100	101	0.5	Rps1k	3.6
0205RR	Northstar	9-26	-	96	96	100	102	0.2	S	4.0
2200RR	Thunder	9-26	-	-	95	101	101	0.1	S	4.5
R0755RR	Ramy	9-26	-	-	89	100	101	0.7	S	4.0
PBX 0201RR	Sansgaard	9-26	-	-	67	97	104	0.2	S	3.8
DKB06-51	Dekalb	9-27	-	103	111	101	98	0.6	Rps1k	4.4
K-080-1RR	KSC/Challenger	9-27	-	-	111	100	100	0.6	Rps1	3.5
6059RR	Top Farm	9-27	101	96	98	98	101	0.3	S	4.4
PB-0601RR	Prairie Brand	9-27	-	-	95	99	100	0.6	S	4.2
RR Rugged	Hyland	9-27	99	93	93	100	100	0.3	S	4.2
PBR 0091RR	PBR	9-27	-	-	86	100	100	0.9	S	4.3
M-021RR	Mustang	9-27	-	-	70	98	104	0.2	S	3.9
2020RR	Seeds2000	9-28	-	-	75	98	102	0.2	S	4.7
M-051RR	Mustang	9-29	-	-	122	100	101	0.5	S	3.8
K-077-1RR	Kruger	9-29	-	105	110	101	98	0.5	Rps1k	3.6
0700-4	Stine	9-29	-	104	109	105	99	0.7	S	4.0
K-051RR	KSC/Challenger	9-29	-	-	109	100	97	0.3	Rps1k	4.0
M-052RR	Mustang	9-29	-	-	108	100	97	0.5	Rps1k	4.4
X-0040RR	Dahco	9-29	-	-	107	100	99	0.3	S	4.3
PB-0810RR	Prairie Brand	9-29	-	102	107	98	99	0.8	Rps1k	4.3
DSR-030/RR	Dairyland	9-29	-	-	106	104	97	0.3	Rps1c	4.0
W2050RR	Wensman	9-29	-	101	105	102	96	0.5	Rps1k	4.3
0026RR	Northstar	9-29	-	-	103	98	101	0.0	S	4.2
M-079RR	Mustang	9-29	98	103	101	98	100	0.7	Rps1k	4.5
2203RR	Thunder	9-29	-	-	93	98	104	0.3	Rps1k	3.8
0506RR	Northstar	9-30	-	-	125	100	102	0.5	S	4.8
K-077RR	Kruger	9-30	-	110	125	102	97	0.5	S	4.5
PBX 0621RR	Sansgaard	9-30	-	-	120	96	104	0.6	S	4.4
PBR 0561RR	PBR	9-30	-	-	109	100	99	0.5	S	4.2
W2039RR	Wensman	9-30	101	96	96	93	106	0.3	S	4.3
RR Richland	Hyland	9-30	-	-	92	103	95	0.8	Rps1k	3.9
6020RR	Top Farm	9-30	-	95	82	98	104	0.2	S	4.4
K-090RR	Kruger	10-1	-	-	109	101	94	0.7	Rps1c	3.5
K-091-1RR	KSC/Challenger	10-1	-	-	108	98	100	0.6	S	4.0
PBR 0020RR	PBR	10-1	-	-	98	100	97	0.9	S	4.4
K-050RR	KSC/Challenger	10-2	-	-	94	99	100	0.3	S	4.5
PBR 0041RR	PBR	10-3	-	-	94	100	96	0.9	Rps1k	3.8
DST 1114RR	Dairyland	10-4	-	-	94	96	98	0.7	S	3.7
PB-0321RR	Prairie Brand	10-5	-	-	79	101	103	0.3	Rps1k	3.3
Mean			39.5 bu/acre	37.0 bu/acre	32.9 bu/acre	14.5%	18.8%			
LSD 20%			5	5	9					

Performance and characteristics of Roundup Ready soybean varieties, central zone; semount and Morris 1999-2001.

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
8RR	Gold Country	9-12	-	-	83	98	100	0.8	Rps1k	3.9
7ally	Hyland Seed	9-12	-	82	83	100	102	0.7	Rps1k	3.5
71RR	Renk	9-12	-	-	78	99	103	0.7	Rps1k	3.1
0810RR	Prairie Brand	9-13	-	-	95	101	101	0.8	Rps1k	4.4
080RR	Dahlco	9-13	-	-	85	103	100	0.8	Rps1k	3.1
5RR	Northstar	9-13	-	-	82	99	98	0.8	S	3.8
306-51	Dekalb	9-14	-	89	93	101	97	0.6	Rps1k	4.4
8RR	Thunder	9-14	-	-	91	98	103	0.8	Rps1k	3.8
X0512	Mallard	9-14	-	-	88	98	101	0.5	Rps1k	4.1
801	Asgrow	9-15	97	96	104	99	103	0.8	Rps1k	3.7
0880R	Advantage	9-15	-	-	95	101	101	0.8	Rps1k	3.8
945	Midwest Seed	9-15	-	-	87	106	98	0.9	Rps1	3.9
097RR	Latham	9-15	-	-	85	98	103	0.9	Rps1k	3.7
0820RR	Sands	9-15	-	-	83	98	101	0.8	Rps1k	3.3
3-R4	NK Brand	9-16	-	-	97	100	95	0.8	Rps1k	4.0
105P01	Agripro/Garst	9-16	-	-	95	103	99	0.5	Rps1k	3.4
979RR	Golden Harvest	9-16	93	90	90	105	99	0.9	S	4.4
9RR	Thunder	9-17	-	-	102	102	100	0.9	Rps1	2.9
93RR	Mustang	9-17	-	-	100	100	102	0.9	Rps1	3.8
106R	Ziller	9-17	-	93	96	98	98	1.0	Rps1c	3.7
5RR	Northstar	9-17	-	-	93	99	103	0.9	S	3.7
51RR	Top Farm	9-17	-	-	89	97	104	0.5	Rps1k	4.5
091RR	Sodak Genetics	9-18	-	-	112	101	105	0.9	Rps1	4.2
52	Pioneer	9-18	103	100	109	97	107	1.5	Rps1k	4.0
1030RR	Prairie Brand	9-18	-	-	104	102	98	1.0	Rps1c	4.1
95	Ramy	9-18	-	-	102	98	105	0.9	Rps1	3.7
40302R	Ziller	9-18	-	-	101	102	101	1.0	Rps1	3.6
X0912	Mallard	9-18	-	-	96	98	103	0.9	Rps1	3.5
91-A RR	Top Farm	9-18	-	-	96	102	99	0.9	Rps1	4.0
7-4	Stine	9-18	-	-	95	99	104	1.0	S	4.7
5RR	Jung	9-18	-	-	95	101	101	0.9	Rps1k	3.9
81RR	Thompson	9-18	-	-	90	100	102	0.8	Rps1	3.8
12	Pioneer	9-18	-	-	87	99	103	1.1	S	4.5
Richland	Hyland Seed	9-18	-	-	84	102	100	0.8	Rps1k	3.7
1200RR	Sands	9-19	-	106	111	96	101	1.2	Rps1k	4.4
1011	Mallard	9-19	-	101	100	96	105	1.0	Rps1c	3.9
93RR	LG Seeds	9-19	-	-	99	97	108	0.9	S	4.6
6RR	Northstar	9-19	-	-	94	97	102	1.0	S	3.5
310-51	Dekalb	9-19	-	89	88	100	100	1.0	Rps1c	4.3
101R	Ziller	9-19	-	85	87	102	100	1.0	S	4.4
0RR	Gold Country	9-19	-	-	85	101	97	1.0	Rps1k	4.1
4RR	Northstar	9-19	-	-	83	99	103	0.9	S	4.6
30909RR	US Seeds	9-20	-	94	105	99	104	0.9	S	4.5
3-101/RR	Dairyland	9-20	-	-	99	102	103	1.1	S	3.7
1-T1	NK Brand	9-20	-	-	98	99	98	1.0	Rps1k	4.3
6-4	Stine	9-20	-	-	93	99	103	0.9	S	3.8
01RR	Renk	9-20	-	-	91	99	98	1.0	Rps1c	4.2
114Y06	Agripro/Garst	9-21	-	-	103	99	103	1.4	S	3.9
2RR	High Cycle	9-21	-	-	101	99	101	1.0	Rps1c	3.8
1301	Asgrow	9-21	105	101	100	97	103	1.3	Rps1	4.2

**Performance and characteristics of Roundup Ready soybean varieties, central zone;
Rosemount and Morris 1999-2001 (continued).**

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
XR0111PO4	Agripro/Garst	9-21	--	--	98	102	96	1.1	Rps1k	3.5
2007RR	Dahlman	9-21	--	--	98	102	98	0.7	S	3.7
USE1002RR	US Seeds	9-21	--	--	96	97	102	1.0	Rps1c	4.1
XR0109Y03	Agripro/Garst	9-21	--	--	96	102	97	0.9	S	3.9
W2100RR	Wensman	9-21	--	92	88	96	102	1.1	Rps1c	4.2
C1432RR	LG Seeds	9-21	--	100	88	94	107	1.4	Rps1k	3.9
1501RR	Agripro/Garst	9-22	--	--	107	97	98	1.5	S	4.0
2110RR	Seeds2000	9-22	--	--	104	99	102	1.1	Rps1k	3.7
RS141RR	Renk	9-22	--	--	104	95	105	1.4	Rps1k	4.2
R-1505	Ramy	9-22	--	--	104	98	101	1.5	Rps1k	4.0
9145RR	Dahlco	9-22	--	98	103	99	102	1.4	S	3.9
91B33	Pioneer	9-22	--	--	99	98	106	1.3	Rps1k	4.3
K-121 RR	Kruger	9-22	--	--	96	104	97	1.0	S	3.9
SOI 140RR	Sands	9-22	--	--	93	97	104	1.4	Rps1k	3.1
SOI 174RR	Sands	9-23	--	--	120	97	99	1.5	Rps1c	4.1
USS1501RR	US Seeds	9-23	--	--	117	103	97	1.5	S	3.7
2152RR	High Cycle	9-23	--	114	115	92	105	1.5	Rps1c	4.2
RS159RR	Renk	9-23	115	116	115	95	101	1.5	Rps1c	3.3
DKB16-51	Dekalb	9-23	--	103	110	102	95	1.6	S	3.9
M-151RR	Mustang	9-23	111	111	109	92	102	1.5	Rps1c	3.9
2213RR	Gold Country	9-23	--	--	109	104	98	1.3	S	4.0
1508RR	Anderson	9-23	--	--	109	103	96	1.5	S	4.0
K-149 RR	KSC/Challenger	9-23	--	--	108	96	101	1.3	Rps1c	4.1
PBR 1620RR	PBR	9-23	--	--	108	98	101	1.7	Rps1c	4.0
BT7150R	Ziller	9-23	--	111	106	98	101	1.5	Rps1c	3.5
W2153RR	Wensman	9-23	--	--	105	101	99	1.5	S	3.7
M-132RR	Mustang	9-23	--	--	105	104	102	1.3	S	4.4
7153	Farm Advantage	9-23	--	--	105	105	97	1.5	S	4.1
GR1545	Midwest Seed	9-23	--	--	103	106	92	1.5	S	4.0
AG1602	Asgrow	9-23	--	103	103	99	100	1.6	Rps1k	3.9
1702RR	Agripro/Garst	9-23	--	--	102	97	99	1.5	Rps1c	4.1
2210RR	Thunder	9-23	--	--	99	103	103	1.0	S	3.8
8137RR	Jung	9-23	--	104	99	109	97	1.3	S	3.9
PBR 0941RR	PBR	9-23	--	--	96	102	97	0.9	Rps1k	3.6
H-1565RR-1	Golden Harvest	9-24	--	--	118	95	101	1.5	Rps1c	3.9
PB-1540RR	Prairie Brand	9-24	--	108	117	102	98	1.5	S	4.3
8151RR	Jung	9-24	--	--	116	105	94	1.5	S	3.5
W2160RR	Wensman	9-24	--	106	113	92	104	1.6	Rps1c	4.0
M-152RR	Mustang	9-24	--	106	111	102	98	1.5	S	3.8
RR X1312	Mallard	9-24	--	--	109	101	99	1.3	S	3.9
DSR-130/RR	Dairyland	9-24	--	102	107	96	101	1.3	S	3.7
PB-1246RR	Prairie Brand	9-24	--	104	105	105	99	1.3	S	4.6
1303-4	Stine	9-24	--	--	103	100	101	1.4	Rps1k	4.5
W2131	Wensman	9-24	--	--	102	100	103	1.3	Rps1k	3.8
K-166 RR	Kruger	9-24	--	--	102	94	102	1.4	Rps1c	4.4
K-133 RR	KSC/Challenger	9-24	--	--	102	105	98	1.3	S	4.3
6016RR	Gold Country	9-24	--	--	101	95	99	1.5	Rps1c	3.9
PBX 1241RR	Sansgaard	9-24	--	--	96	101	101	1.2	Rps1k	4.2
909RR	Dahlman	9-24	--	--	91	97	102	0.9	Rps1k	4.4
S14-G3	NK Brand	9-24	--	--	88	100	98	1.4	Rps1k	4.5

