



Minnesota

VARIETAL TRIALS RESULTS

MP 105-2001 January 2001

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

CONTENTS

MINNESOTA VARIETAL TRIALS RESULTS

| | |
|---|----------|
| Introduction and Explanations..... | page 8 |
| Forage Crops | |
| Alfalfa | page 10 |
| Birdsfoot Trefoil..... | page 28 |
| Bromegrass | page 28 |
| Cicer Milkvetch | page 29 |
| Orchardgrass | page 29 |
| Red Clover | page 30 |
| Reed Canarygrass..... | page 30 |
| Tall Fescue..... | page 31 |
| Timothy..... | page 32 |
| Grain Crops | |
| Barley..... | page 33 |
| Corn, Grain..... | page 35 |
| Corn, Silage..... | page 46 |
| Oat..... | page 48 |
| Wheat, Hard Red Spring | page 51 |
| Wheat, Hard Red Winter | page 55 |
| Wildrice..... | page 57 |
| Oilseed Crops | |
| Canola | page 58 |
| Soybean | page 71 |
| Sources of Certified Seed and Seed Conditioning | |
| MCIA Registered and Certified Seed Grower Listing | page 92 |
| MASCMA Member Seed Conditioning Plants..... | page 102 |
| Rate and Date of Planting Table | page 103 |

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The University of Minnesota's Research and Outreach Centers



Nearly all of the plot work of the early hybrid corn-breeding program at the University of Minnesota was carried out at Waseca; about 10,000 plots covered some 40 acres. Today special plot-harvesting equipment reduces labor and speeds harvest of corn evaluation plots at the Waseca Center.

This issue of *Varietal Trials of Farm Crops* is made possible through close collaboration among the University of Minnesota Agricultural Experiment Station in St. Paul and outlying research stations. Initially focused on research in farm crops and livestock, the stations at Crookston, Grand Rapids, Lamberton, Morris, Rosemount and Waseca, known since 1998 as Research and Outreach Centers, have become Greater Minnesota's link to the University's academic programs.

Today the research and outreach work at these Centers focuses mainly on five areas:

1. Developing new crops, products and processes.
2. Increasing the scope and usefulness of programs to meet the needs of Minnesota farms of different sizes, structures and practices.
3. Identifying and examining appropriate changes in agriculture, agribusiness and rural businesses that can help people make sound decisions about their communities.
4. Improving the quality of life for rural, urban and suburban people.
5. Enhancing the profitability and national and global competitiveness of Minnesota's farms and other natural resource industries.

Faculty and staff of each Outreach Center collaborate extensively with their colleagues on the St. Paul campus, the Minnesota Extension Service, and state and federal agencies.

Southern Research And Outreach Center – Waseca

The Center at Waseca, with 970 acres and a faculty and staff of 54, provides research-based information to 24 counties



Tests for soybean cyst nematode (SCN) are performed in the nematology laboratory at the Waseca Center. Along with confirming SCN presence, the test provides an estimate of cyst nematode population densities. Cathy Johnson operates an elutriator, which washes nematode eggs from soil samples. Information on the test is available at county extension offices or toll-free from the SCN Coalition, 1-877-726-8378

in south-central and southeastern Minnesota. The work at Waseca includes:

- Production and technology development for major agronomic crops on a site-specific basis, with significant research at off-station locations. This work includes hybrid and variety performance evaluation, weed, disease and insect management, and tillage practice and fertility application studies.

- Animal production technology for swine and dairy, with major emphasis on reducing odor and nutrient levels of manure at stable and/or increased economic efficiencies.

- Environmental management research related to ground and surface water quality. Approaches include fertility and pesticide management, use of wetland to mitigate water quality, and improved standards for valuation of wetland classes. Low-maintenance landscape and turf-grass evaluation sites for rural and urban settings have been expanded to include visual and air quality improvement for livestock confinement buildings.

- Water management research and education focused on a 200-acre non-tiled site with 30 acres of Class I, II and III wetlands. This project includes the impacts of drainage on water quality and

nitrogen management, economic assessment of drainage, aging drainage systems and how urban drainage affects water quality.

- Integrated animal waste-management research and education with emphasis on confinement sites and odor and nutrient reduction by improved storage, handling and application techniques. Solid-liquid separation, rapid nutrient testing equipment and improved application equipment are emphasized.

Southwest Research And Outreach Center – Lamberton

The Center at Lamberton, with 828 acres and a faculty and support staff of 29, partners with Southwest State University (SSU), Marshall, to deliver University of Minnesota agricultural degrees on the SSU campus.

The Lamberton Center's contributions to research and outreach include:

- Production and management technology for corn and soybeans, including variety trials, fertilizer management, and tillage and rotational practices.



Corn and soybean work is a major research emphasis at the Lamberton Center, where crop studies focus on yield, grain quality, maturity and pest resistance. Crops research at Lamberton includes work with alfalfa, small grains, food-grade soybeans and many alternative crops for southwest Minnesota, such as buckwheat sunflower and vegetables. Plant breeder Lori Falkner (photo) combines work at the Lamberton Center with teaching at Southwest State University, Marshall.

- Small-plot trials of seed, disease, and insect management practices, and studies on the environmental implications of pesticides.

- Small grain production and technology studies, which include variety and crop-management trials of alfalfa, wheat, oats and flax.

- Research on crop rotations, mechanical weed control, value-added niche markets, cover crops and green manures to identify organic and alternative management strategies for sustainable production systems.

- Environmental management and protection studies related to crop production and the interaction among ground water, surface water and soil management, including tillage, drainage, fertilization, erosion and runoff.

West Central Research And Outreach Center – Morris

The Morris Center has 1,000 acres and 43 faculty and support staff working with farmers and rural leaders to provide research and educational programming blending economics with biological, physical, and social science. Research and education is focused on forage-based



Crop breeding and management programs at the Morris Center are conducted for soybean, corn, barley, oat and wheat; research emphasis is on weed-management strategies for soybean, corn and wheat. Management studies on precision agriculture and manure management are also emphasized here.

livestock systems, swine production systems and environmental management of crop/livestock agricultural systems.

Research and outreach at the Morris Center includes:

- Intensively managed livestock grazing and forage-based production systems.

- The effects of integrated crop/livestock production systems on surface-water quality.

- Conventional and alternative swine production systems.

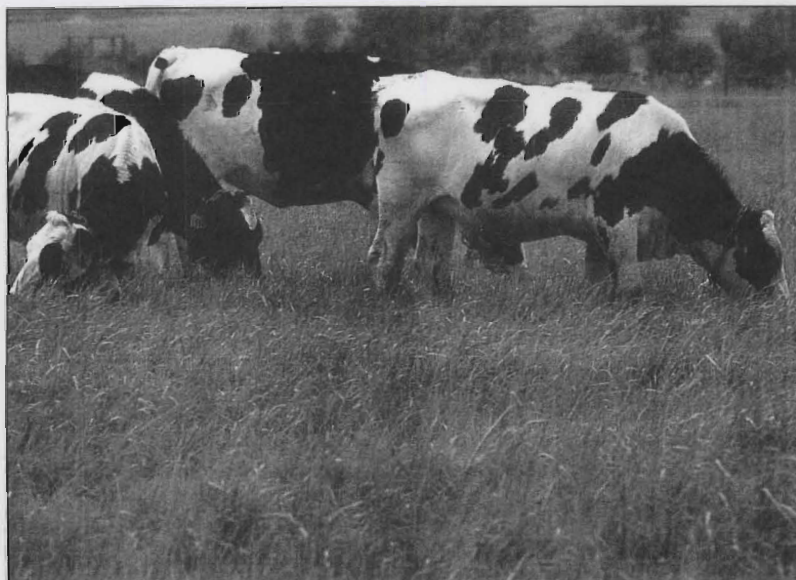
- Sustainable dairy production systems for modest-size family operations.

- Social and economic impacts of agricultural trends on farm families and rural communities.

- Optimum management practices for profitable and environmentally responsible cropping systems.

- Field crop varietal, fertility and pest-management evaluation.

- Environmental horticulture evaluation of floral selections, fruits, trees, shrubs and ornamental grasses.



The Morris Center's dairy program concentrates on information needs of modest-sized dairy farms. Emphasis includes the impact of management-intensive grazing systems.

Northwest Research And Outreach Center – Crookston

The Center at Crookston is a diversified crop, livestock and natural resource research facility with 1,500 acres owned and 350 acres rented, and 39 faculty and support staff. Programs at the Crookston Center are focused on 10 crops and 2 livestock species and their interaction



Wheat and barley research programs at Crookston are heavily weighted toward control of Fusarium head blight (scab) through plant breeding and chemical and cultural measures. Jochum Wiersma (photo) is the small-grains specialist at the Crookston Center.

with the environment. Other research and outreach activities include:

- Wheat and barley research, including varietal development and performance testing, nutrient management, tillage, disease, insect and weed control, plant physiology and best management practices. Programs are heavily weighted to the control of Fusarium head blight (scab) through plant breeding and chemical and cultural measures.
- Statewide responsibilities for sugarbeet research in disease, nutrient, insect and cultural management problems. Present research priorities are the control of Aphanomyces root rot and Cercospora leaf spot, and using site-specific technology to reduce nitrogen fertilizer use on sugarbeet and crops that follow it in the rotation.
- Crookston is the dry-land site for Minnesota and North Dakota potato research programs. The major focus is on disease and insect problems endangering the economic variability and future of

the Minnesota seed- and market-potato industry.

- Crookston is the primary site for feedlot research on nutrition, growth promotants and carcass quality; the major

focus is on use of protein sources from soybean or alfalfa leaf meal.

- Integrated prairie management research centers on the effects of burning and grazing on prairie plant composition, productivity of prairie plants, livestock production, prairie bird populations and water quality.

North Central Research And Outreach Center – Grand Rapids

The Center at Grand Rapids has 873 acres of sandy loam soil and a faculty and support staff of 36. Together with traditional crop and livestock research, scientists here conduct research in agricultural engineering, environmental issues, forestry, industrial by-product utilization, horticulture, mycoherbicides, tourism and travel, rural economic development and wild rice.

In 1999 the Itasca County Extension Service became a part of the Grand Rapids campus.

Grand Rapids has become the center for beef cow/calf research, and beef/forage research has been developed on a 200-acre site five miles south of the main



Forage research in 2000 at the Grand Rapids Center included variety evaluation of alfalfa, birdsfoot trefoil, cicer milkvetch, orchardgrass, red clover, reed canarygrass, tall fescue and timothy. The Center's cow-calf herd has more than 200 cows; capacity for calving is 210. Russell Mathison (photo) is agronomist at the Center.

campus. Other research at the Center includes:

- Evaluation of legume and grass species and mixtures for grazing and stored-forage production.
- Forest management, economics and genetics.
- Management systems for the production of small fruit and vegetable crops.
- Tourism and rural economic development research and outreach.
- Wildrice breeding, management and disease control.

Rosemount Research and Outreach Center

The Center at Rosemount has a faculty and staff of 11. This Center, somewhat of an extension of the St. Paul Campus for crops and livestock research, has major plant and soil science research priorities. Project leadership is provided from the St. Paul Campus.

Poultry and swine research facilities and the feed mill are managed by the Animal Science Department. The College of



Corn harvest, fall 2000, at the 3,500-acre Rosemount Research and Outreach Center.

Veterinary Medicine operates a goat, swine and horse research facility here.

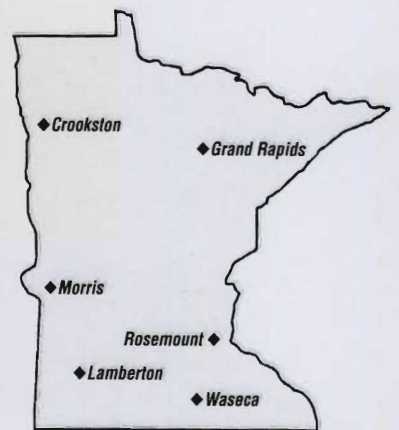
The 3,500-acre Rosemount Center offers unique opportunities for plot isolation and larger-than-usual-plot-size research. It has the potential for irrigation

research and for special rural-urban research of value to both communities.

Several mission-related research activities centered on agriculture, food and the environment are in various stages of implementation.



The large acreage available for research at the Rosemount Center enables weed control researchers to plant field crops across large, uniform weed areas. Here test material can be evaluated for control efficiency in an environment similar to that of farmers' fields.



University of Minnesota Research and Outreach Center Locations.

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 *Varietal Trials of Farm Crops* are not included in 2000 performance trials. Questions about them can be addressed to the logical individual listed under the "Authors and Researchers" heading on page 9.

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 92.

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.

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 used for agricultural experiment station.

In Appreciation

The Minnesota Agricultural Experiment Station is grateful for generous financial contributions by the Minnesota Approved Seed Conditioners and Marketing Association and the Minnesota Seed Producers and Promotion Association, which aided greatly in the production and distribution of this edition of *Varietal Trials of Farm Crops*. The Station also appreciates the cooperation of the Minnesota Barley Growers Association and Minnesota Barley Council, Minnesota Forage and Grassland 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 the Minnesota Association of Wheat Growers and Minnesota Wheat Council in the distribution of this publication, and the Minnesota Crop Improvement Association's assistance with its coordination and distribution.

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Wildrice: R.A. Porter.

Information on the reaction of crop varieties to specific pathogens was obtained mainly by J.E. Kurle and R. Dill-Macky, Department of Plant Pathology; D.V. McVey and G. Ochocki, USDA-ARS Cereal Disease Laboratory, and F. Kolb, University of Illinois - Urbana.

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J.E. Kurle is a research plant pathologist at the University of Minnesota. Agronomists and plant pathologists at the Minnesota Agricultural Experiment Station have cooperated in crops research since the early 1900s. This cooperative endeavor has been invaluable in the development of disease-resistant varieties of farm crops suitable to Minnesota.



FORAGE CROPS



Locations of Alfalfa Trials.

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, alternate years at a southeastern site, Lamberton, Morris, a Stearns County site, Crookston and Grand Rapids. 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: Rosemount and Waseca (replaced by Lewiston in 1996, Plainview/Potsdam in 1998) in southeastern, Lamberton in southwestern, Morris in west central, Stearns County (St. Martin, Melrose) since 1998 in central, Crookston in northwestern and Grand Rapids in northeastern Minnesota (see Locations map above). Varieties of alfalfa are tested for winter survival and forage quality at selected experiment stations of the Universities of Minnesota and Wisconsin.

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

eties approved for seed certification will be marketed in Minnesota for the next seeding year. The varieties reported in those responses are listed on pages 22-25; each variety is keyed to distributors' addresses and phone numbers on pages 26-27. Varieties seeded in past or present Minnesota yield trials are included on

ALFALFA

pages 12-19, those with winter survival or forage quality performance data are listed on pages 20-21.

Winterhardiness

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 area also experience frequent severe winters. 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.

Winter Survival

Winter survival 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), page 20. The WSI was averaged over all test locations to provide a robust estimate of winter survival and is presented beside

yield data on pages 12-19. Varieties are rated from Superior to Adequate 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. Varieties tested to date are 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 22-25, 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

Alfalfa yields are presented in an enhanced format, different from previous reports. Greater confidence should be



placed in data that include three or more tests. To indicate which data have fewer tests, each yield number is formatted to show how many tests it represents. Data in bold type represent three or more tests, data in regular type represent two tests, and data in italic type represent only one test. Each seeding at any location is a "test".