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
22 RR	KSC/Challenger	9-25	--	--	107	100	98	1.0	S	3.9
16-4	Stine	9-25	--	100	105	102	100	1.5	S	3.9
19RR	Top Farm	9-25	--	97	103	99	98	1.4	Rps1k	3.8
18RR	Jung	9-25	--	--	97	100	98	1.3	S	3.4
155RR	Thompson	9-25	--	--	96	102	99	1.4	S	4.0
131RR	Dahlco	9-25	--	--	95	102	96	1.3	S	3.8
99 RR/STS	KSC/Challenger	9-26	--	--	119	96	103	1.7	S	4.0
51-1 RR	Yield King	9-26	--	--	113	106	95	1.3	Rps1k	3.8
15RR	Dahlman	9-26	--	--	111	100	101	1.5	S	3.8
61 RR	Kruger	9-26	--	--	109	102	103	1.4	Rps1k	3.8
148RR	Thompson	9-26	--	--	106	104	96	1.3	Rps1k	4.4
X 1521RR	Sansgaard	9-26	--	--	106	105	97	1.5	Rps1k	4.5
R-151/RR	Dairyland	9-26	--	--	101	98	98	1.5	S	4.0
7RR Brand	Latham	9-26	--	--	97	100	99	1.5	S	3.2
1152	Profitseed	9-26	--	--	95	102	94	1.5	S	4.2
16-4	Stine	9-26	--	--	94	102	98	1.4	S	4.0
51 RR	Yield King	9-27	--	--	114	101	101	1.3	S	4.3
X 1561RR	Sansgaard	9-27	--	--	108	85	96	1.5	S	4.0
15RR	Dahlman	9-27	--	--	103	106	94	1.5	Rps1k	4.4
R 1821RR	PBR	9-28	--	--	104	100	103	1.8	S	4.0
102-1 RR	Yield King	9-28	--	--	92	100	101	1.8	S	4.0
121+RR	Yield King	9-29	--	--	95	100	101	1.9	Rps1k	3.6
1051RR	Dahlco	9-30	--	--	90	99	103	0.5	S	4.2
X 1701RR	Sansgaard	10-1	--	--	118	102	99	1.7	Rps1k	4.3
R-181/RR	Dairyland	10-1	--	--	117	96	105	1.8	S	3.7
R 1981RR	PBR	10-2	--	--	114	100	101	1.9	S	3.9
81 RR	Kruger	10-4	--	--	103	98	103	1.6	Rps1k	4.2
Mean			48.0 bu/acre	46.0 bu/acre	33.9 bu/acre	33.95%	18.35%			
SD 20%			2	4	6					

Performance and characteristics of Roundup Ready soybean varieties, southern zone; Humberton and Waseca 1999-2001.

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
221RR	Renk	9-28	--	--	89	96	102	2.2	Rps1k	3.7
1602	Asgrow	9-29	--	--	104	93	102	1.5	Rps1k	3.8
55RR	Jung	9-29	--	--	99	101	97	1.5	S	4.6
505	Ramy	9-29	--	--	90	100	102	1.5	Rps1k	3.2
133RR	KSC/Challenger	9-30	--	--	106	104	99	1.3	S	3.8
102RR	Agripro	9-30	--	--	105	95	99	1.5	Rps1c	3.7
1501RR	Great Lakes	9-30	99	99	102	101	98	1.5	Rps1c	3.7
364	Pioneer	9-30	101	98	102	96	102	1.6	Rps1c	4.0
1511	Mallard	9-30	--	--	100	102	97	1.5	S	4.3
R 1620RR	PBR	9-30	--	--	100	100	104	1.7	Rps1c	3.5
1565RR	Golden Harvest	9-30	100	103	100	98	99	1.5	Rps1c	3.7
160RR	Wensman	9-30	--	107	96	91	101	1.6	Rps1c	3.7
391	Pioneer	9-30	94	94	91	97	103	1.7	S	3.9
710R	Midwest Seed	10-1	--	--	113	93	102	1.7	Rps1c	3.4
30RR	Dahlco	10-1	--	104	107	99	99	1.6	Rps1c	3.8

**Performance and characteristics of Roundup Ready soybean varieties, southern zone;
Lamberton and Waseca 1999-2001 (continued).**

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
K-149RR	KSC/Challenger	10-1	-	-	106	97	104	1.3	Rps1c	3.3
92B05	Pioneer	10-1	103	102	103	97	101	1.9	Rps1k	4.7
DKB16-51	Dekalb	10-1	-	-	101	102	96	1.6	S	3.8
2015RR	Dahlman	10-1	-	-	98	99	95	1.5	S	4.0
XR0118B07	Agripro/Garst	10-1	-	-	97	102	97	1.8	S	3.7
BT7150R	Ziller	10-1	-	99	94	93	101	1.5	Rps1c	3.5
RS199RR	Renk	10-2	-	-	104	94	103	1.9	Rps1k	4.2
AG2001	Asgrow	10-2	-	-	99	100	103	2.0	Rps1k	4.1
2115RR	Dahlman	10-2	-	-	95	100	99	1.5	Rps1k	4.0
ADV1951R	Advantage	10-2	-	-	95	98	105	1.9	Rps1k	4.5
GL2109RR	Great Lakes	10-3	-	-	101	102	101	2.1	Rps1c	4.2
S19-V2	NK Brand	10-3	-	-	101	96	99	1.9	Rps1	4.0
DG3193RR	Dyna-Gro	10-3	-	-	98	101	96	1.9	Rps1k	3.8
217RR Brand	Latham	10-3	-	100	97	105	147	1.8	Rps1k	3.4
917RR	Dahlman	10-3	98	94	97	99	99	1.7	S	4.1
2211RR	High Cycle	10-3	-	-	95	102	99	2.1	S	3.4
1822RR	Anderson	10-3	-	98	94	97	97	1.8	Rps1k	3.9
C1828RR	LG Seeds	10-3	-	-	93	99	106	1.8	Rps1k	3.7
547RR Brand	Latham	10-3	-	-	93	103	104	2.2	Rps1c	4.6
C1821R	Crows	10-3	-	-	92	97	98	1.8	Rps1k	3.7
DKB19-51	Dekalb	10-3	-	-	89	99	100	1.9	Rps1k	3.4
C24009RN	Crows	10-3	-	91	86	99	101	2.3	S	4.0
2000RR	Viking	10-4	107	106	108	101	98	2.0	S	3.8
E1701RR	Top Farm	10-4	-	-	108	106	102	1.7	Rps1k	3.7
1719RR	Anderson	10-4	-	-	107	103	97	1.7	Rps1k	4.6
DST-2129/RR	Dairyland	10-4	-	-	106	99	94	2.0	S	3.7
8176RR	Jung	10-4	-	-	106	101	96	1.7	Rps1k	4.0
1613-4	Stine	10-4	-	-	105	103	98	1.8	Rps1k	4.0
K-161RR	Kruger	10-4	-	-	105	100	99	1.4	Rps1k	4.4
PBX 1941RR	Sansgaard	10-4	-	-	104	99	102	1.9	S	3.9
0200RR	Dahlco	10-4	-	-	103	104	97	2.0	S	3.5
PBR 1821RR	PBR	10-4	-	-	103	94	103	1.8	S	3.8
417RR Brand	Latham	10-4	-	-	101	105	99	2.0	S	4.0
E1971RR	Top Farm	10-4	-	100	101	103	99	1.9	S	3.9
GL1903RR	Great Lakes	10-4	-	-	100	104	98	1.9	S	3.9
GL1709RR	Great Lakes	10-4	-	-	99	101	101	1.7	S	3.5
2103-4	Stine	10-4	-	-	99	99	96	2.1	Rps1k	3.3
PS4172	Profiseed	10-4	-	-	99	101	101	1.7	Rps1k	3.8
PB-1721RR	Prairie Brand	10-4	-	-	98	98	99	1.7	Rps1k	4.5
AG2102	Asgrow	10-4	-	97	96	99	99	2.1	Rps1k	3.5
2018RR	Dahlman	10-4	-	-	96	94	103	1.8	S	4.0
RR1912	Mallard	10-4	-	-	95	95	98	1.9	Rps1k	3.8
BT7191R	Ziller	10-4	-	97	94	101	98	1.9	S	4.0
DG3231NRR	Dyna-Gro	10-4	-	-	93	100	102	2.3	S	4.0
1944CNRR	Viking	10-4	-	-	92	99	106	1.9	S	4.0
DKB20-51	Dekalb	10-4	-	-	88	101	99	2.0	S	3.3
X-0171RR	Dahlco	10-4	-	-	88	101	101	1.7	S	4.0
H-2348RR	Golden Harvest	10-4	-	-	86	99	103	2.3	S	3.9
K-221RR	Kruger	10-5	-	106	113	99	97	2.0	Rps1k	3.4
DSR-221/RR	Dairyland	10-5	-	-	110	105	96	2.2	S	4.1

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
8200RR	Jung	10-5	-	-	109	105	97	2.0	S	3.5
92B38	Pioneer	10-5	-	-	109	104	98	2.3	S	4.2
PBR 2141RR	PBR	10-5	-	-	109	100	101	2.1	Rps1k	4.0
R2005	Ramy	10-5	-	-	108	99	98	2.0	S	4.1
S24-K4	NK Brand	10-5	-	109	106	99	107	2.2	Rps1	4.2
AG2302	Asgrow	10-5	-	108	106	99	98	2.3	Rps1k	3.5
1221RR	Gold Country	10-5	-	-	105	102	99	2.1	S	3.7
K-232-2RR	Kruger	10-5	-	-	105	103	98	2.1	S	3.9
T-3176RR	Thompson	10-5	-	-	105	101	99	1.7	S	4.0
PS4192	Profiseed	10-5	-	-	104	100	101	1.9	S	3.9
DG3223RR	Dyna-Gro	10-5	-	-	104	100	99	2.2	S	4.2
EXP203	Farm Advantage	10-5	-	-	103	104	99	2.0	Rps1k	4.1
2136-4	Stine	10-5	-	-	102	97	103	2.2	Rps1k	4.1
2201RR	High Cycle	10-5	-	-	101	103	95	2.0	S	3.7
T-3217RR	Thompson	10-5	-	-	101	98	101	2.1	Rps1k	4.2
2063RR	Anderson	10-5	99	97	101	100	96	2.0	S	3.9
S20-25	NK Brand	10-5	-	100	100	94	99	2.0	Rps1	4.4
C1901R	Crows	10-5	-	-	99	98	98	1.9	S	3.8
EX467RR	Latham	10-5	-	99	98	102	101	2.1	S	3.5
SOI 2111RR	Sands	10-5	-	-	97	101	97	2.1	Rps1k	3.8
2547RR	Agripro/Garst	10-5	-	-	97	104	98	2.4	S	4.3
T-3213RR	Thompson	10-5	-	100	97	98	101	2.1	S	4.4
E2401RR	Top Farm	10-5	-	-	97	100	101	2.4	S	4.4
EXP 21921R	Ziller	10-5	-	-	96	101	100	2.0	S	3.9
AG2202	Asgrow	10-5	-	-	93	100	98	2.2	Rps1k	3.1
C2150RR	LG Seeds	10-5	-	-	92	102	107	2.1	Rps1k	4.1
USE1702RR	US Seeds	10-5	-	-	92	97	98	1.7	Rps1k	3.6
XR0121Y09	Agripro/Garst	10-5	-	-	91	103	96	2.1	S	4.3
K-221+RR	Yield King	10-6	-	-	110	103	105	1.9	Rps1k	3.3
K-212-2RR	Yield King	10-6	-	-	109	101	102	1.9	Rps1k	4.1
K-252-2RR	Kruger	10-6	-	-	108	103	102	2.2	Rps1k	3.7
M-211RR	Mustang	10-6	-	-	107	102	101	2.1	Rps1k	4.2
8226RR	Jung	10-6	-	101	107	100	98	2.2	S	3.4
6224RR	Gold Country	10-6	-	-	107	100	103	2.4	Rps1k	3.3
SOI 2110RR	Sands	10-6	-	-	107	99	97	2.1	Rps1	4.3
M-241RR	Mustang	10-6	-	-	106	101	97	2.4	S	4.3
DSR-228/RR	Dairyland	10-6	-	108	105	99	100	2.3	S	3.8
1122RR	Gold Country	10-6	-	103	105	98	100	2.2	S	3.6
PB-2131RR	Prairie Brand	10-6	-	-	105	98	95	2.1	Rps1k	4.6
ADV2155	Advantage	10-6	-	-	105	96	99	2.1	Rps1k	3.8
PS4211	Profiseed	10-6	-	-	105	104	103	2.1	S	3.8
W2194RR	Wensman	10-6	-	-	104	100	101	1.9	Rps1k	3.2
XR0123W32	Agripro/Garst	10-6	-	-	104	104	96	2.3	S	3.8
RR X211	Mallard	10-6	-	-	103	101	101	2.1	Rps1k	4.1
XR119P08	Agripro/Garst	10-6	-	-	103	90	116	1.9	Rps1k	3.9
2029RR	Viking	10-6	-	-	102	106	101	1.9	S	3.4
GR2132	Midwest Seed	10-6	-	-	102	102	100	2.1	Rps1k	3.8
BT7211R	Ziller	10-6	-	103	102	100	101	2.1	S	4.2
K-236RR	Yield King	10-6	-	-	102	101	99	2.2	S	3.6
PBR 1981RR	PBR	10-6	-	-	102	99	99	1.9	S	4.2

Performance and characteristics of Roundup Ready soybean varieties, southern zone; Lambertson and Waseca 1999-2001 (continued).

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean			Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1999-2001	2000-2001	2001	Protein	Oil			
PBX 2297RR	Sansgaard	10-6	-	-	102	103	103	2.2	S	4.3
C2118R	Crows	10-6	-	-	101	101	102	2.1	Rps1k	4.0
DKB23-51	Dekalb	10-6	-	98	101	99	99	2.3	Rps1	3.3
PBX 2117RR	Sansgaard	10-6	-	-	101	104	99	2.2	S	3.7
1918-4	Stine	10-6	-	-	100	100	101	2.4	Rps1k	3.5
RR 2312	Mallard	10-6	-	-	100	99	95	2.3	Rps1k	3.8
RS240RR	Renk	10-6	-	99	98	104	99	2.4	Rps1k	3.6
H-2304RR	Golden Harvest	10-6	-	100	98	97	97	2.3	S	4.5
DSR-241/RR	Dairyland	10-6	101	97	97	103	95	2.4	Rps1k	4.0
EXP215	Farm Advantage	10-6	-	-	97	104	99	2.1	Rps1k	3.8
PB-2397RR	Prairie Brand	10-6	98	98	97	99	103	2.3	S	4.3
2212RR	High Cycle	10-6	-	-	96	98	105	2.1	Rps1k	3.9
SOI 226RR	Sands	10-6	-	103	96	103	97	2.2	S	4.1
K-250RR	Yield King	10-6	-	102	96	100	101	2.3	S	3.8
T-3245RR	Thompson	10-6	-	-	96	100	98	2.4	S	4.5
2169RR	Anderson	10-6	-	-	96	101	98	2.1	Rps1k	4.3
W2215	Wensman	10-6	-	-	93	102	105	2.1	Rps1k	4.2
PBX 2261RR	Sansgaard	10-6	-	-	93	101	98	2.2	Rps1k	4.2
PS4212	Profiseed	10-6	-	-	92	97	101	2.1	Rps1k	4.0
M-201RR	Mustang	10-7	-	-	121	98	99	2.0	Rps1k	3.7
PB-2141RR	Prairie Brand	10-7	-	-	110	102	100	2.1	Rps1k	3.4
EXP212	Farm Advantage	10-7	-	-	109	101	102	2.1	S	4.1
USS2101RR	US Seeds	10-7	-	-	106	99	104	2.1	S	3.5
T-3205RR	Thompson	10-7	-	-	106	98	100	2.0	Rps1k	3.8
457RR Brand	Latham	10-7	-	-	103	104	102	2.3	S	4.5
AG2402	Asgrow	10-7	-	-	101	102	101	2.4	Rps1k	3.7
EX-397RR	Latham	10-7	-	-	100	103	98	2.1	Rps1k	3.6
DG3212RR	Dyna-Gro	10-7	-	-	99	95	99	2.1	S	3.6
W2240RR	Wensman	10-7	-	-	98	105	97	2.4	Rps1k	3.5
GR2485	Midwest Seed	10-7	-	-	96	98	99	2.4	Rps1k	3.8
M-230RR	Mustang	10-7	-	-	95	98	102	2.3	Rps1	4.2
K-255-5RR	KSC/Challenger	10-7	-	-	94	93	102	2.3	Rps1k	4.2
USE2402RR	US Seeds	10-8	-	-	102	105	99	2.4	Rps1k	3.8
E2431RR	Top Farm	10-8	-	-	97	100	98	2.4	Rps1k	4.6
SOI 2459RR	Sands	10-8	-	97	89	106	99	2.4	S	4.1
K-252+RR	KSC/Challenger	10-9	-	-	100	104	99	2.3	Rps1	4.0
Mean			57.1 bu/acre	54.4 bu/acre	59.9 bu/acre	34.4%	18.9%			
LSD 20%			3	4	5					

Performance and characteristics of soybean-cyst-nematode-infested (Lamberton, Madelia and Waseca) and non-infested (Fairmont, Lamberton, Potsdam and Waseca) sites, 1999-2001.

Variety	Brand or Originator	Maturity Date	Yield, Percent of Mean						Percent of Mean		Maturity Rating	Phytophthora Gene	Chlorosis Score	SCN Rating
			Infested Sites			Non-Infested Sites			Protein	Oil				
			99-01	00-01	2001	99-01	00-01	2001						
Freeborn	Minn. AES	9-29	101	96	102	95	91	94	100	101	1.6	Rps1	3.8	R
Parker	Minn. AES	9-29	92	88	91	104	100	107	99	104	1.5	Rps1	4.7	S
1802CN	Northstar	10-1	-	-	111	-	-	100	100	103	1.8	S	4.1	R
R-1815CNRR	Ramy	10-1	-	-	96	-	-	93	99	99	1.8	Rps1k	4.2	MR
IA1008	Iowa AES	10-2	98	95	108	101	99	100	98	100	2.0	S	4.3	MS
K-2220+SCN	Kruger	10-2	-	112	107	-	104	109	100	99	2.0	Rps1	3.4	MR
PBR 198N	PBR	10-2	-	-	102	-	-	102	98	101	1.9	Rps1k	4.2	S
1812RR/N	Agripro/Garst	10-2	-	-	100	-	-	89	103	99	1.7	Rps1k	3.9	MR
1922CN	Viking	10-2	-	-	97	-	-	102	100	103	1.9	Rps1k	4.3	S
1902-4	Stine	10-3	-	100	113	-	96	98	103	103	2.2	S	4.2	MR
K-231RR/SCN	KSC/Challenger	10-3	-	-	113	-	-	93	101	103	2.1	Rps1c	4.4	MR
XRO120N24	Agripro/Garst	10-3	-	-	106	-	-	91	102	101	2.0	S	3.7	MR
K-222RR/SCN	Yield King	10-3	-	-	97	-	-	94	101	100	2.0	S	3.9	R
PBR 1911NRR	PBR	10-3	-	-	94	-	-	96	102	98	1.9	Rps1k	4.3	R
K-202RR/SCN	KSC/Challenger	10-3	-	-	92	-	-	90	103	99	1.8	Rps1k	3.6	R
H-1771	Golden Harvest	10-3	-	-	88	-	-	99	99	101	1.7	S	3.4	R
K-2021 SCN	Kruger	10-3	-	-	83	-	-	108	99	100	1.8	Rps1k	3.7	S
547RRN Brand	Latham	10-4	-	-	117	-	-	93	102	102	2.2	Rps1c	3.8	MR
PB-210N	Prairie Brand	10-4	-	112	112	-	109	118	101	101	2.1	Rps1	3.7	MR
K-199RR/SCN	KSC/Challenger	10-4	-	-	108	-	-	97	98	103	1.7	S	3.6	MS
3221NRR	Gold Country	10-4	-	-	106	-	-	99	101	99	2.1	S	4.0	R
T-3206CN	Thompson	10-4	-	-	106	-	-	103	96	102	2.0	Rps1k	4.4	MS
T-3178CR	Thompson	10-4	-	-	105	-	-	96	99	104	1.7	S	3.5	S
DKB20-51	Dekalb	10-4	-	-	103	-	-	93	98	101	2.0	S	3.7	MR
1892-2	Stine	10-4	-	108	98	-	101	107	102	100	1.9	S	3.8	MR
PB-232N	Prairie Brand	10-4	-	-	92	-	-	110	99	102	2.3	Rps1k	3.7	MR
EX-227RRN	Latham	10-4	-	-	92	-	-	99	100	99	1.8	S	4.1	S
X11905RR	Golden Harvest	10-4	-	-	86	-	-	97	99	102	1.9	S	3.8	S
IA2021	Iowa AES	10-4	85	80	84	103	101	107	97	101	2.1	Rps1k	4.3	S
2121NRR	Gold Country	10-5	-	-	115	-	-	94	101	102	2.1	Rps1c	4.1	MR
2302-4	Stine	10-5	-	-	113	-	-	99	101	99	2.3	S	4.6	MR
EXP 0619N	Sands	10-5	-	-	113	-	-	93	101	101	2.0	S	4.1	MR
R-2200CN	Ramy	10-5	-	-	112	-	-	106	98	99	2.2	S	4.0	MR
PB-2220NRR	Prairie Brand	10-5	-	-	111	-	-	106	103	101	2.2	Rps1c	4.4	MR
T-3236CN	Thompson	10-5	112	107	110	99	96	96	100	100	2.3	S	4.2	MR
SOI 2221NRR	Sands	10-5	-	-	108	-	-	98	101	102	2.2	Rps1c	4.3	MS
K-232RR/SCN	Yield King	10-5	-	-	106	-	-	97	99	101	2.1	S	3.7	MS
GL1709RR	Great Lakes	10-5	-	-	105	-	-	103	96	103	1.7	S	3.7	MR
Turner	S.D. AES	10-5	104	100	103	96	94	93	97	102	2.2	S	3.7	MR
PB-1809NRR	Prairie Brand	10-5	-	-	101	-	-	101	99	101	1.8	S	3.7	MR
SOI 1871NRR	Sands	10-5	-	-	99	-	-	93	99	101	1.8	S	3.3	MS
92B62	Pioneer	10-5	-	-	97	-	-	97	103	95	2.6	S	3.9	R
2234CRR	Northstar	10-5	-	99	95	-	93	98	98	102	2.0	S	3.7	S
H-2348RR-2	Golden Harvest	10-5	-	-	93	-	-	101	99	102	2.3	S	3.8	S
K-2323 SCN	KSC/Challenger	10-5	-	-	91	-	-	106	101	98	2.1	S	4.2	S
2112RR/N	Agripro/Garst	10-6	-	-	97	-	-	84	100	97	2.1	S	3.9	MR
IA2036	Iowa AES	10-6	98	96	89	97	96	94	101	95	2.1	S	3.8	MR
K-262RR/SCN	Yield King	10-8	-	-	87	-	-	102	97	98	2.5	Rps1c	4.0	MR
K-2434 SCN	Kruger	10-8	-	-	79	-	-	98	104	96	2.1	Rps1k	3.1	S
K-266RR/SCN	Yield King	10-10	-	-	68	-	-	72	103	94	2.5	S	4.2	MR
Mean			41.7	43.2	34.4	51.6	54.1	49.5	34.2%	18.7%				
			bu/acre	bu/acre	bu/acre	bu/acre	bu/acre	bu/acre						
LSD 20%			2	2	6	2	2	4						

Performance of special-use soybean varieties, 1999-2001.

Variety	Releasing Institution	Maturity Date	Yield, Percent of Mean			Percent of Mean	
			1999-2001	000-2001	2001	Protein	Oil
Northern Zone, Crookston, Moorhead and Shelly							
Jim	N.D. AES	9-15	101	104	107	101	99
MN0201	Minn. AES	9-18	-	-	98	106	98
MN0302	Minn. AES	9-18	-	-	98	101	98
Agassiz	Minn. AES	9-19	104	103	105	102	103
Norpro	N.D. AES	9-21	-	-	103	101	102
UM3	Minn. AES	9-24	103	98	113	101	101
Danatto	N.D. AES	9-25	97	98	85	97	99
Mean			30.0 bu/acre	28.9 bu/acre	33.6 bu/acre	34.1%	18.9%
LSD 20%			3	3	6		
Central Zone, Becker, Morris and Rosemount							
MN0301	Minn. AES	9-13	90	91	88	95	106
Proto	Minn. AES	9-13	-	89	88	107	93
Danatto	N.D. AES	9-14	-	76	79	98	98
Norpro	N.D. AES	9-14	-	-	92	99	104
Minnatto	Minn. AES	9-16	78	83	89	100	98
Lambert	Minn. AES	9-19	103	107	103	97	105
Kato	Minn. AES	9-21	111	110	111	104	96
Surge	Minn. & S.D. AES	9-21	120	123	129	100	103
Toyopro	Minn. AES	9-22	93	93	90	108	92
MN0901	Minn. AES	9-23	107	110	104	96	104
Parker	Minn. AES	9-27	119	119	127	97	102
Mean			43.2 bu/acre	42.2 bu/acre	40.8 bu/acre	35.8%	18.4%
LSD 20%			2	5	6		
Southern Zone, 1998-2000; Lambertson and Waseca							
		Date	1998-2000	1999-2000	2000	Protein	Oil
Parker	Minn. AES	9-17	111	113	111	95	109
IA1009	Iowa AES	9-18	-	117	113	95	103
IA1006	Iowa AES	9-19	118	119	118	95	103
IA1005	Iowa AES	9-19	115	115	111	98	103
IA1007	Iowa AES	9-19	104	99	97	98	103
IA1008	Iowa AES	9-20	-	122	113	98	103
IA2017	Iowa AES	9-22	100	97	109	101	103
IA2041	Iowa AES	9-22	-	106	105	106	97
IA2012	Iowa AES	9-22	106	101	108	98	103
IA2011	Iowa AES	9-22	106	97	101	98	103
IA2042	Iowa AES	9-22	-	101	101	101	97
IA2016	Iowa AES	9-22	100	99	97	108	97
Vinton 81	Iowa AES	9-22	95	95	93	103	97
IA2033	Iowa AES	9-23	98	99	99	101	97
IA2032	Iowa AES	9-23	100	95	97	101	103
IA2027	Iowa AES	9-23	95	92	97	98	103
IA2024	Iowa AES	9-23	82	83	85	103	97
IA2034	Iowa AES	9-24	113	106	103	103	97
IA2020	Iowa AES	9-24	100	95	97	101	97
IA2030	Iowa AES	9-24	98	95	95	101	97
IA2028	Iowa AES	9-24	100	95	93	98	103
IA2035	Iowa AES	9-24	84	83	87	103	97
IA2029	Iowa AES	9-24	91	90	87	101	97
IA2040	Iowa AES	9-25	-	108	109	101	103
IA2025	Iowa AES	9-25	98	92	95	103	97
IA2023	Iowa AES	9-25	86	85	87	103	91
Mean			45.1 bu/acre	44.4 bu/acre	48.5 bu/acre	36.8%	16.5%
LSD 20%			2	4	6		

Characteristics of special-use soybean varieties, 2001.