Varieties are ranked first by the average of year 1 and year 2 yields, then by year 3 yield, then by year 1 yield. Results are presented in two parts, 1) a summary over all locations and a summary of southeastern sites, and 2) a summary over all locations and individual location data for the west-central, central and northeast sites. Yield is expressed as a percent of the average of check varieties identified in each table.

Varietal differences in yield tend not to be as great the first two years after seeding as with older stands. Thus, to choose a variety for short-term stands, 1 to 2 years after seeding, use the all-location yield for 1+2 years after seeding. For long-term stands, choose varieties based on their performance over all locations 3 years after seeding. Note that varieties that have been seeded in fewer than 3 tests cannot yet be considered adequately characterized for yield performance.

Forage Quality

Alfalfa varieties differ in forage quality or feeding value. Alfalfa varieties have been evaluated for forage quality at Rosemount since 1991. An NAAIC Standardized Forage Quality Test has been performed at Arlington, Wis., and Rosemount, Minn., since 1995. Varieties in the seeding year are evaluated on one cut taken in 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.

Relative Feed Value (RFV) index ranks varieties on their potential digestible dry matter intake. Milk per ton is estimated using a variety's crude protein and neutral detergent fiber concentrations to determine the amount of alfalfa needed to match the protein and energy needs of a

1,350-pound cow producing 60 pounds of milk per day with a diet including corn grain and minerals. Milk per acre quantifies the forage quality of an alfalfa variety as "tons per acre" multiplied by "milk per ton" (theoretical milk production per ton, calculated from protein and fiber values).

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 22-25. 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 area 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, first found in Minnesota in 1978, has become more prevalent each year, but only in the east central and southeast area. It infects stems and crowns and kills susceptible plants. Because anthracnose is favored by hot, moist conditions it is 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 ensure long-life stands. Varieties having at least a low level of resistance are indicated on pages 22-25.

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.

The web version of this report is on the Minn. Agricultural Experiment Station website: www.maes.umn.edu/pubs.html.

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 southeastern sites.

(**Bold** yield numbers represent 3 or more tests; regular type, 2 tests, *Italic* type, only 1 test.)¹

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | |
|--|------------------|--|-------------|-------------|---------------------------------------|--------------------------------------|----------------------------------|-------------|-------------|
| | | All Sites | | | Test Sites ³ (Seedings) | Production ⁴ Years 1-3 | Rosemount-Southeast ⁵ | | |
| | | Yr 1 | Yr 1+2 | Yr 3 | | | Yr 1 | Yr 1+2 | Yr 3 |
| Checks, T/Ac 15%mc Hay | | 5.97 | 5.90 | 5.31 | 40 | 95 | 6.28 | 6.21 | 5.62 |
| Webfoot Supreme | - | <i>118</i> | <i>120</i> | - | 1 | 2 | <i>118</i> | <i>120</i> | - |
| Pasture Plus | - | <i>110</i> | <i>113</i> | - | 1 | 2 | <i>110</i> | <i>113</i> | - |
| Laser | - | 111 | 112 | <i>102</i> | 3 | 7 | <i>116</i> | <i>115</i> | <i>102</i> |
| Perfect | - | <i>115</i> | <i>112</i> | - | 1 | 2 | - | - | - |
| Persist | - | 110 | 112 | - | 7 | 13 | 108 | 112 | - |
| WinterMax | - | 111 | 111 | <i>105</i> | 2 | 5 | <i>110</i> | 111 | - |
| GH755 | - | 117 | 111 | <i>91</i> | 4 | 9 | 112 | 109 | <i>91</i> |
| MultiQueen | - | 117 | 111 | - | 3 | 5 | <i>104</i> | - | - |
| Paragon BR | - | 111 | <i>110</i> | <i>116</i> | 1 | 3 | <i>111</i> | <i>110</i> | <i>116</i> |
| Magnum III | - | 109 | 110 | 114 | 9 | 25 | 111 | 110 | 110 |
| GoldLeaf | 2.8 | <i>116</i> | <i>110</i> | <i>113</i> | 4 | 3 | <i>116</i> | <i>110</i> | <i>113</i> |
| 350 | 2.8 | 108 | 110 | <i>113</i> | 5 | 9 | 109 | 111 | <i>113</i> |
| Surpass | - | 110 | 110 | 108 | 5 | 10 | 112 | 112 | <i>107</i> |
| MagnaGraze | - | 111 | 110 | <i>101</i> | 2 | 5 | 111 | 110 | <i>101</i> |
| Quantum | - | 114 | 110 | <i>99</i> | 4 | 9 | 109 | 107 | <i>99</i> |
| Magnum III-Wet | - | 110 | 110 | <i>99</i> | 6 | 13 | 111 | 110 | <i>99</i> |
| 9326 | - | 108 | 110 | <i>98</i> | 7 | 12 | 111 | 112 | <i>98</i> |
| Root 66 | - | <i>107</i> | <i>110</i> | - | 1 | 2 | <i>107</i> | <i>110</i> | - |
| 6410 | 2.7 | 104 | 110 | - | 8 | 7 | 108 | 112 | - |
| Radiant | - | <i>108</i> | <i>109</i> | <i>117</i> | 1 | 3 | <i>108</i> | <i>109</i> | <i>117</i> |
| Magnum V | 3.0 | 105 | 109 | <i>112</i> | 10 | 18 | 105 | 106 | <i>112</i> |
| Imperial | - | 107 | 109 | 107 | 7 | 14 | 106 | 110 | 107 |
| Abundance | - | 106 | 109 | <i>107</i> | 3 | 5 | 106 | 109 | <i>107</i> |
| Voyager II | - | 109 | 109 | 104 | 7 | 16 | 108 | 109 | <i>101</i> |
| Monument | - | 106 | 109 | <i>102</i> | 4 | 9 | 106 | 109 | - |
| Magnum IV | - | 109 | 109 | <i>100</i> | 4 | 9 | 109 | 107 | <i>100</i> |
| Rebound 4.2 | 2.4 | 108 | 109 | - | 5 | 7 | <i>108</i> | - | - |
| Target II Plus | - | 109 | 108 | <i>117</i> | 3 | 7 | 111 | 109 | <i>117</i> |
| Harvstar 812HY | - | <i>110</i> | <i>108</i> | <i>111</i> | 1 | 3 | <i>110</i> | <i>108</i> | <i>111</i> |
| 631 | - | 108 | 108 | 109 | 12 | 26 | 108 | 107 | 109 |
| Gateway | - | 111 | 108 | <i>108</i> | 3 | 7 | 110 | 107 | <i>108</i> |
| Prolific | - | <i>108</i> | <i>108</i> | <i>107</i> | 1 | 3 | <i>108</i> | <i>108</i> | <i>107</i> |
| 620 | 2.5 | 108 | 108 | 106 | 17 | 33 | 107 | 108 | 107 |
| WL 324 | - | 107 | 108 | 105 | 6 | 14 | 106 | 109 | <i>118</i> |
| 2444 | - | <i>107</i> | <i>108</i> | <i>103</i> | 2 | 6 | - | - | - |
| FQ315 | - | 109 | 108 | <i>100</i> | 4 | 7 | <i>107</i> | <i>107</i> | <i>100</i> |
| Extend | 2.9 | 108 | 108 | 99 | 3 | 8 | 106 | 108 | <i>101</i> |
| BigHorn | 3.1 | 107 | 108 | 97 | 4 | 10 | 106 | 105 | 97 |
| WL 325 HQ | - | 107 | 108 | 94 | 6 | 13 | 108 | 110 | - |
| Geneva | 2.8 | 107 | 108 | - | 6 | 10 | 107 | 110 | - |
| Spirit | - | 106 | 108 | - | 4 | 7 | 107 | <i>114</i> | - |
| A4230 | - | <i>108</i> | <i>107</i> | <i>117</i> | 2 | 3 | <i>108</i> | <i>107</i> | <i>117</i> |
| Jade II | - | 106 | 107 | <i>109</i> | 4 | 8 | 105 | 107 | - |
| 630 | - | 105 | 107 | 109 | 11 | 29 | 107 | 110 | 113 |

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 1996-2000 trials. ³ Locations: Rosemount-Southeast (Waseca/Lawiston/Plainview), Morris-Crookston-Stearns County, Lambertson, Grand Rapids. ⁴ Total production years (after seed year) for any location with reliable data. Year 1+2 averages 2 production years. Seed years or production years that winterkilled or developed unacceptably variable stands are excluded. ⁵ Seedings at Waseca were discontinued after 1994 and replaced by a Southeast site near Plainview.

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | |
|--|------------------|--|------------|------------|---------------------------------------|--------------------------------------|----------------------------------|------------|------------|
| | | All Sites | | | Test Sites ³ (Seedings) | Production ⁴ Years 1-3 | Rosemount-Southeast ⁵ | | |
| | | Yr 1 | Yr 1+2 | Yr 3 | | | Yr 1 | Yr 1+2 | Yr 3 |
| AlfaStar | - | 113 | 107 | 106 | 3 | 7 | 104 | 104 | 110 |
| Vitro | 2.6 | 108 | 107 | 106 | 4 | 10 | 108 | 109 | 102 |
| Baralfa 32 IQ | 3.0 | 108 | 107 | 105 | 4 | 9 | 102 | 103 | 105 |
| 5454 | 2.3 | 107 | 107 | 104 | 23 | 55 | 107 | 108 | 108 |
| Innovator+Z | 2.3 | 105 | 107 | 104 | 5 | 13 | 106 | 107 | 103 |
| Defiant | 2.3 | 108 | 107 | 102 | 5 | 12 | 107 | 108 | 104 |
| Green Feast | 2.9 | 111 | 107 | 101 | 1 | 3 | 111 | 107 | 101 |
| Milk River | - | 110 | 107 | - | 9 | 7 | 102 | - | - |
| FQ314 | 3.0 | 106 | 107 | - | 4 | 7 | 105 | 106 | - |
| Garst 645 | 2.8 | 107 | 106 | 114 | 13 | 32 | 106 | 106 | 104 |
| Trident II | - | 107 | 106 | 112 | 6 | 17 | 100 | 101 | 94 |
| Enhancer | - | 106 | 106 | 111 | 3 | 9 | 106 | 107 | 108 |
| Dominator | - | 107 | 106 | 108 | 4 | 9 | 109 | 108 | 108 |
| Bounty | - | 107 | 106 | 108 | 3 | 8 | 106 | 104 | 108 |
| DK142 | 2.9 | 106 | 106 | 108 | 2 | 6 | 106 | 106 | 108 |
| Notice | 2.6 | 106 | 106 | 104 | 3 | 9 | 104 | 104 | 103 |
| WinterStar | 2.4 | 107 | 106 | 102 | 7 | 18 | 106 | 104 | 103 |
| Evolution | - | 107 | 106 | 100 | 4 | 11 | 110 | 111 | 101 |
| Iroquois | - | 104 | 106 | 99 | 12 | 26 | 103 | 104 | 98 |
| DK140 | 2.8 | 106 | 106 | 98 | 10 | 21 | 105 | 106 | 103 |
| Aspen | 3.2 | 109 | 106 | 97 | 3 | 8 | 104 | 103 | 99 |
| Columbia 2000 | 3.1 | 107 | 106 | 97 | 6 | 13 | 106 | 106 | 101 |
| Rustler II | - | 108 | 106 | - | 3 | 6 | 106 | 104 | - |
| AmeriStand 201+Z | 2.0 | 104 | 106 | - | 7 | 12 | 105 | 108 | - |
| Platinum | - | 101 | 106 | - | 3 | 3 | 105 | 108 | - |
| 5312 | 3.0 | 105 | 105 | 105 | 15 | 35 | 106 | 108 | 110 |
| Breakout | 2.5 | 105 | 105 | 104 | 3 | 7 | 105 | 105 | - |
| Yielder | - | 100 | 105 | 104 | 2 | 5 | 100 | 105 | 104 |
| TMF 421 | - | 106 | 105 | 103 | 6 | 14 | 102 | 102 | 108 |
| Rainier | 2.9 | 105 | 105 | 103 | 7 | 17 | 106 | 105 | 103 |
| WinterKing | 2.5 | 106 | 105 | 102 | 7 | 16 | 105 | 104 | 107 |
| Avalanche+Z | 2.4 | 103 | 105 | 102 | 8 | 20 | 110 | 109 | 100 |
| A-395 | - | 107 | 105 | 101 | 5 | 11 | 105 | 105 | 101 |
| 329 | - | 112 | 105 | 100 | 3 | 8 | 112 | 107 | 100 |
| WinterGold | 2.6 | 106 | 105 | 99 | 4 | 7 | 102 | 103 | 99 |
| GH766 | - | 102 | 105 | 99 | 7 | 15 | 105 | 106 | 100 |
| DK124 | 2.8 | 104 | 105 | 98 | 13 | 16 | 105 | 104 | - |
| Forecast 3000 | - | 102 | 105 | - | 2 | 4 | - | - | - |
| A 30-06 | 1.9 | 97 | 105 | - | 4 | 3 | 106 | 110 | - |
| AmeriGraze 401+Z | - | 102 | 104 | 106 | 4 | 9 | 100 | 101 | 106 |
| Sterling | - | 106 | 104 | 105 | 4 | 12 | 105 | 102 | 104 |
| DK127 | 2.6 | 105 | 104 | 104 | 16 | 32 | 108 | 107 | 107 |
| WetLand | - | 105 | 104 | 102 | 6 | 12 | 104 | 104 | 102 |
| Wt. 232 HQ | 2.8 | 104 | 104 | 102 | 7 | 12 | 104 | 105 | 102 |
| Award | 3.3 | 105 | 104 | 101 | 7 | 14 | 106 | 103 | 101 |
| Viking 1 | 3.0 | 104 | 104 | 101 | 10 | 24 | 105 | 107 | 101 |
| Nemesis | - | 103 | 104 | 101 | 4 | 12 | 102 | 104 | 105 |
| GH757 | 3.1 | 103 | 104 | 101 | 2 | 5 | 103 | 104 | 101 |
| Affinity+Z | - | 102 | 104 | 100 | 3 | 8 | 100 | 104 | 101 |
| Ace | 3.1 | 102 | 104 | 99 | 4 | 9 | 96 | 101 | 99 |
| Mainstay | 2.7 | 103 | 104 | 97 | 4 | 10 | 103 | 104 | 97 |
| WinterGreen | 2.5 | 105 | 104 | 96 | 3 | 7 | 106 | 107 | - |

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

(**Bold** yield numbers represent 3 or more tests; regular type, 2 tests, *italic* type, only 1 test.)¹