Variety	Releasing Institution	Maturity Rating	Special Characteristics	Hilum Color	Phytophthora Gene	Chlorosis Score	Seeds/Pound
Northern Zone; Crookston, Moorhead and Shelly							
Jim	N.D. AES	00.8	General Purpose	Yellow	S	4.9	2,910
MN0201	Minn. AES	0.2	Higher Protein	Yellow	Rps1	3.3	3,305
MN0302	Minn. AES	0.3	General Purpose	Buff	Rps1k	4.2	3,492
Agassiz	Minn. AES	0.0	General Purpose	Buff	Rps1	4.2	3,439
Norpro	N.D. AES	0.4	Tofu	Yellow	S	3.5	3,027
UM3	Minn. AES	00.9	Small Seed	Yellow	Rps1	3.9	7,695
Danatto	N.D. AES	0.4	Small Seed	Yellow	S	3.7	5,747
Central Zone; Becker, Morris and Rosemount							
MN0301	Minn. AES	0.3	General Purpose	Yellow	Rps1	4.3	3,088
Proto	Minn. AES	0.5	High Protein	Yellow	S	4.7	2,594
Danatto	N.D. AES	0.4	Small Seed	Yellow	S	3.7	4,586
Norpro	N.D. AES	0.4	Tofu	Yellow	S	3.5	2,702
Minnatto	Minn. AES	0.9	Small Seed	Yellow	Rps1	4.8	4,729
Lambert	Minn. AES	0.7	General Purpose	Buff	Rps1	4.3	3,363
Kato	Minn. AES	1.3	Large Seed, Higher Protein	Black	Rps1	4.0	2,152
Surge	Minn. & S.D. AES	0.9	Higher Protein	Yellow	Rps1	4.2	2,236
Toyopro	Minn. AES	0.9	High Protein	Yellow	S	4.5	3,027
MN0901	Minn. AES	0.9	General Purpose	Black	Rps1	4.8	3,007
Parker	Minn. AES	1.5	General Purpose	Buff	Rps1	4.5	2,536
Southern Zone; 2000, Lamberton and Waseca							
Parker	Minn. AES	1.6	General Purpose	Buff	Rps1	4.5	2,365
IA1009	Iowa AES	1.9	General Purpose	Yellow	S	4.5	3,152
IA1006	Iowa AES	1.6	General Purpose	Black	S	4.5	2,580
IA1005	Iowa AES	1.9	Large Seed, High Protein	Yellow	S	4.0	2,281
IA1007	Iowa AES	1.9	Large Seed	Yellow	S	4.5	1,713
IA1008	Iowa AES	2.0	General Purpose	Yellow	S	4.9	2,316
IA2017	Iowa AES	2.2	Large Seed, High Protein	Yellow	S	4.5	2,162
IA2041	Iowa AES	2.1	Large Seed, High Protein	Yellow	S	4.5	2,162
IA2012	Iowa AES	2.2	Large Seed	Yellow	S	4.5	1,773
IA2011	Iowa AES	2.2	Lacks Lipoxygenase 2	Yellow	S	4.5	2,248
IA2042	Iowa AES	2.1	Large Seed, High Protein	Yellow	S	4.5	2,027
IA2016	Iowa AES	2.2	Large Seed, High Protein	Yellow	S	5.0	1,957
Vinton 81	Iowa AES	2.0	Large Seed, High Protein	Yellow	Rps1c	4.7	1,892
IA2033	Iowa AES	2.4	Lipoxygenase Free	Yellow	S	5.0	1,948
IA2032	Iowa AES	2.5	Lipoxygenase Free	Yellow	S	4.5	1,838
IA2027	Iowa AES	2.4	Lipoxygenase Free	Yellow	S	4.5	1,983
IA2024	Iowa AES	2.5	Small Seed	Yellow	S	4.0	6,306
IA2034	Iowa AES	2.5	Large Seed, High Protein	Yellow	S	4.0	2,112
IA2020	Iowa AES	2.3	Large Seed, High Protein	Yellow	S	4.5	1,924
IA2030	Iowa AES	2.3	Lipoxygenase Free	Yellow	S	4.5	2,000
IA2028	Iowa AES	2.4	Lipoxygenase Free	Yellow	S	4.5	1,991
IA2035	Iowa AES	2.4	Small Seed	Yellow	S	4.5	6,053
IA2029	Iowa AES	2.4	Lipoxygenase Free	Yellow	S	4.5	2,131
IA2040	Iowa AES	2.4	Large Seed, High Protein	Yellow	S	4.5	1,571
IA2025	Iowa AES	2.4	Lipoxygenase Free	Yellow	S	4.5	2,064
IA2023	Iowa AES	2.4	Small Seed	Yellow	S	5.0	5,821

Characteristics of publicly developed soybean varieties entered in 2001 tests.

Variety	Releasing Institution	Maturity Rating	Phytophthora Gene	BSR Reaction	SCN Reaction	Chlorosis Score
Jim	N.D. AES	00.7	S	S	S	3.4
McCall	Minn. AES	00.7	S	S	S	3.7
Glacier	Minn. AES	00.8	Rps6	S	S	3.3
Walsh	N.D. AES	00.9	Rps6	S	S	3.7
Agassiz	Minn. AES	0.0	Rps1	S	S	3.3
Traill	N.D. AES	0.0	S	S	S	2.9
Barnes	N.D. AES	0.2	Rps6	S	S	3.5
MN0201	Minn. AES	0.2	Rps1	R	S	2.9
MN0301	Minn. AES	0.3	Rps1	S	S	3.3
MN0302	Minn. AES	0.3	Rps1k	S	S	3.1
Council	N.D. AES	0.5	Rps1	S	S	3.6
Lambert	Minn. AES	0.7	Rps1	S	S	3.4
Sargent	N.D. AES	0.8	Rps6	S	S	3.4
MN0901	Minn. AES	0.9	Rps1	S	S	4.0
MN0902CN	Minn. AES	0.9	Rps1	R	R	3.4
Surge	S.D. + Minn. AES	0.9	Rps1	S	S	3.4
MN1301	Minn. AES	1.3	Rps1c	S	S	3.2
Kato	Minn. AES	1.3	Rps1	S	S	3.2
MN1302	Minn. AES	1.3	Rps1k	R	S	3.0
MN1401	Minn. AES	1.4	Rps1	S	S	3.2
Parker	Minn. AES	1.5	Rps1	S	S	3.7
Freeborn	Minn. AES	1.6	Rps1	R	R	3.3
IA1006	Iowa AES	1.6	S	R	S	3.8
MN1801	Minn. AES	1.8	Rps1c	S	S	3.8
Sturdy	Minn. AES	2.0	Rps1	S	S	3.7
IA1008	Iowa AES	2.0	S	S	R	4.0
IA2008R	Iowa AES	2.1	Rps1k	R	S	3.4
IA2021	Iowa AES	2.1	Rps1k	S	S	4.2
IA2036	Iowa AES	2.1	S	S	R	4.5
IA2050	Iowa AES	2.1	S	S	S	3.8
Turner	S.D. AES	2.2	S	S	R	4.0
IA2052	Iowa AES	2.3	S	R	S	4.0



By Gary M. Beil

Minnesota Crop Improvement Association

Serving Minnesota Agriculture for nearly a century

Minnesota Crop Improvement Association (MCIA) is one of Minnesota's oldest agricultural organizations. It was organized in 1903 by researchers at the University of Minnesota, who invited farmers interested in having improved varieties of crop plants available for sale as seed to meet together in the Territorial Pioneers Log Cabin on the State Fair grounds. The new organization was originally named the "Minnesota Field Crop Breeders Association." Its founders adopted as their first objective, "To give systematic encouragement to the use of pedigreed seed." At the 1913 annual meeting, the name of the organization was changed to Minnesota Crop Improvement Association.

To meet the objective of encouraging the use of pedigreed seed, quality assurance systems (eventually called seed certification) were implemented to control the production of high-quality seed products. The first known record of seed certification in the United States occurred in 1906, when a few small bags of Grimm alfalfa seed with documented proof of varietal purity were shipped from the Minnesota Agricultural Experiment Station (MAES) to a Colorado seed firm. The first directory of Minnesota growers with inspected and approved seed for sale was published in 1912.

Today MCIA is a nonprofit association whose primary mission is to improve the productivity, profitability and competitive position of its members. It is governed by a board of directors and operates on fees charged for services. Though independent of government ownership, the Minnesota Department of Agriculture and the MAES officially recognize MCIA as Minnesota's official seed-certifying agency and official noxious-weed-seed-free forage and mulch certifying agency.

In recent years MCIA program offerings have expanded from seed certification of field crops to a broad array of certification programs that include native grasses and forbs, and various forest reproductive materials. In addition, several more specialized seed quality assurance programs have been introduced that assure the quality of seed products not eligible for statutory seed certification programs, including the third-party verification of the presence of various genetically modified traits, such as Roundup Ready.

In addition to providing seed certification and related quality assurance services to its members, MCIA is the foundation seed organization in Minnesota, with the responsibility to maintain and increase parent stocks of varieties developed at the MAES. It also provides similar kinds of services to several private seed companies who require small parent seed increases of varieties prior to engaging in large commercial increases. MCIA has provided foundation seed services to the MAES for more than 40 years. MCIA's role in the delivery of new varieties to Minnesota agriculture through its foundation seed increase programs was expanded in 2000 to include responsibility as the exclusive licensing agent for varieties developed at the MAES that are licensed to private entities.

(Please turn to page 82.)

Gary M. Beil is President and CEO
Minnesota Crop Improvement Association.



As more highly differentiated traits have entered agricultural production systems, MCIA has implemented new programs based on the sound principles of traditional seed certification, but applied to certifying that the true genetic identity of traits entering the food chain is maintained. These Identity Preserved (IP) programs provide third-party verification that certain valuable genetic traits are present at the level necessary to add significant value to the end product. These programs also are capable of certifying that the grain entering the food chain is free of specific genetic contamination within accepted tolerances.

The newest program offering from MCIA is organic certification. MCIA has filed an application to become an accredited organic certifier with the USDA's National Organic Program, and with the State of Minnesota. Upon accreditation by the USDA, MCIA will be able to offer organic certification services to the increasing number of members who chose to be involved in organic production.

MCIA is a charter member of the Association of Official Seed Certifying Agencies (AOSCA), an international organization of seed-certifying bodies that assists in the development and coordination of standards for its programs, and provides international tag recognition for the shipment of seed products between AOSCA member countries. All MCIA seed and grain certification programs are endorsed by AOSCA.

In 2003 MCIA will complete a century of experience and integrity in serving Minnesota agriculture. MCIA is committed to continuing its legacy of service as new production systems and value-added opportunities emerge in the future, thereby helping Minnesota producers to be more competitive, productive and profitable. That is our mission!

Sources of Registered and Certified Seed

The listing of Minnesota Crop Improvement Association Member-growers with certified seed for sale in 2002 that follows is provided as a service to prospective seed buyers. It is not to be construed as an offer for sale by the grower and is not to be considered as public advertising or as the posting of public notice in any manner. Growers who wish to promote and sell seed in Minnesota must comply with all current state regulations governing seed sales.

Notice to Seed Buyers

Should you ever suspect misrepresentation, mislabeling or violation of regulations under which certified seed classes are produced and marketed, contact MCIA at 800-510-6242.

While MCIA cannot assume financial responsibility for the performance of seed purchased from sources listed, or for disagreements over sales that may arise from this list, any complaint about certified seed received by MCIA will be investigated.

Should a claim over seed performance involving MCIA arise, it must be addressed as provided in Minnesota Department of Agriculture Rules for Arbitration of Seed Performance Disputes.

The seller of certified seed must supply seed representative of the samples submitted to, and approved for certification by, MCIA. Seed purchasers should insist on certification being complete, with certified seed tags attached to bags or a bulk sale certificate furnished with bulk seedlots.

Growers with Certified and Registered seed for sale in 2002. Please contact growers directly for information on seed quantity and price.