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | |
|--|------------------|--|------------|------------|---------------------------------------|--------------------------------------|----------------------------------|------------|------------|
| | | All Sites | | | Test Sites ³ (Seedings) | Production ⁴ Years 1-3 | Rosemount-Southeast ⁵ | | |
| | | Yr 1 | Yr 1+2 | Yr 3 | | | Yr 1 | Yr 1+2 | Yr 3 |
| 53Q60 | 3.0 | 104 | 104 | <i>94</i> | 13 | 16 | 103 | 104 | - |
| Somerset | 2.2 | 102 | <i>104</i> | - | 5 | 3 | 102 | <i>104</i> | - |
| Reliance | - | <i>100</i> | <i>103</i> | <i>120</i> | 1 | 3 | <i>100</i> | <i>103</i> | <i>120</i> |
| Depend+EV | - | 106 | 103 | 114 | 4 | 9 | 105 | 103 | <i>98</i> |
| Feast+EV | 2.2 | 105 | 103 | 105 | 6 | 7 | 105 | <i>104</i> | - |
| Complete | 2.7 | 104 | 103 | 104 | 3 | 7 | 108 | <i>106</i> | <i>103</i> |
| Demand | - | 106 | 103 | 102 | 3 | 8 | 108 | 104 | <i>101</i> |
| GH767 | 3.0 | 105 | 103 | 102 | 4 | 11 | 105 | 103 | 102 |
| Blazer XL | 2.8 | 108 | 103 | 101 | 3 | 8 | <i>106</i> | <i>101</i> | - |
| Wrangler | - | 102 | 103 | 101 | 10 | 23 | 104 | 106 | 107 |
| DK141 | 3.4 | 106 | 103 | 98 | 10 | 21 | 104 | 104 | <i>103</i> |
| Legendairy 2.0 | 2.8 | 105 | 103 | 98 | 4 | 10 | 101 | 99 | 98 |
| Multi 5301 | - | 103 | 103 | <i>97</i> | 5 | 11 | 101 | 102 | <i>97</i> |
| Multiplier II | - | 105 | 103 | 96 | 5 | 12 | 104 | 101 | <i>96</i> |
| Legend Gold | - | 103 | <i>103</i> | <i>96</i> | 5 | 6 | 110 | <i>107</i> | <i>96</i> |
| Spur | - | 105 | 103 | - | 2 | 4 | 105 | 103 | - |
| Samurai | - | 103 | <i>103</i> | - | 2 | 3 | 103 | <i>103</i> | - |
| Pristine | - | 102 | 103 | - | 2 | 4 | 102 | 103 | - |
| Magnum V-Wet | - | <i>102</i> | <i>103</i> | - | 4 | 2 | <i>102</i> | <i>103</i> | - |
| Abound | - | 101 | <i>102</i> | <i>111</i> | 8 | 6 | 101 | <i>102</i> | 111 |
| Gold Plus | - | 102 | 102 | <i>109</i> | 4 | 9 | 99 | 101 | <i>109</i> |
| TMF Generation | - | 103 | 102 | 105 | 5 | 15 | 106 | 105 | 105 |
| WL 252 HQ | - | 94 | <i>102</i> | <i>105</i> | 3 | 6 | 106 | 108 | <i>105</i> |
| Passport | - | <i>104</i> | 102 | <i>104</i> | 1 | 3 | <i>104</i> | <i>102</i> | <i>104</i> |
| Oneida (check) | - | 104 | 102 | 104 | 8 | 21 | 103 | 102 | 103 |
| Ranger | 2.9 | 102 | 102 | 102 | 8 | 24 | 100 | 100 | 101 |
| Hunter | - | 103 | <i>102</i> | <i>99</i> | 3 | 4 | 103 | <i>102</i> | <i>99</i> |
| 9429 | 2.8 | 103 | 102 | <i>99</i> | 5 | 7 | 103 | <i>103</i> | <i>99</i> |
| Sprint | 2.6 | 102 | <i>102</i> | <i>98</i> | 4 | 5 | 103 | <i>102</i> | <i>99</i> |
| 53V63 | 2.8 | 104 | 102 | <i>96</i> | 6 | 13 | 103 | 99 | - |
| GH750 | - | 101 | <i>102</i> | - | 4 | 4 | <i>102</i> | <i>102</i> | - |
| Emperor | 2.6 | 99 | 102 | - | 2 | 4 | 99 | 102 | - |
| Alliant | - | <i>99</i> | <i>101</i> | <i>113</i> | 5 | 3 | 99 | <i>101</i> | <i>113</i> |
| MP2000 | 2.7 | 102 | 101 | 108 | 3 | 9 | <i>102</i> | <i>103</i> | <i>108</i> |
| Rhino | - | 104 | 101 | <i>106</i> | 3 | 7 | 101 | 99 | <i>106</i> |
| 2888 | 3.2 | 102 | 101 | 104 | 4 | 11 | 102 | 101 | 104 |
| 205 | 1.6 | 103 | 101 | 102 | 7 | 19 | 104 | 101 | 103 |
| Lactator | 3.1 | 102 | 101 | <i>100</i> | 3 | 7 | 102 | 101 | <i>100</i> |
| Empire | - | 103 | 101 | 99 | 6 | 16 | 102 | 99 | <i>96</i> |
| Clean Sweep 1000 | - | <i>102</i> | <i>101</i> | <i>95</i> | 1 | 3 | <i>102</i> | <i>101</i> | <i>95</i> |
| Multi 5302 | - | 103 | 101 | - | 2 | 4 | - | - | - |
| Vernal (check) | 1.9 | 100 | 100 | 100 | 40 | 95 | 100 | 100 | 100 |
| Oneida VR (check) | - | 99 | 100 | 100 | 24 | 46 | 103 | 103 | 103 |
| 8498 | 3.1 | 98 | 100 | 100 | 3 | 8 | 99 | 101 | <i>101</i> |
| Nutrimax | - | 99 | <i>100</i> | <i>95</i> | 1 | 3 | 99 | <i>100</i> | <i>95</i> |
| 400SCL | - | <i>102</i> | <i>100</i> | - | 1 | 2 | <i>102</i> | <i>100</i> | - |
| Mariner II | - | <i>97</i> | <i>100</i> | - | 1 | 2 | 97 | <i>100</i> | - |
| Agate | - | 98 | 99 | 106 | 20 | 56 | 99 | 101 | 110 |
| AmeriGuard 301 | - | 99 | 99 | 95 | 2 | 6 | 97 | 98 | <i>97</i> |
| 9111 | - | 99 | 99 | - | 2 | 4 | - | - | - |

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | |
|--|------------------|--|-----------|------------|---------------------------------------|--------------------------------------|----------------------------------|-----------|-----------|
| | | All Sites | | | Test Sites ³ (Seedings) | Production ⁴ Years 1-3 | Rosemount-Southeast ⁵ | | |
| | | Yr 1 | Yr 1+2 | Yr 3 | | | Yr 1 | Yr 1+2 | Yr 3 |
| Guardian | 3.0 | 99 | 98 | 104 | 3 | 9 | 109 | 109 | 110 |
| Spredor 3 (check) | 1.8 | 99 | 98 | 97 | 18 | 45 | 97 | 96 | 92 |
| Banquet | - | 101 | 96 | 96 | 3 | 8 | 98 | 97 | 99 |
| Pointer | - | 108 | - | - | 4 | 3 | 112 | - | - |
| Forecast 3001 | 3.1 | 108 | - | - | 2 | 2 | 103 | - | - |
| Forecast 1001 | 2.9 | 107 | - | - | 2 | 2 | 109 | - | - |
| UltraLac | - | 105 | - | - | 1 | 1 | 105 | - | - |
| WL 327 | - | 103 | - | - | 3 | 2 | 109 | - | - |
| 54V54 | 2.5 | 102 | - | - | 7 | 3 | 104 | - | - |
| NetYield 500 | 2.9 | 100 | - | - | 1 | 1 | 100 | - | - |
| AC Viva | - | 100 | - | - | 2 | 2 | 104 | - | - |
| 645-II | - | 100 | - | - | 3 | 1 | - | - | - |
| AmeriGuard 302+Z | - | 93 | - | - | 1 | 1 | - | - | - |
| AmeriStand 403T | 2.1 | - | - | - | 3 | 0 | - | - | - |
| Baralfa 42 IQ | 2.3 | - | - | - | 1 | 0 | - | - | - |
| Defense+EV | - | - | - | - | 1 | 0 | - | - | - |
| DK134 | 2.5 | - | - | - | 4 | 0 | - | - | - |
| GH700 | - | - | - | - | 1 | 0 | - | - | - |
| Lightning II | - | - | - | - | 2 | 0 | - | - | - |
| Monument II | - | - | - | - | 3 | 0 | - | - | - |
| Multiplier 3 | - | - | - | - | 3 | 0 | - | - | - |
| Phabulous | - | - | - | - | 2 | 0 | - | - | - |
| Ripin | - | - | - | - | 1 | 0 | - | - | - |
| Value Plus I | 2.3 | - | - | - | 2 | 0 | - | - | - |
| 227 LH | 2.7 | - | - | - | 0 | 0 | - | - | - |
| 6310 | 2.8 | - | - | - | 0 | 0 | - | - | - |
| YieldMax | 2.3 | - | - | - | 0 | 0 | - | - | - |

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² Winter Survival Index: 1=superior, 2=very good, 3=good, 4=adequate, 5=low, 6=none. WSI is from joint Minnesota-Wisconsin 1996-2000 trials. ³ Locations: Rosemount-Southeast (Waseca/Lewistown/Plainview), Morris-Crookston-Stearns County, Lambertson, Grand Rapids. ⁴ Total production years (after seed year) for any location with reliable data. Year 1+2 averages 2 production years. Seed years or production years that winterkilled or developed unacceptably variable stands are excluded. ⁵ Seedings at Waseca were discontinued after 1994 and replaced by a Southeast site near Plainview.

Alfalfa yield as percent of Checks and Winter Survival Index (WSI) at West, Central, NE sites.

(**Bold** yield numbers represent 3 or more tests; regular type, 2 tests, *italic* type, only 1 test.)¹

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | | | | |
|--|------------------|--|-------------|--------------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|
| | | All Sites | | Morris-Crk-Stearns | | | Lamberton | | | Grand Rapids | | |
| | | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 |
| Checks, T/Ac 15%mc Hay | | 5.90 | 5.31 | 5.82 | 5.81 | 5.93 | 6.35 | 6.36 | 5.41 | 4.26 | 4.11 | 3.86 |
| Webfoot Supreme | - | 120 | - | - | - | - | - | - | - | - | - | - |
| Pasture Plus | - | 113 | - | - | - | - | - | - | - | - | - | - |
| Laser | - | 112 | 102 | 115 | 117 | - | 102 | 103 | - | - | - | - |
| Perfect | - | 112 | - | 115 | 112 | - | - | - | - | - | - | - |
| Persist | - | 112 | - | 117 | 116 | - | 107 | 105 | - | - | - | - |
| WinterMax | - | 111 | 105 | 111 | 111 | 105 | - | - | - | - | - | - |
| GH755 | - | 111 | 91 | 130 | 117 | - | - | - | - | - | - | - |
| MultiQueen | - | 111 | - | 142 | 127 | - | 105 | 102 | - | - | - | - |
| Paragon BR | - | 110 | 116 | - | - | - | - | - | - | - | - | - |
| Magnum III | - | 110 | 114 | 100 | 106 | 103 | 111 | 116 | 132 | 114 | 104 | 108 |
| GoldLeaf | 2.8 | 110 | 113 | - | - | - | - | - | - | - | - | - |
| 350 | 2.8 | 110 | 113 | 106 | 108 | - | - | - | - | - | - | - |
| Surpass | - | 110 | 108 | 105 | 106 | - | - | - | - | 111 | 108 | 110 |
| MagnaGraze | - | 110 | 101 | - | - | - | - | - | - | - | - | - |
| Quantum | - | 110 | 99 | 127 | 118 | - | - | - | - | - | - | - |
| Magnum III-Wet | - | 110 | 99 | 110 | 111 | - | - | - | - | - | - | - |
| 9326 | - | 110 | 98 | 116 | 115 | - | 97 | 102 | - | - | - | - |
| Root 66 | - | 110 | - | - | - | - | - | - | - | - | - | - |
| 6410 | 2.7 | 110 | - | 98 | - | - | 100 | - | - | - | - | - |
| Radiant | - | 109 | 117 | 112 | 108 | - | - | - | - | - | - | - |
| Magnum V | 3.0 | 109 | 112 | 107 | 114 | - | 101 | 105 | - | - | - | - |
| Imperial | - | 109 | 107 | 112 | 108 | - | - | - | - | - | - | - |
| Abundance | - | 109 | 107 | - | - | - | - | - | - | - | - | - |
| Voyager II | - | 109 | 104 | 109 | 108 | 105 | 114 | 109 | 105 | - | - | - |
| Monument | - | 109 | 102 | 105 | 111 | - | - | - | - | 107 | 110 | 102 |
| Magnum IV | - | 109 | 100 | 113 | 114 | - | 105 | 107 | - | - | - | - |
| Rebound 4.2 | 2.4 | 109 | - | 113 | 114 | - | 102 | 104 | - | - | - | - |
| Target II Plus | - | 108 | 117 | 107 | 106 | - | - | - | - | - | - | - |
| Harvstar 812HV | - | 108 | 111 | - | - | - | - | - | - | - | - | - |
| 631 | - | 108 | 109 | 112 | 115 | 108 | 101 | 101 | 109 | - | - | - |
| Gateway | - | 108 | 108 | 112 | 109 | - | - | - | - | - | - | - |
| Prolific | - | 108 | 107 | - | - | - | - | - | - | - | - | - |
| 620 | 2.5 | 108 | 106 | 113 | 110 | 99 | 104 | 103 | 107 | - | - | - |
| WL 324 | - | 108 | 105 | 108 | 108 | 106 | - | - | - | 110 | 104 | 92 |
| 2444 | - | 108 | 103 | 104 | 104 | 93 | 110 | 111 | 114 | - | - | - |
| FQ315 | - | 108 | 100 | 111 | 109 | - | - | - | - | - | - | - |
| Extend | 2.9 | 108 | 99 | - | - | - | - | - | - | 111 | 108 | 98 |
| BigHorn | 3.1 | 108 | 97 | 111 | 114 | - | - | - | - | - | - | - |
| WL 325 HQ | - | 108 | 94 | 111 | 109 | 92 | 92 | - | - | 111 | 110 | 96 |
| Geneva | 2.8 | 108 | - | 106 | 104 | - | 106 | 108 | - | - | - | - |
| Spirit | - | 108 | - | 106 | 108 | - | 103 | 103 | - | - | - | - |
| A4230 | - | 107 | 117 | - | - | - | - | - | - | - | - | - |
| Jade II | - | 107 | 109 | - | - | - | 107 | 107 | 109 | - | - | - |

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Rosemount-Southeast (Waseca/Lewiston/Plainview), Morris-Crookston-Stearns County, Lamberton, Grand Rapids. ⁴ Total production years (after seed year) for any location with reliable data. Year 1+2 averages 2 production years. Seed years or production years that winterkilled or developed unacceptably variable stands are excluded. ⁵ Seedings at Waseca were discontinued after 1994 and replaced by a Southeast site near Plainview.