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

BARLEY

Conlon

Kittson	Bloomquist Farms, Inc., Drayton	218-455-3863	R
Marshall	Philipp, D. Joe, Goodridge	218-681-5574	C
Marshall	Riopelle, Larry, Argyle	218-437-8247	R
Norman	Nepstad, Leland, Hendrum	218-861-6288	C
Out of state	Anderson, Gerald D, Grand Forks	701-775-8766	R C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	C

Drummond

Kittson	Nelson, Merle L., Drayton	218-455-3508	R
Marshall	Jensen Farms, Stephen	218-478-3398	R
Marshall	Peterson, Maynard, Stephen	218-478-3859	R
Norman	Chisholm, Keith P., Gary	218-356-8674	R
Norman	Chisholm, Mark M., Gary	218-356-8507	R
Polk	Mat - Co., Inc., Fosston	218-435-6667	R

Lacey

Clay	Murphy, Dan, Felton	218-494-3414	C
Clay	Tang, Gordon & Sons, Felton	218-494-3643	C
Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Grant	Adams Seed, Wendell	218-458-2151	C
Grant	Lacey Company, Gerald A., Wendell	218-458-2595	R C
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	R
Kandiyohi	Loge, Alan, Willmar	320-235-4178	C
Kittson	Bloomquist Farms, Inc., Drayton	218-455-3863	R C
Kittson	Jensen, A. Gay Farms Co., Drayton	701-454-6294	C
Kittson	Johnson Farms, Inc., Lloyd, Karlstad	218-436-2817	R
Kittson	Peterson, Ronald L., Lake Bronson	218-754-4631	C
Kittson	Weinlander Seed Company, Drayton	701-454-6427	C
Mahnomen	Greenhills, Inc., Mahnomen	218-935-2446	C
Mahnomen	Haugo, David, Waubun	218-473-2254	C
Mahnomen	Pazderwik Farms, Inc., Waubun	218-473-2232	C
Mahnomen	Spaeth, Andy, Mahnomen	218-935-5809	C
Marshall	Farmers Elevator Company, Alvarado	218-965-4812	R C
Marshall	Green, Carl M., Strandquist	218-597-2861	C
Marshall	Jensen Farms, Stephen	218-478-3398	R C
Marshall	KJ - KJ Farms, Argyle	218-437-8221	C
Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Peterson, Maynard, Stephen	218-478-3859	R
Marshall	Riopelle, Larry, Argyle	218-437-8247	R
Marshall	Rivard's Quality Seeds, Inc., Argyle	218-437-6638	R C
Marshall	Stasynski, David, Strandquist	218-436-2717	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Norman	Chisholm, Keith P., Gary	218-356-8674	R
Otter Tail	Brenden, Bruce L., Rothsay	218-867-2410	R C
Out of state	Anderson, Gerald D, Grand Forks	701-775-8766	R
Pennington	Engelstad Farms of Rocksbury, Thief River Falls	218-682-1800	C
Pennington	Scholin Farms, Thief River Falls	218-964-5268	R C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	R
Polk	Capistran, Kevin, Crookston	218-281-5705	C
Polk	Danielson, Ellsworth, Fosston	218-435-1729	C
Polk	Larson Farms, Inc., Ralph, East Grand Forks	218-773-1463	R
Polk	Novak, James, Angus	218-745-5948	C
Polk	Perry Farms, Inc. (Charles), Crookston	218-281-4114	C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	R C
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R
Polk	Pulkrabek, Anthony H., Angus	218-745-5053	R
Polk	Ross Seed Co., Fisher	218-891-2211	C
Polk	Thorson Farm, Inc., J.O., East Grand Forks	218-893-2285	R C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R
Roseau	Habstritt Farms, Inc., Roseau	218-463-1193	R C
Roseau	Magnuson Farms, Roseau	218-463-2374	C
Todd	Sweeney Seed Farm, Inc., Bertha	218-924-2921	C

Traverse	Raguse, William, Tintah	320-563-4865	R
Wilkin	Beyer Seed Farm, Kent	218-643-5126	C
Wilkin	Friederichs Farm, Foxhome	218-643-2363	R
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	R C
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C

MNBrite

Dakota	Johnson, Scott & Terry, Farmington	651-463-8236	C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	C

Robust

Clay	Olek, Bradley, Felton	218-494-3440	C
Clay	Olek, Vernard, Felton	218-494-3440	C
Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Grant	Adams Seed, Wendell	218-458-2151	C
Kittson	Bloomquist Farms, Inc., Drayton	218-455-3863	R C
Mahnomen	Greenhills, Inc., Mahnomen	218-935-2446	C
Marshall	Anderson, Harvey O. & Luther H., Stephen	218-495-3305	C
Marshall	Double A Farms, Viksag	218-523-4245	C
Meeker	Peterson, Melvin, Atwater	320-877-7585	R
Meeker	Peterson, Russell M., Grove City	320-877-7793	C
Murray	Blankers, Jerry, Lake Wilson	507-873-3103	C
Otter Tail	Crop Production Services, Perham	218-346-2355	C
Otter Tail	Wehking Farm, Parkers Prairie	218-338-2161	C
Pennington	Trontvet, Daniel, Thief River Falls	218-681-4028	C
Polk	Brule, David A., Crookston	218-281-2944	C
Polk	Mat - Co., Inc., Fosston	218-435-6667	C
Roseau	Cenex Harvest States Salol Elevator (Greenbush)	218-782-2111	C
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
Todd	Brekke, Floyd, Eagle Bend	218-738-2672	C
Todd	Faust, Kevin, Long Prairie	320-732-3361	C
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C

Royal

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Goodhue	Buck, Don, Zumbrota	507-732-5186	R
Houston	Troendle Farms, Spring Grove	507-724-2211	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	R C

Stander

Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	R C
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BEANS

Red Hawk

Grant	Kaphahn, John M., Elbow Lake	218-683-4604	C
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BIG BLUESTEM

Bison

Roseau	Baumgartner Farms, Inc., Roseau	218-463-1332	C
Roseau	Dahl, Elmer, Roseau	218-463-3643	C
Roseau	Erickson, Douglas, Roseau	218-463-3535	C

Norcen

Lake of the Woods Pieper, Danny, Williams	218-783-4352	C
Lake of the Woods Pieper, Robert, Williams	218-783-4352	R C

CORN

E500 Hybrid

Renville	Ernestvedt Bros., Sacred Heart	320-765-2728	C
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E580 Hybrid

Renville	Ernestvedt Bros., Sacred Heart	320-765-2728	C
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E600 Hybrid

Renville	Ernestvedt Bros., Sacred Heart	320-765-2728	C
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E630 Hybrid

Renville Enestvedt Bros., Sacred Heart 320-765-2728

E670 Hybrid

Renville Enestvedt Bros., Sacred Heart 320-765-2728

E810 Hybrid

Renville Enestvedt Bros., Sacred Heart 320-765-2728

DURUM WHEAT

Lesbock

Norman Nepstad, Leland, Hendrum 218-861-6288 C

Mountrail

Marshall Omdahl Ridge Farms, Philip Omdahl, Grand Forks 218-745-5595 R

Polk Peterson, D.W., Inc., Warren 218-745-4507 C

Plaza

Marshall Omdahl Ridge Farms, Philip Omdahl, Grand Forks 218-745-5595 C

FLAX

Pembina

Kittson Bloomquist Farms, Inc., Drayton 218-455-3863 R

INDIANGRASS

Tomahawk

Roseau Baumgartner Farms, Inc., Roseau 218-463-1332 C

KENTUCKY BLUEGRASS

Minnfine

Roseau Habstritt Farms, Inc., Roseau 218-463-1193 C

Roseau Marvin's, Warroad 218-386-1333 C

Park

Lake of the Woods Pieper, Jerry, Williams 218-783-4630 C

Lake of the Woods Pieper, Robert, Williams 218-783-4352 C

Roseau Eastman, Bob, Roseau 218-463-2873 C

Roseau Eastwood Estates/R&G Trucking (Hertzen, Rick), Roseau 218-424-7509 C

Roseau Evergreen Farms, Inc. (Johnson, Thomas) Roseau 218-425-7432 C

Roseau Goos Farms, Inc., Roseau 218-424-7748 C

Roseau Grahm Farms, % Mike Grahm, Roseau 218-463-1765 C

Roseau Grahm, Greg R., Warroad 218-463-3570 C

Roseau Habstritt Farms, Inc., Roseau 218-463-1193 R C

Roseau Hagen, I. & L. Farms, Inc., Badger 218-528-3523 C

Roseau Johnson, Steve, Sabol 218-424-7070 C

Roseau Magnusson Farms, Roseau 218-463-2374 C

Roseau Magnusson, Ardell, Roseau 218-463-1647 C

Roseau Marvin's, Warroad 218-386-1333 C

Roseau Millner Farms, Gene Millner, Roseau 218-463-2164 C

Roseau Northern Minnesota Bluegrass, Roseau 218-463-3888 R C

Roseau Ohlson, Mark, Roseau 218-463-3958 C

Roseau Santl Farms % Ken Santl, Roseau 218-463-2686 C

Roseau Slater, Gary, Roseau 218-463-1064 C

Roseau Swanson, Leslie, Roseau 218-463-2702 C

Roseau Wahlberg, John, Roseau 218-386-2453 C

OATS

Belle

Mecker Johnson Seeds of Dassel, Inc., Dassel 320-275-2430 C

Dane

Houston Trocandle Farms, Spring Grove 507-724-2211 C

Mecker Johnson Seeds of Dassel, Inc., Dassel 320-275-2430 C

Olmsted Meyer's Seeds, Inc., Elgin 507-876-2482 C

Redwood Sawvells Seed, Inc., Clements 507-692-2240 C

Wabasha Zabel Seeds, Plainview 507-534-2487 C

Wright Terning Seeds, Inc., Cokato 320-286-2168 C

Ebeltoft

Beltrami Smischney, Chad, Northome 218-647-8356 C

Clay Thompson, David A., Barnesville 218-493-4499 C

Clay Tobolt Seed, Moorhead 218-287-2904 C

Otter Tail Crop Production Services, Perham 218-346-2355 C

Otter Tail Peeters, John, Menahga 218-385-2609 C

Polk Fosston Co-op Seed House, Fosston 218-435-6222 C

Todd Sweetney Seed Farm, Inc., Bertha 218-924-2921

Gem

Blue Earth Ramy Seed Co., Michael Ramy, Mankato 507-387-4091 C

Brown Cunningham Seed Farms, Sleepy Eye 507-794-7323 C

Brown Rossbach Lakeside Seeds, Inc., Hanska 507-794-7698 C

Freeborn Albert Lea Seed House, Inc., Albert Lea 507-373-3161 C

Kandiyohi Behm Seed Company, Atwater 320-974-3003 C

Le Sueur Stangler Farm Seed, Dick, Kilkenny 507-595-2883 C

Meeker Johnson Seeds of Dassel, Inc., Dassel 320-275-2430 C

Meeker Wigen Seed Farm, Litchfield 320-693-8182 C

Mower Grass & Sons Seed Service, Le Roy 507-324-5820 C

Olmsted Meyer's Seeds, Inc., Elgin 507-876-2482 C

Redwood Sawvells Seed, Inc., Clements 507-692-2240 C

Rice Werner Farm Seeds, Dundas 507-645-7995 C

Stearns Nietfeld Farm, Inc., Melrose 320-987-3442 C

Swift Falk Seed Farm, Murdock 320-875-4341 C

Todd Perish Farms, Inc., Browerville 320-594-6586 C

Wabasha Dill Company, LLC (Valerie Ahlers), Wabasha 651-565-2611 C

Wabasha Zabel Seeds, Plainview 507-534-2487 C

Wright Terning Seeds, Inc., Cokato 320-286-2168 C

Jerry

Blue Earth Ramy Seed Co., Michael Ramy, Mankato 507-387-4091 R C

Clay Tobolt Seed, Moorhead 218-287-2904 C

Freeborn Albert Lea Seed House, Inc., Albert Lea 507-373-3161 C

Marshall Newfolden Co-op Elevator Assn., Newfolden 218-874-7465 C

Meeker Johnson Seeds of Dassel, Inc., Dassel 320-275-2430 C

Mower Rueter, Elmer & David, Austin 507-567-2242 C

Otter Tail Crop Production Services, Perham 218-346-2355 C

Polk Fosston Co-op Seed House, Fosston 218-435-6222 C

Redwood Sawvells Seed, Inc., Clements 507-692-2240 R

Stearns Middendorff Seed Farm, Sauk Centre 320-352-6053 C

Swift Falk Seed Farm, Murdock 320-875-4341 R C

Jim

Meeker Johnson Seeds of Dassel, Inc., Dassel 320-275-2430 R

Loyal

Otter Tail Crop Production Services, Perham 218-346-2355 C

Otter Tail Kimaert, Paul, New York Mills 218-385-3576 C

Otter Tail Miller, Donald, Henning 218-583-2451 R

Otter Tail Peeters, John, Menahga 218-385-2609 C

Milton

Todd Schwabke, Lloyd, Grey Eagle 320-285-5417 C

Ogle

Faribault Watowwan Farm Service, Kiester 507-294-3697 C

Paul

Freeborn Albert Lea Seed House, Inc., Albert Lea 507-373-3161 C

Meeker Wigen Seed Farm, Litchfield 320-693-8182 C

Polk Fosston Co-op Seed House, Fosston 218-435-6222 C

Stearns Middendorff Seed Farm, Sauk Centre 320-352-6053 C

Richard

Carlton Koskunen, Art, Kettle River 218-275-4931 C

Dakota Johnson, Scott & Terry, Farmington 651-463-8236 C

Douglas Sward Seed Farm, Nelson 320-762-0143 C

Douglas Thompson Farms, Keosauqua 320-965-2486 C

Freeborn Albert Lea Seed House, Inc., Albert Lea 507-373-3161 R C

Kandiyohi Esge, Alan, Williams 320-235-4178 C

Le Sueur Haas Seed Farm, Le Sueur 507-665-3683 R C

Le Sueur Stangler Farm Seed, Dick, Kilkenny 507-595-2883 R C

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Lincoln	Jerzak, William W., Ivanhoe	507-694-1736	C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Meeker	Peterson, Melvin, Atwater	320-877-7585	R
Meeker	Smith, Steven, Darwin	320-693-6769	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	R C
Mower	Zimmerman Seeds, Racine	507-378-2077	R C
Nicollet	Anderson & Sons, St. Peter	507-246-5032	C
Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	C
Pine	Cabak, Daniel C., Hinckley	320-384-7377	R C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	R C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Redwood	Sawwell's Seed, Inc., Clements	507-692-2240	C
Renville	JSE, Inc. (Johnson Seed Farm), Sacred Heart	320-765-2225	R
Rice	Werner Farm Seeds, Dundas	507-645-7995	C
Scott	Hauer Farms, Inc., Shakopee	952-445-7554	C
Stearns	Jokeland Farms, Joel & Kathy Ebnet, Holdingford	320-746-2147	C
Stearns	Nietfeld Farm, Inc., Melrose	320-987-3442	R
Swift	Falk Seed Farm, Murdock	320-875-4341	C
Wabasha	Dill Company, LLC (Valerie Ahlers), Wabasha	651-565-2611	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	R
Riser			
Blue Earth	Ramy Seed Co., Michael Ramy, Mankato	507-387-4091	R
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	R
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
Stearns	Nietfeld Farm, Inc., Melrose	320-987-3442	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C
Wabasha	Dill Company, LLC (Valerie Ahlers), Wabasha	651-565-2611	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	C
Sesqui			
Brown	Cunningham Seed Farms, Sleepy Eye	507-794-7323	R
Brown	Rosbach Lakeside Seeds, Inc., Hanska	507-794-7698	R
Douglas	Sward Seed Farm, Nelson	320-762-0143	R
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	R
Lac qui Parle	Harwick, Kenneth, Madison	320-752-4455	R
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	R
Lincoln	Lincoln County Feed & Seed, Ivanhoe	507-694-1243	R
Lyon	Tholen Seeds, Tracy	507-629-3505	R
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	R
Meeker	Smith, Steven, Darwin	320-693-6769	R
Mower	Zimmerman Seeds, Racine	507-378-2077	R
Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	R
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	R
Rice	Werner Farm Seeds, Dundas	507-645-7995	R
Todd	Schwanke, Lloyd, Grey Eagle	320-285-5417	R
Wabasha	Dill Company, LLC (Valerie Ahlers), Wabasha	651-565-2611	R
Wright	Terning Seeds, Inc., Cokato	320-286-2168	R C
Troy			
Otter Tail	Crop Production Services, Perham	218-346-2355	C
Otter Tail	Miller, Donald, Henning	218-583-2451	C
Todd	Schwanke, Lloyd, Grey Eagle	320-285-5417	C
Vista			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	C
Mower	Zimmerman Seeds, Racine	507-378-2077	C
Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	C
Wabasha	Zabel Seeds Plainview	507-534-2487	C
Wabasha			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C

Kandiyohi	Loge, Alan, Willmar	320-235-4178	R
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	R
Lyon	Blomme, Bill, Marshall	507-532-6092	R
McLeod	Thalman Seeds Inc., Plato	320-238-2185	C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	R
Meeker	Smith, Steven, Darwin	320-693-6769	R
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	R
Norman	Chisholm, Mark M., Gary	218-356-8507	R
Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	R
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R
Redwood	Sawwell's Seed, Inc., Clements	507-692-2240	R
Rice	Werner Farm Seeds, Dundas	507-645-7995	R
Swift	Falk Seed Farm, Murdock	320-875-4341	R
Todd	Buchholz Farms, Grey Eagle	320-285-5401	R
Todd	Faust, Kevin, Long Prairie	320-732-3361	R
Wabasha	Dill Company, LLC (Valerie Ahlers), Wabasha	651-565-2611	R
Wabasha	Zabel Seeds, Plainview	507-534-2487	R

RED CLOVER

Marathon

Roseau	Carlson, Dean A., Roseau	218-425-7763	C
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RYE

Rymin

Meeker	Wigen Seed Farm, Litchfield	320-693-8182	R
Swift	Falk Seed Farm, Murdock	320-875-4341	R

SOYBEANS

Accord

Clay	Agri-Tel, Inc. (Carrol Duerr), Moorhead	218-287-5510	
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Agassiz

Polk	Clementson, Jon, Erskine	218-687-2345	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C

Barnes

Clay	Anderson, Lynn, Moorhead	218-287-1765	C
Clay	Heartland Seeds, Moorhead	218-585-4621	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Marshall	Baird Farms, Inc., Warren	218-745-5330	C
Marshall	Peterson Farms of Warren, D.L., Inc., Warren	218-745-4077	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Polk	Vig Farms Inc., Fosston	218-435-1316	C

Corsoy 79

Faribault	Willette Seed Farm, Inc., Delavan	507-854-3595	C
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Council

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
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Evans

Becker	Hein Farms, Inc., Audubon	218-439-6621	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	R

Freeborn

Faribault	Watsonwan Farm Service, Kiester	507-294-3697	C
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HP204

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	R C
Olmsted	Frontier Commodities, Byron	507-775-2174	C

Hardin 91

Meeker	Smith, Steven, Darwin	320-693-6769	C
Scott	Hauer Farms, Inc., Shakopee	952-445-7554	C

IA1006

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Jackson	Brunk Bros., Gene or William, Brewster	507-842-5471	C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	C

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Lincoln	Jerzak, John, Ivanhoe	507-694-1834	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	C
Scott	Hauer Farms, Inc., Shakopee	952-445-7554	C
IA1007			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Meeker	Smith, Steven, Darwin	320-693-6769	R
Olmsted	Frontier Commodities, Byron	507-775-2174	R C
IA1008			
Jackson	Brunk Bros., Gene or William, Brewster	507-842-5471	C
IA2008R			
Brown	Rosbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
Faribault	Watsonwan Farm Service, Kiester	507-294-3697	C
Faribault	Willette Seed Farm, Inc., Delavan	507-854-3595	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Le Sueur	Birr Brothers, Mark & Gene, Kasota	507-931-2218	R C
Scott	Hauer Farms, Inc., Shakopee	952-445-7554	C
IA2020			
Olmsted	Frontier Commodities, Byron	507-775-2174	R
IA2021			
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	R C
Lyon	Olson, Jonathan, Cottonwood	507-423-6340	C
Nicollet	Anderson & Sons, St. Peter	507-246-5032	C
IA2041			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
IA2050			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Lac qui Parle	Hermanson Seed Plant, Boyd	320-855-2582	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	C
IA2053			
Faribault	Willette Seed Farm, Inc., Delavan	507-854-3595	R
Jim			
Clay	Fischer, Wilbert & Dale, Glyndon	218-498-2741	C
Kitsop	Carlson, James A., Hallock	218-843-3483	R
Kitsop	Petersen, Ronald L., Lake Bronson	218-754-4631	C
Marshall	Gryskiewicz, Donald & Jeff, Stephen	218-437-8164	R
Marshall	Hammerlund Farms, Oslo	218-695-3481	C
Marshall	KJ - KJ Farms, Argyle	218-437-8221	C
Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Peterson Farms of Warren, D.L., Inc., Warren	218-745-4077	C
Marshall	Peterson, Maynard, Stephen	218-478-3859	C
Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Norman	Chisholm, Michael, Gary	218-356-8507	C
Polk	Clewenson, Jon, Erskine	218-687-2345	R C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Polk	Johnstad, David, Beltrami	218-926-5663	C
Polk	Larson Farms, Jerry Larson, Climax	218-857-3345	C
Polk	Vig - Co., Inc., Fosston	218-435-6667	R C
Polk	Vig Farms Inc., Fosston	218-435-1316	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R C
Roseau	Centex Harvest Stores		
	Salol Elevators (Roseau), Roseau	218-465-1955	R
Kato			
Swift	Ealk Seed Farm, Murdock	320-875-4341	R C
Wilkin	K Lindt, Neal, Campbell	218-630-5511	R
Lambert			
Douglas	Sward Seed Farm, Nelson	320-762-0243	R C
Grant	Adams Seed, Wendell	218-458-2251	C
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	R C
Scott	Hauer Farms, Inc., Shakopee	952-445-7554	C
Stevens	Haberer Seed Farm, Morris	320-795-2468	C
Swift	Falk Seed Farm, Murdock	320-875-4341	R C
Wilkin	Steenblock Farms, Dale, Campbell	218-630-5500	C

MN0201

Clay	Anderson, Lynn, Moorhead	218-287-1765	R
Clay	Heartland Seeds, Moorhead	218-585-4621	R
Clay	Lee Seed Farm, Borup	218-494-3330	R
Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	R
Clay	Zimmerman, Wayne, Ulen	218-596-8628	R
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	R
Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Peterson, D.W., Inc., Warren	218-745-4077	R
Marshall	Peterson, Maynard, Stephen	218-478-3859	R
Marshall	Rivard's Quality Seeds, Inc., Argyle	218-437-6638	R
Norman	Chisholm, Keith P., Gary	218-356-8674	R
Polk	Peterson, D.W., Inc., Warren	218-745-4077	R
Polk	Thorsen Farm, Inc., J. O., East Grand Forks	218-893-2285	R
Polk	Vig Farms Inc., Fosston	218-435-1316	R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R
Wilkin	Larson Farms/Eldon, Rothsay	218-867-2674	R
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	R

MN0301

Clay	Fuglie, Duane, Ulen	218-596-8528	C
Clay	Johnson, Brian M., Hawley	218-962-3316	C
Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7266	C
Clay	Tobolt Seed, Moorhead	218-287-2904	C
Clay	West Central Ag Service, Ulen	218-596-8821	C
Clay	Zimmerman, Wayne, Ulen	218-596-8628	C
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
Marshall	Gryskiewicz, Donald & Jeff, Stephen	218-437-8164	C
Norman	Black Bros., Fertile	218-945-6343	C
Norman	Black, Roger, Bejou	218-945-3550	C
Norman	Chisholm, Keith P., Gary	218-356-8674	C

MN0302

Clay	Anderson, Lynn, Moorhead	218-287-1765	R
Clay	Hastings, Joseph, Felton	218-494-3935	C
Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7266	R
Clay	Tande, Harman, Moorhead	218-287-3977	R
Clay	Tobolt Seed, Moorhead	218-287-2904	R
Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	R C
Clay	Zimmerman, Wayne, Ulen	218-596-8628	R
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Peterson Farms of Warren, D.L., Inc., Warren	218-745-4077	R
Marshall	Peterson, Maynard, Stephen	218-478-3859	R
Marshall	Riopelle, Earl & Brent, Argyle	218-437-8291	R
Marshall	Rivard's Quality Seeds, Inc., Argyle	218-437-6638	R C
Norman	Brandt, Wayne G. & John, Ada	218-784-4774	R
Norman	Chisholm, Keith P., Gary	218-356-8674	R C
Norman	Chisholm, Mark M., Gary	218-356-8507	R C
Norman	Ellingson Farms, Borup	218-861-6605	R
Otter Tail	Brenden, Bruce L., Rothsay	218-867-2470	R
Otter Tail	Keller, Clifford L., Fergate Falls	218-736-4664	R
Pennington	Engelstad Farms of Rocksbury, Thief River Falls	218-681-1600	R
Pennington	Swanson, Curtis W., Thief River Falls	218-960-5619	C
Polk	Clementson, John, Erskine	218-687-2345	R C
Polk	Peterson, D.W., Inc., Warren	218-745-4077	R
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R
Polk	Tiedemann, Gene R., Euclid	218-281-6723	R
Wilkin	Haugrud Seed Plant, Rothsay	218-495-4275	R
Wilkin	Larson Farms/Eldon, Rothsay	218-867-2674	R
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	R
Wilkin	Torkeison, Dennis & Brent, Foxhome	218-736-4667	R

MN1301

Renville	Kieckhefer, Greg, Hector	507-438-8167	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C