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | | | | |
|--|------------------|--|------------|--------------------|------------|-----|------------|------------|------------|--------------|------------|------------|
| | | All Sites | | Morris-Crk-Stearns | | | Lamberton | | | Grand Rapids | | |
| | | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 |
| 630 | - | 107 | 109 | 100 | 102 | 100 | 105 | 107 | 107 | 102 | 99 | 112 |
| AlfaStar | - | 107 | 106 | 118 | - | - | 117 | 108 | 102 | - | - | - |
| Vitro | 2.6 | 107 | 106 | 107 | 105 | 109 | - | - | - | - | - | - |
| Baralfa 32 IQ | 3.0 | 107 | 105 | 124 | 119 | - | - | - | - | - | - | - |
| 5454 | 2.3 | 107 | 104 | 110 | 111 | 111 | 101 | 102 | 99 | 107 | 105 | 100 |
| Innovator+Z | 2.3 | 107 | 104 | 116 | 120 | - | 91 | 94 | 105 | - | - | - |
| Defiant | 2.3 | 107 | 102 | 110 | 105 | 95 | 105 | 107 | 106 | - | - | - |
| Green Feast | 2.9 | 107 | 101 | - | - | - | - | - | - | - | - | - |
| Milk River | - | 107 | - | 119 | 115 | - | 106 | 102 | - | - | - | - |
| FQ314 | 3.0 | 107 | - | 107 | 108 | - | - | - | - | - | - | - |
| Garst 645 | 2.8 | 106 | 114 | 111 | 108 | 116 | 106 | 104 | 119 | - | - | - |
| Trident II | - | 106 | 112 | 107 | 106 | 113 | 112 | 108 | 134 | 105 | 104 | 106 |
| Enhancer | - | 106 | 111 | - | - | - | 108 | 105 | 116 | - | - | - |
| Dominator | - | 106 | 108 | - | - | - | 101 | 99 | - | - | - | - |
| Bounty | - | 106 | 108 | 110 | 110 | 108 | - | - | - | - | - | - |
| DK142 | 2.9 | 106 | 108 | - | - | - | - | - | - | - | - | - |
| Notice | 2.6 | 106 | 104 | 113 | 111 | 104 | 102 | 102 | 105 | - | - | - |
| WinterStar | 2.4 | 106 | 102 | 110 | 108 | 99 | 100 | 104 | - | 105 | 104 | 104 |
| Evolution | - | 106 | 100 | 106 | 105 | 95 | - | - | - | 101 | 98 | 105 |
| Iroquois | - | 106 | 99 | 105 | 105 | 103 | 102 | 100 | 99 | 108 | 111 | 96 |
| DK140 | 2.8 | 106 | 98 | 112 | 111 | 96 | 100 | 100 | 95 | 102 | 100 | 97 |
| Aspen | 3.2 | 106 | 97 | - | - | - | - | - | - | 120 | 112 | 94 |
| Columbia 2000 | 3.1 | 106 | 97 | 109 | 110 | - | 104 | 106 | - | 111 | 105 | 93 |
| Rustler II | - | 106 | - | 113 | 111 | - | - | - | - | - | - | - |
| AmeriStand 201+Z | 2.0 | 106 | - | 106 | 106 | - | 101 | 103 | - | - | - | - |
| Platinum | - | 106 | - | - | - | - | 98 | - | - | - | - | - |
| 5312 | 3.0 | 105 | 105 | 101 | 104 | 101 | 106 | 104 | 99 | 107 | 104 | 107 |
| Breakout | 2.5 | 105 | 104 | - | - | - | - | - | - | 104 | 104 | 104 |
| Yielder | - | 105 | 104 | - | - | - | - | - | - | - | - | - |
| TMF 421 | - | 105 | 103 | 112 | 112 | - | 108 | 105 | - | 103 | 100 | 97 |
| Rainier | 2.9 | 105 | 103 | - | - | - | 102 | 103 | 108 | 96 | 100 | 98 |
| WinterKing | 2.5 | 105 | 102 | 110 | 107 | - | 108 | 106 | - | 102 | 99 | 97 |
| Avalanche+Z | 2.4 | 105 | 102 | 99 | 106 | 106 | 91 | 95 | 107 | 95 | 100 | 94 |
| A-395 | - | 105 | 101 | 111 | 106 | - | 108 | 105 | - | - | - | - |
| 329 | - | 105 | 100 | - | - | - | - | - | - | 114 | 103 | 101 |
| WinterGold | 2.6 | 105 | 99 | 110 | 108 | - | - | - | - | - | - | - |
| GH766 | - | 105 | 99 | 99 | 104 | - | 105 | 105 | - | 103 | 105 | 98 |
| DK124 | 2.8 | 105 | 98 | 107 | 109 | - | 100 | 101 | - | 104 | 101 | 98 |
| Forecast 3000 | - | 105 | - | 101 | 103 | - | 104 | 107 | - | - | - | - |
| A 30-06 | 1.9 | 105 | - | - | - | - | 87 | - | - | - | - | - |
| AmeriGraze 401+Z | - | 104 | 106 | 108 | 114 | - | - | - | - | - | - | - |
| Sterling | - | 104 | 105 | 111 | 111 | 111 | 102 | 99 | 100 | - | - | - |
| DK127 | 2.6 | 104 | 104 | 103 | 103 | 105 | 100 | 97 | 103 | 104 | 107 | 95 |
| WetLand | - | 104 | 102 | 108 | - | - | - | - | - | - | - | - |
| WL 232 HQ | 2.8 | 104 | 102 | 106 | 105 | - | 101 | 100 | - | - | - | - |
| Award | 3.3 | 104 | 101 | 97 | - | - | 100 | - | - | 114 | 112 | 101 |
| Viking 1 | 3.0 | 104 | 101 | 107 | 105 | 99 | 93 | 94 | 96 | 112 | 112 | 106 |
| Nemesis | - | 104 | 101 | 105 | 107 | 97 | 100 | 100 | 97 | - | - | - |
| GH757 | 3.1 | 104 | 101 | - | - | - | - | - | - | - | - | - |
| Affinity+Z | - | 104 | 100 | - | - | - | - | - | - | 105 | 104 | 100 |
| Ace | 3.1 | 104 | 99 | 118 | 113 | - | - | - | - | - | - | - |
| Mainstay | 2.7 | 104 | 97 | - | - | - | - | - | - | - | - | - |

Alfalfa yield as percent of Checks and Winter Survival Index (WSI) at West, Central, NE sites (continued).

(**Bold** yield numbers represent 3 or more tests; regular type, 2 tests, *Italic* type, only 1 test.)¹