MN1302

Dodge	Kots, William, Dodge Center	507-374-6786	R
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Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Kittson	Oowski, Terry, Hallock	218-843-3371	C	Roseau	Johnson, Quentin L., Badger	218-528-3228	C
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C	Roseau	K & L Farms (Craig Lee), Wannaska	218-425-7719	C
Kittson	Rickenberg, Jeff, Kennedy	218-674-4231	C	Roseau	Kukowski, Jim, Strathcona	218-781-2478	R
Kittson	Sedenquist Farms, Inc., Kennedy	218-674-4218	C	Roseau	Magnusson Farms, Roseau	218-463-2374	C
Kittson	Sorenson, David, Hallock	218-843-3436	C	Roseau	Olafson, Mark, Roseau	218-463-3958	
Kittson	Sugden, William, Hallock	218-843-2593	C	Stevens	Haberer Seed Farm, Morris	320-795-2468	C
Kittson	Wiese, Inc., Kenneth A., Humboldt	218-379-3120	C	Stevens	Hallman, Howard, Chokio	320-324-7310	C
Kittson	Younggren, Dan, Hallock	218-843-3318	C	Traverse	Johnson, David A., Wheaton	320-563-4533	C
Lac qui Parle	Hermanson Seed Plant, Boyd	320-855-2582	C	Traverse	Johnson, Merton, Wheaton	320-563-8025	R
Lake of the Woods	Bitter, Willis M., Williams	218-783-6292	R	Traverse	Raguse, William, Tintah	320-563-4865	C
Lake of the Woods	Helmstetter Farm, Roosevelt	218-442-7285	C	Wilkin	Beyer Seed Farm, Kent	218-643-5126	R C
Lake of the Woods	Pieper Farms, Jerry, Williams	218-783-6610	R	Wilkin	Friederichs Farm, Foxhome	218-643-2363	C
Lincoln	Jerzak, Jerome, Ivanhoe	507-694-1582	R	Wilkin	Haugrud Seed Plant, Rotisay	218-493-4275	R C
Lincoln	Jerzak, William W., Ivanhoe	507-694-1736	C	Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C
Mahnomen	Haugo, David, Waubun	218-473-2254	C	Wilkin	Larson Farms/Eldon, Rothsay	218-867-2674	C
Mahnomen	McNamee, Daniel, Mahnomen	218-935-2391	C	Wilkin	Nelson, Bradley, Wolverton	218-995-2299	R C
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C	Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C
Marshall	Anderson, Joel, Alvarado	218-965-4597	R	Bac Up			
Marshall	Baird Farms, Inc., Warren	218-745-5330	R C	Kittson	Klein, David, Hallock	218-843-2451	C
Marshall	Farmers Elevator Company, Alvarado	218-965-4812	C	Kittson	Klein, Todd, Scott & Kevin, Hallock	218-843-2764	C
Marshall	Green, Carl M., Strandquist	218-597-2861	C	Dandy			
Marshall	Gryskiewicz, Donald & Jeff, Stephen	218-437-8164	R	Goodhue	NorthStar Genetics, Wanamingo	507-824-2878	
Marshall	Hammerlund Farms, Oslo	218-695-3481	C	Ember			
Marshall	Holte, Steven, Grygla	218-294-6537	C	Marshall	Gostanzik, Stan, Argyle	218-437-8149	R
Marshall	Hoper, Gary J., Stephen	218-478-2441	C	Marshall	Gryskiewicz, Donald & Jeff Stephen	218-437-8164	R
Marshall	Jensen Farms, Stephen	218-478-3398	R C	Marshall	Jensen Farms, Stephen	218-478-3398	C
Marshall	Kowalski, James, Stephen	218-478-3899	R	Marshall	Kuznia, Kenneth J., Argyle	218-437-8203	R
Marshall	Peterson, John C., Stephen	218-478-3555	C	Polk	Peterson, D.W., Inc., Warren	218-745-4507	C
Marshall	Peterson, Maynard, Stephen	218-478-3859	R	Glupro			
Marshall	Riopelle, Earl & Brent, Argyle	218-437-8291	C	Clay	Agri-Tel, Inc. (Carrol Duerr), Moorhead	218-287-5510	R
Marshall	Riopelle, Larry, Argyle	218-437-8247	R	Gunner			
Marshall	Rivard Farms, G.A., Argyle	218-437-6638	C	Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	
Marshall	Robertson Brothers, Argyle	218-437-6411	R	Polk	Capistran Seed Company, Crookston	218-281-7840	
Marshall	Stusynski, David, Strandquist	218-436-2717	C	Polk	Ross Seed Co., Fisher	218-891-2211	
Marshall	Widner, Neil, Stephen	218-478-3616	R	Roseau	Kukowski, Jim, Strathcona	218-781-2478	
Marshall	Yutrzenska, Don and Mark, Argyle	218-437-8428	C	HJ98			
Mecker	Dahlman Seed Co., Dassel	320-275-2527	C	Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	C
Norman	Brandt, Robert Jr., Ada	218-784-4093	C	Lake of the Woods	Pieper Farms, Jerry, Williams	218-783-6610	R
Norman	Chisholm, Keith P., Gary	218-356-8674	C	Marshall	Jensen Farms, Stephen	218-478-3398	C
Norman	Circle C Seeds, Gary	218-356-8214	C	Marshall	Riopelle, Larry, Argyle	218-437-8247	R
Norman	Malme, Cecil, Shelly	218-886-8488	C	Pennington	Scholin Farms, Thief River Falls	218-964-5268	R
Norman	Opsahl, Ross, Twin Valley	218-584-5173	C	Polk	Peterson, D.W., Inc., Warren	218-745-4507	C
Norman	Ramstad Brothers, Ada	218-784-7190	C	Polk	Sonstetie, Gordon & Gary, Winger	218-938-4189	C
Norman	Sirjord Farms, Bejou	218-356-8285	C	Polk	Thorson, Osmund and Chad, East Grand Forks	218-893-2285	C
Otter Tail	Walkup, John, Campbell	218-739-2580	C	Polk	Vig Farms Inc., Fosston	218-435-1316	R C
Pennington	Erickson, John E., Red Lake Falls	218-964-5334	C	Hamer			
Pennington	Scholin Farms, Thief River Falls	218-964-5268	R C	Lincoln	Lincoln County Feed & Seed, Ivanhoe	507-694-1243	
Pennington	Swanson, Curtis W., Thief River Falls	218-964-5619	C	Ingot			
Polk	Balstad, Scott, Fosston	218-435-6311	C	Becker	Hein Farms, Inc., Audubon	218-439-6621	C
Polk	Brule, David A., Crookston	218-281-2944	C	Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	C
Polk	Brule, Todd, Crookston	218-281-5148	C	Clay	Evert Farms Ltd Partnership, Sabin	218-789-7338	R
Polk	Danielson, Ellsworth, Fosston	218-435-1729	C	Clay	Hastings, Joseph, Felton	218-494-3935	C
Polk	Larson, Ray H., Inc., Angus	218-745-5923	C	Clay	Heartland Seeds, Moorhead	218-585-4621	C
Polk	Ostena, Sidney & DeWayne, Mc Intosh	218-563-7395	C	Clay	Iverson, Dwight, Hitterdal	218-962-3219	C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	R C	Clay	Krabbenhoff & Sons, Inc., Sabin	218-789-7206	C
Polk	Tiedemann, Gene R., Euclid	218-281-6723	C	Clay	Lee Seed Farm, Borup	218-494-3330	C
Polk	Wentzel, Walton Farms, Inc., Fisher	218-281-2207	C	Clay	Petermann Seeds, Inc., Hawley	218-483-3302	R C
Red Lake	Myhre Farms, Red Lake Falls	218-698-4485	C	Clay	Peterson Farm, Sherwood E., Sabin	218-789-7378	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R C	Clay	Sillers Farm, Moorhead	218-233-7841	C
Red Lake	Vanhuver Farm, Red Lake Falls	218-253-2490	C	Clay	Valan, Orlen Jr., Moorhead	218-236-9479	C
Redwood	Sawvell's Seed, Inc., Clements	507-692-2248	C	Clay	West Central Ag Service, Ulen	218-596-8821	C
Renville	JSF, Inc. (Johnson Seed Farm), Sacred Heart	320-765-2225	C	Clay	Zimmerman, Wayne, Ulen	218-596-8628	C
Roseau	Genex Harvest States			Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Roseau	Salol Elevator (Greenbush), Greenbush	218-782-2111	C	Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R C
Roseau	Genex Harvest States						
Roseau	Salol Elevators (Roseau), Roseau	218-463-1955	R				
Roseau	Habstritt Farms, Inc., Roseau	218-463-1193	C				

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Grant	Adams Seed, Wendell	218-458-2151	C	Ivan		
Grant	Backman Seeds, Inc., Herman	320-677-2231	R C	Lincoln	Lincoln County Feed & Seed, Ivanhoe	507-694-1243
Grant	Kapphahn, John M., Elbow Lake	218-685-4604	C	Renville	Ziller Seed Company, Inc., Bird Island	320-365-3674
Grant	Thiel Seed Service, Wendell	218-458-2415	C	Keystone		
Lincoln	Jerzak, Jerome, Ivanhoe	507-694-1582	C	Polk	Ross Seed Co., Fisher	218-891-2211
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C	Redwood	Sawvell's Seed, Inc., Clements	507-692-2240
Marshall	Double A Farms, Viking	218-523-4245	C	Kulm		
Marshall	Hammerlund Farms, Oslo	218-695-3481	C	Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161 C
Marshall	Jensen Farms, Stephen	218-478-3398	R C	Lars		
Marshall	Nelson Farm % Doyle, Goodridge	218-681-6972	R	Polk	Ross Seed Co., Fisher	218-891-2211
Marshall	Peterson, Maynard, Stephen	218-478-3859	R	Renville	Ziller Seed Company, Inc., Bird Island	320-365-3674
Marshall	Philipp, D. Joe, Goodridge	218-681-5574	C	McVey		
Marshall	Robertson Brothers, Argyle	218-437-6411	R	Kittson	Bloomquist Farms, Inc., Drayton	218-455-3863 R C
Meeker	Smith, Steven, Darwin	320-693-6769	C	Marshall	Peterson, Maynard, Stephen	218-478-3859 R
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C	Nora		
Norman	Brandt, Robert Jr., Ada	218-784-4093	C	Polk	Capistran Seed Company, Crookston	218-281-7840
Norman	Hanson, Corey M., Gary	218-356-8678	C	Norpro		
Otter Tail	Brenden, Bruce L., Rothsay	218-867-2410	C	Clay	Lee Seed Farm, Borup	218-494-3330
Out of state	Anderson, Gerald D, Grand Forks	701-775-8766	C	Clay	Petermann Seeds, Inc., Hawley	218-483-3302
Pennington	Scholin Farms, Thief River Falls	218-964-5268	R C	Grant	Thiel Seed Service, Wendell	218-458-2415
Pennington	Swanson, Curtis W., Thief River Falls	218-964-5619	C	Kittson	Hunter, Daniel, Lancaster	218-762-5331
Pennington	Trontvet, Daniel, Thief River Falls	218-681-4028	C	Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631
Polk	Amiot, Regis, Crookston	218-281-1255	C	Lincoln	Lincoln County Feed & Seed, Ivanhoe	507-694-1243
Polk	Anderson Farms, Inc., J D, East Grand Forks	218-773-2280	C	Polk	Capistran Seed Company, Crookston	218-281-7840
Polk	Balstad, Scott, Fosston	218-435-6311	C	Polk	Ross Seed Co., Fisher	218-891-2211
Polk	Barrett, John M., East Grand Forks	218-773-0338	C	Roseau	Kukowski, Jim, Strathcona	218-781-2478
Polk	Bauer Farms, Erskine	218-687-5356	C	Wilkin	Beyer Seed Farm, Kent	218-643-5126
Polk	Brule, David A., Crookston	218-281-2944	C	Oxen		
Polk	Caillier, Daniel, Crookston	218-281-2840	C	Becker	Hein Farms, Inc., Audubon	218-439-6621 C
Polk	Capistran Seed Company, Crookston	218-281-7840	C	Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203 C
Polk	Clementson, Jon, Erskine	218-687-2345	R	Big Stone	Shannon, Michael B., Clinton	320-325-5380 C
Polk	Dufault, Tim, Crookston	218-281-1880	C	Clay	Arneson Farms, Hawley	218-483-4165 C
Polk	Egeland, Inc., John M., Fisher	218-893-2662	C	Clay	Brendemuhl, Inc., M-D, Moorhead	218-233-5192 C
Polk	Frisk, Dean, Crookston	218-281-1281	C	Clay	Hastings, Joseph, Felton	218-494-3935 C
Polk	H & J Farms, Inc., Warren	218-745-5018	C	Clay	Heartland Seeds, Moorhead	218-585-4621 C
Polk	Hanson, Paul M, Crookston	218-281-5898	C	Clay	Johnson, Brian M., Hawley	218-962-3316 C
Polk	Johnson, Myron J., East Grand Forks	218-773-1791	C	Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7206 C
Polk	Kasprick Farms, Angus	218-745-5016	C	Clay	Lee Seed Farm, Borup	218-494-3330 C
Polk	Kovar, Frank & Duane, East Grand Forks	218-773-9238	C	Clay	Olsgaard, Inc., Harold, Moorhead	218-585-4535 R
Polk	Larson Farms, Inc., Ralph, East Grand Forks	218-773-1463	C	Clay	Petermann Seeds, Inc., Hawley	218-483-3302 R C
Polk	Larson Farms, Jerry Larson, Climax	218-857-3345	R C	Clay	Peterson Farm, Sherwood E., Sabin	218-789-7378 C
Polk	Larson, Arlan Farms, Inc., Climax	218-857-2535	C	Clay	Thompson, Shane, Moorhead	218-236-6582 C
Polk	Mat - Co., Inc., Fosston	218-435-6667	R C	Clay	Valan, Orlen Jr., Moorhead	218-236-9479 C
Polk	Novacek, Ronald, East Grand Forks	218-773-2293	C	Clay	West Central Ag Service, Ulen	218-596-8821 C
Polk	Novak, James, Angus	218-745-5048	C	Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339 C
Polk	Ostenaa, Sidney & DeWayne, Mc Intosh	218-563-7395	C	Clay	Zimmerman, Wayne, Ulen	218-596-8628 C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	R C	Douglas	Sward Seed Farm, Nelson	320-762-0143 C
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R C	Douglas	Thompson Farms, Kensington	320-965-2486 C
Polk	Ross Seed Co., Fisher	218-891-2211	C	Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161 C
Polk	Ross, Kevin, Joel & Jay, Fisher	218-281-2835	C	Grant	Adams Seed, Wendell	218-458-2151 C
Polk	Thompson Bros. Farms, LLP (David & Kevin) East Grand Forks	218-773-2251	C	Grant	Backman Seeds, Inc., Herman	320-677-2231 C
Polk	Thorson Farm, Inc., J. O., East Grand Forks	218-893-2285	R C	Grant	Backman, Tim, Herman	320-677-2785 R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R C	Grant	Biss, Larry, Wendell	218-458-2205 R C
Redwood	Sawvell's Seed, Inc., Clements	507-692-2240	C	Grant	Kapphahn, John M., Elbow Lake	218-685-4604 C
Roseau	Kukowski, Jim, Strathcona	218-781-2478	R	Grant	Kjesbo, Noel J., Wendell	320-284-2226 C
Stevens	Haberer Seed Farm, Morris	320-795-2468	C	Grant	Red River Marketing Co., Elbow Lake	218-685-6100 R C
Todd	Faust, Kevin, Long Prairie	320-732-3361	C	Grant	Thiel Seed Service, Wendell	218-458-2415 C
Traverse	Johnson, Merton, Wheaton	320-563-8025	R	Grant	Westrom, Chad B., Elbow Lake	218-685-4232 R C
Traverse	Triple E Farms, Inc. (Petersen, Alan), Wheaton	320-563-4239	C	Grant	Behm Seed Company, Atwater	320-974-3003 R C
Wilkin	Friederichs Farm, Foxhome	218-643-2363	R	Kandiyohi	Loge, Alan, Willmar	320-235-4178 C
Wilkin	Klindt, Neal, Campbell	218-630-5511	C	Lac qui Parle	Buer, Reid, Canby	507-223-7946 C
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C	Lac qui Parle	Hermanson Seed Plant, Boyd	320-855-2582 C
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	R C	Lac qui Parle	Kemen, Robert & Sons, Madison	320-769-4413 R C
Wilkin	Nordick, J & R, Rothsay	218-867-2605	C	Lac qui Parle	Olson, Jeffrey, Madison	320-752-4422 C
Wilkin	Steenblock Farms, Dale, Campbell	218-630-5500	C			
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C			

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Lake of the Woods	Helmstetter Farm, Roosevelt	218-442-7285	R C	Marshall	Riopelle, Earl & Brent, Argyle	218-437-8291	C
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C	Marshall	Riopelle, Larry, Argyle	218-437-8247	R
Lincoln	Jerzak, John, Ivanhoe	507-694-1834	C	Marshall	Rivard's Quality Seeds, Inc., Argyle	218-437-6638	R
Lyon County	Olson, Jonathan, Cottonwood	507-423-6340	C	Pennington	Engelstad Farms of Rocksbury, Thief River Falls	218-681-1000	C
Mahnomen	McNamee, Daniel, Mahnomen	218-935-2391	C	Pennington	Swanson, Curtis W., Thief River Falls	218-964-5619	C
Marshall	Anvinson, Chad, Oslo	218-695-3583	C	Polk	Kovar, Frank & Duane, East Grand Forks	218-773-9238	C
Marshall	Baird Farms, Inc., Warren	218-745-5330	C	Polk	Peterson, D.W., Inc., Warren	218-745-4507	R C
Marshall	Jensen Farms, Stephen	218-478-3398	R C	Polk	Ross Seed Co., Fisher	218-891-2211	
Marshall	Peterson, Maynard, Stephen	218-478-3859	R	Polk	Thorson Farm, Inc., J. O., East Grand Forks	218-893-2285	C
McLeod	Thalmann Seeds Inc., Plato	320-238-2185	C	Red Lake	Hinrichs, Roger, Red Lake Falls	218-253-2295	C
Meeker	Anderson Seeds, Dassel	320-286-2700	C	Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C	Red Lake	Vatthauer Farm, Red Lake Falls	218-253-2490	C
Meeker	Miller Seed Farm, Dassel	320-275-2463	R C	Roseau	Cenex Harvest States		
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C		Salol Elevator (Greenbush), Greenbush	218-782-2111	C
Norman	Chisholm, Keith P., Gary	218-356-8674	R C	Wilkin	Jerger, Manuel & Sons Farm, Barnesville	218-493-4262	C
Norman	Circle C Seeds, Gary	218-356-8214	C	Wilkin	Klindt, Neal, Campbell	218-630-5311	C
Norman	Hanson, Corey M., Gary	218-356-8678	C	Wilkin	Steenblock Farms, Dale, Campbell	218-630-5500	C
Norman	Kurpius, Roger J., Gary	218-356-8280	C				
Norman	Peppel Bros. Donald & Dennis, Borup	218-582-3242	C	Reeder			
Otter Tail	Walkup, John, Campbell	218-739-2580	C	Clay	Heartland Seeds, Moorhead	218-585-4621	C
Polk	Balstad, Scott, Fosston	218-435-6311	C	Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C
Polk	Bauer Farms, Erskine	218-687-5356	C	Marshall	Farmers Elevator Company, Alvarado	218-965-4812	C
Polk	Clementson, Jon, Erskine	218-687-2345	R C	Marshall	Field Brothers Farms, Inc., Stephen	218-478-3308	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C	Marshall	Gajeski, Gene & Rick, Stephen	218-478-2749	C
Polk	Frisk, Dean, Crookston	218-281-1281	C	Marshall	Gostanzik, Stan, Argyle	218-437-8149	R
Polk	Larson, Arlan Farms, Inc., Climax	218-857-2535	C	Marshall	Jensen Farms, Stephen	218-478-3398	R C
Polk	Mat - Co., Inc., Fosston	218-435-6667	R C	Marshall	Peterson, John C., Stephen	218-478-3555	C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	C	Marshall	Peterson, Maynard, Stephen	218-478-3859	C
Polk	Sonstelic, Gordon & Gary, Winger	218-938-4189	C	Marshall	Riopelle, Larry, Argyle	218-437-8247	R
Polk	Vig Farms Inc., Fosston	218-435-1316	R C	Norman	Brandt, Wayne G. & John, Ada	218-794-4774	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R	Norman	Chisholm, Keith P., Gary	218-356-8674	R C
Redwood	Sawwell's Seed, Inc., Clements	507-692-2240	C	Norman	Sirjord Farms, Bejou	218-356-8285	C
Roseau	Cenex Harvest States			Pennington	Asp, Kenneth, Thief River Falls	218-681-3272	C
	Salol Elevator (Greenbush), Greenbush	218-782-2111	C	Polk	Capistran Seed Company, Crookston	218-281-7840	
Roseau	Habstritt Farms, Inc., Roseau	218-463-1193	C	Polk	Peterson, D.W., Inc., Warren	218-745-4507	R C
Roseau	Kukowski, Jim, Strathcona	218-781-2478	R	Polk	Peterson, Douglas, East Grand Forks	218-773-9120	C
Scott	Hauer Farms, Inc., Shakopee	952-445-7554	C	Polk	Stroble, D & K, Angus	218-745-4473	C
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C	Polk	Tiedemann, Gene E., Euclid	218-281-6723	C
Stevens	Haberer Seed Farm, Morris	320-795-2468	C	Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R C
Swift	Busse Seeds, Appleton	320-394-2315	R C	Roseau	Cenex Harvest States		
Swift	Falk Seed Farm, Murdock	320-875-4341	R C		Salol Elevator (Greenbush), Greenbush	218-782-2111	C
Swift	Lee's Seed Farm, Benson	320-843-2857	C	Roseau	Cenex Harvest States		
Traverse	Lundquist Seed, Inc., Wheaton	320-563-8622	C		Salol Elevators (Roseau), Roseau	218-463-1955	R
Traverse	Lundquist, Gene, Wheaton	320-563-8644	C	Russ			
Traverse	Rinke, David, Wheaton	320-563-4864	C	Marshall	Circle M, Warren	218-745-5610	C
Wilkin	Beyer Seed Farm, Kent	218-643-5126	R C	Marshall	Yutzenka, Don and Mack, Argyle	218-437-8428	C
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	R C	Pennington	Asp, Kenneth, Thief River Falls	218-681-3272	C
Wilkin	Klindt, Neal, Campbell	218-630-5511	C	Polk	Clementson, Jon, Erskine	218-687-2345	R C
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C	Polk	Peterson, D.W., Inc., Warren	218-745-4507	C
Wilkin	Korinek, John, Campbell	218-643-2571	C	Roseau	Cenex Harvest States		
Wilkin	Nordick, J & R, Rothsay	218-857-2605	C		Salol Elevator (Greenbush), Greenbush	218-782-2111	C
Wilkin	Steenblock Farms, Dale, Campbell	218-630-5500	C	Verde			
Wright	Hopkins, Joseph, Buffalo	763-682-1868	C	Mahnomen	Noll, Pat, Mahnomen	218-935-2931	C
Wright	Yerning Seeds, Inc., Cohato	320-286-2168	C	Marshall	Hoke, Steven, Gorygla	218-294-6537	C
Yellow Medicine	Antony, David N., Porter	507-223-7144	R	Marshall	Nes on Farm c/o Doyle, Goodridge	218-681-6972	R
				Roseau	Cenex Harvest States		
					Salol Elevator (Greenbush), Greenbush	218-782-2111	C
Parshall				Walworth			
Clay	Petermann Seeds, Inc., Hawley	218-483-3302	R C	Big Stone	Clinton Ag Service, Inc., Clinton	320-325-2093	R
Clay	Zimmerman, Wayne, Ulen	218-596-8628	C	Big Stone	Jahnke Farms, Johnson	320-748-7667	R
Grant	Red River Marketing Co., Elbow Lake	218-685-6100	C	Clay	Pearson, Karol G., Georgetown	218-861-6668	R
Kittson	Carlson, James A., Hallock	218-843-3483	C	Clay	Tande, Harman, Moorhead	218-287-3977	R
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C	Grant	Adams Seed, Wendell	218-458-2151	R
Marshall	Circle M, Warren	218-745-5610	C	Grant	Red River Marketing Co., Elbow Lake	218-685-6100	R
Marshall	Elseñ, Elden & Robert, Warren	218-745-6515	C	Norman	Chisholm, Keith P., Gary	218-356-8674	R
Marshall	Gryskiewicz, Donald & Jeff, Stephen	218-437-8164	C	Otter Tail	Walkup, John, Campbell	218-739-2580	R
Marshall	McGlynn, Neil, Stephen	218-478-2777	C	Polk	Thorson Farm, Inc., J. O., East Grand Forks	218-893-2285	R
Marshall	Peterson, John C., Stephen	218-478-3555	C				

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Traverse	Rinke, David, Wheaton	320-563-4864	R
Wilkin	Beyer Seed Farm, Kent	218-643-5126	R
Wilkin	Friederichs Farm, Foxhome	218-643-2363	R
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	R
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	R
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	R

WHITE CLOVER

Will Landino

Roseau	Slater, Gary, Roseau	218-463-1064	
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WILDRICE

Petrowske Purple

Polk	Gunvalson Farms, Trail	218-268-4415	C
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WINTER WHEAT

Arapahoe

Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
McLeod	Thalman Seeds Inc., Plato	320-238-2185	C

Crimson

Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
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Harding

Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	C

Seward

Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	R
Scott	Hauer Farms, Inc., Shakopee	952-445-7554	C

Forage, grass, oilseed and small-grain organizations

These organizations work in many ways in support of the commodities they represent and to provide information to the public and opportunities to their members. Contact them directly for specific information about their roles and services.

Minnesota Association of Wheat Growers and Minnesota Wheat Research and Promotion Council
2600 Wheat Drive
Red Lake Falls, MN 56750
Phone: 218-253-4311
Fax: 218-253-4320
E-mail: mnwheat@gvtel.com
Web Address: www.smallgrains.org

Minnesota Approved Seed Conditioners and Marketing Association
P.O. Box 303, Argyle, MN 56713
Phone: 218-437-6638
Fax: 218-437-6392

Minnesota Canola Council
4630 Churchill St., Suite 1
St. Paul, MN 55126
Phone: 651-638-9883
Fax: 651-638-0756
E-mail: mncanola@aol.com

Minnesota Barley Growers Association and Minnesota Barley Research and Promotion Council
2601 Wheat Drive
Red Lake Falls, MN 56750
Phone: 218-253-4311
Fax: 218-253-4320
E-mail: mnbarley@gvtel.com

Minnesota Corn Growers Association and Minnesota Corn Research and Promotion Council
738 First Avenue East
Shakopee, MN 55379
Phone: 952-233-0333
Fax: 952-233-0420
E-mail: info@mncorn.org
Web Address: www.mncorn.org

Minnesota Crop Improvement Association
1900 Hendon Avenue
St. Paul, MN 55108
Phone: 612-625-7766
Fax: 612-625-3748
E-mail: beilx001@tc.umn.edu
Web Address: http://www.mncia.org

Minnesota Forage and Grassland Council
411 Borlaug Hall
1991 Buford Circle
St. Paul, MN 55108
Phone: 651-436-3930
Fax: 651-436-7210
E-mail: mfgc@tc.umn.edu

Minnesota Soybean Growers Association and Minnesota Soybean Research and Promotion Council
360 Pierce Avenue
Suite #110
North Mankato, MN 56003
Phone: 507-388-1635
Fax: 507-388-6751
Web address: http://www.mnsoybean.org

Northern Minnesota Bluegrass Growers Association
31154 430th Avenue
Roseau, MN 56751-8413
Phone 218-463-2119

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	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	10	50/sq. ft.	Early spring or summer
Tall fescue, in mixtures	—	—	4	20/sq. ft.	Use date for legumes
Timothy in mixtures	45	1,234,000	3	85/sq. ft.	Use date for legumes
Forage legumes, perennial					
Alfalfa alone	60	220,000	11	55/sq. ft.	Early spring, late summer
Alfalfa with grass	—	—	7	35/sq. ft.	Early spring, late summer
Alsike clover in mixtures	60	553,000	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	16	50/sq. ft.	Early spring or summer
Ladino clover in mixtures	60	784,000	1	18/sq. ft.	Early spring to August 10
Red clover alone	60	272,000	9	50/sq. ft.	Early Spring to September 1
Red clover with grass	—	—	5	30/sq. ft.	Use date for legume
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
Sorghum, rows 6 to 14 in.	—	—	15	5/sq. ft.	—
Soybean, 7-in. rows	60	2,800	56	27/sq. ft.	May 1 to May 10
10-inch rows	—	—	—	37/sq. ft.	—
20-in. rows	—	—	—	67/sq. ft.	—
22-in. rows	—	—	—	77/sq. ft.	—
30-in. rows	—	—	—	97/sq. ft.	—
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	—	14,000	113	28/sq. ft.	Early spring
Wheat, hard red winter	—	14,500	75+	25/sq. ft.	August/Sept 20
Other crops					
Annual canarygrass	50	58,000	30	40/sq. ft.	Early spring
Buckwheat	48	14,900	50	17/sq. ft.	June 15/July 20
Canola, <i>B. napus</i>	50	80,000 to 160,000	3 to 7	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 1 1/2 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	—	—	80	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	10	25/sq. ft.	May 20/June 10
Sudangrass, rows 18 to 40 in.	—	—	20	20/sq. ft.	May 20/June 10
Sweetclover	60	240,000	18	55/sq. ft.	Early spring
Wildrice (wet)	25	7,900	33	6/sq. ft.	Late fall

¹ U.S. legal bushel weight or, if not established, the weight most widely accepted. ² See page 47 for best way to calculate hard red spring wheat planting rate.



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1420 Eckles Avenue
St. Paul, Minnesota 55108-6056

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