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | | | | |
|--|------------------|--|------------|--------------------|------------|------------|------------|------------|------------|--------------|------------|------------|
| | | All Sites | | Morris-Crk-Stearns | | | Lamberton | | | Grand Rapids | | |
| | | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 |
| WinterGreen | 2.5 | 104 | 96 | - | - | - | - | - | - | 103 | 100 | 96 |
| 53Q60 | 3.0 | 104 | 94 | 106 | 107 | - | 103 | 103 | - | 101 | 98 | 94 |
| Somerset | 2.2 | 104 | - | - | - | - | - | - | - | - | - | - |
| Reliance | - | 103 | 120 | - | - | - | - | - | - | - | - | - |
| Depend+EV | - | 103 | 114 | - | - | - | - | - | - | 107 | 103 | 130 |
| Feast+EV | 2.2 | 103 | 105 | 104 | 103 | 105 | - | - | - | - | - | - |
| Complete | 2.7 | 103 | 104 | - | - | - | 96 | 99 | 106 | - | - | - |
| Demand | - | 103 | 102 | - | - | - | 104 | 102 | 103 | - | - | - |
| GH767 | 3.0 | 103 | 102 | - | - | - | - | - | - | - | - | - |
| Blazer XL | 2.8 | 103 | 101 | 106 | 101 | 98 | 111 | 105 | 103 | - | - | - |
| Wrangler | - | 103 | 101 | 100 | 106 | 103 | 97 | 98 | 106 | 103 | 100 | 91 |
| DK141 | 3.4 | 103 | 98 | 110 | 108 | 100 | 106 | 106 | 109 | 97 | 89 | 82 |
| Legendairy 2.0 | 2.8 | 103 | 98 | 117 | 113 | - | - | - | - | - | - | - |
| Multi 5301 | - | 103 | 97 | 103 | 103 | - | 106 | 104 | - | - | - | - |
| Multiplier II | - | 103 | 96 | 107 | 109 | - | 104 | 102 | - | 104 | 100 | 96 |
| Legend Gold | - | 103 | 96 | 103 | - | - | 89 | - | - | - | - | - |
| Spur | - | 103 | - | - | - | - | - | - | - | - | - | - |
| Samurai | - | 103 | - | - | - | - | - | - | - | - | - | - |
| Pristine | - | 103 | - | - | - | - | - | - | - | - | - | - |
| Magnum V-Wet | - | 103 | - | - | - | - | - | - | - | - | - | - |
| Abound | - | 102 | 111 | 104 | - | - | 96 | - | - | - | - | - |
| Gold Plus | - | 102 | 109 | 110 | 106 | - | - | - | - | - | - | - |
| TMF Generation | - | 102 | 105 | 106 | 101 | 100 | 99 | 99 | 107 | - | - | - |
| WL 252 HQ | - | 102 | 105 | 71 | - | - | - | - | - | - | - | - |
| Passport | - | 102 | 104 | - | - | - | - | - | - | - | - | - |
| Oneida (check) | - | 102 | 104 | 105 | 103 | 102 | 96 | 98 | 106 | 110 | 106 | 108 |
| Ranger | 2.9 | 102 | 102 | 119 | 125 | 117 | 98 | 97 | 99 | - | - | - |
| Hunter | - | 102 | 99 | - | - | - | - | - | - | - | - | - |
| 9429 | 2.8 | 102 | 99 | 116 | 107 | - | 91 | - | - | - | - | - |
| Sprint | 2.6 | 102 | 99 | 100 | - | - | - | - | - | - | - | - |
| 53V63 | 2.8 | 102 | 96 | 107 | 107 | - | 99 | 97 | - | 107 | 101 | 96 |
| GH750 | - | 102 | - | 105 | - | - | 96 | - | - | - | - | - |
| Emperor | 2.6 | 102 | - | - | - | - | - | - | - | - | - | - |
| Alliant | - | 101 | 113 | - | - | - | - | - | - | - | - | - |
| MP2000 | 2.7 | 101 | 108 | 106 | 107 | 113 | 97 | 94 | 105 | - | - | - |
| Rhino | - | 101 | 106 | 109 | 105 | - | - | - | - | - | - | - |
| 2888 | 3.2 | 101 | 104 | - | - | - | - | - | - | - | - | - |
| 205 | 1.6 | 101 | 102 | 112 | 105 | 104 | 92 | 94 | 100 | 93 | 100 | 102 |
| Lactator | 3.1 | 101 | 100 | - | - | - | - | - | - | - | - | - |
| Empire | - | 101 | 99 | 108 | 105 | 104 | 92 | 95 | 98 | 104 | 102 | 100 |
| Clean Sweep 1000 | - | 101 | 95 | - | - | - | - | - | - | - | - | - |
| Multi 5302 | - | 101 | - | 108 | 104 | - | 99 | 98 | - | - | - | - |
| Vernal (check) | 1.9 | 100 | 100 | 99 | 99 | 99 | 102 | 101 | 99 | 100 | 100 | 100 |
| Oneida VR (check) | - | 100 | 100 | 98 | 100 | 104 | 92 | 93 | 96 | 98 | 99 | 96 |
| 8498 | 3.1 | 100 | 100 | - | - | - | - | - | - | 94 | 96 | 99 |
| Nutrimax | - | 100 | 95 | - | - | - | - | - | - | - | - | - |
| 400SCL | - | 100 | - | - | - | - | - | - | - | - | - | - |
| Mariner II | - | 100 | - | - | - | - | - | - | - | - | - | - |
| Agate | - | 99 | 106 | 99 | 97 | 101 | 100 | 100 | 100 | 86 | 89 | 96 |
| AmeriGuard 301 | - | 99 | 95 | - | - | - | 100 | 100 | 93 | - | - | - |

| Variety, by Year 1+ Year 2 Average, Year 3, year 1 | WSI ² | Average Yield for Years 1, 1+2, and 3 After Seeding Year | | | | | | | | | | |
|--|------------------|--|------------|--------------------|------------|-----|------------|-------|-----|--------------|-----------|------------|
| | | All Sites | | Morris-Crk-Stearns | | | Lamberton | | | Grand Rapids | | |
| | | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 | Yr1 | Yr1+2 | Yr3 |
| 9111 | - | 99 | - | 97 | 100 | - | 101 | 99 | - | - | - | - |
| Guardian | 3.0 | 98 | 104 | 99 | 98 | 104 | 89 | 87 | 97 | - | - | - |
| Spredor 3 (check) | 1.8 | 98 | 97 | 104 | 103 | 100 | 101 | 101 | 108 | 97 | 96 | 100 |
| Banquet | - | 96 | 96 | - | - | - | - | - | - | 105 | 95 | 94 |
| Pointer | - | - | - | 110 | - | - | 102 | - | - | - | - | - |
| Forecast 3001 | 3.1 | - | - | 113 | - | - | - | - | - | - | - | - |
| Forecast 1001 | 2.9 | - | - | 105 | - | - | - | - | - | - | - | - |
| UltraLac | - | - | - | - | - | - | - | - | - | - | - | - |
| WL 327 | - | - | - | 97 | - | - | - | - | - | - | - | - |
| 54V54 | 2.5 | - | - | 113 | - | - | 90 | - | - | - | - | - |
| NetYield 500 | 2.9 | - | - | - | - | - | - | - | - | - | - | - |
| AC Viva | - | - | - | - | - | - | 96 | - | - | - | - | - |
| 645-II | - | - | - | - | - | - | 100 | - | - | - | - | - |
| AmeriGuard 302+Z | - | - | - | - | - | - | 93 | - | - | - | - | - |
| AmeriStand 403T | 2.1 | - | - | - | - | - | - | - | - | - | - | - |
| Baralfa 42 IQ | 2.3 | - | - | - | - | - | - | - | - | - | - | - |
| Defense+EV | - | - | - | - | - | - | - | - | - | - | - | - |
| DK134 | 2.5 | - | - | - | - | - | - | - | - | - | - | - |
| GH700 | - | - | - | - | - | - | - | - | - | - | - | - |
| Lightning II | - | - | - | - | - | - | - | - | - | - | - | - |
| Monument II | - | - | - | - | - | - | - | - | - | - | - | - |
| Multiplier 3 | - | - | - | - | - | - | - | - | - | - | - | - |
| Phabulous | - | - | - | - | - | - | - | - | - | - | - | - |
| Ripin | - | - | - | - | - | - | - | - | - | - | - | - |
| Value Plus I | 2.3 | - | - | - | - | - | - | - | - | - | - | - |
| 227 LH | 2.7 | - | - | - | - | - | - | - | - | - | - | - |
| 6310 | 2.8 | - | - | - | - | - | - | - | - | - | - | - |
| 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 1996-2000 trials. ³ Locations: Rosemount-Southeast (Waseca/Lewiston/Plainview), Morris-Crookston-Stearns County, Lamberton, Grand Rapids. ⁴ Total production years (after seed year) for any location with reliable data. Year 1+2 averages 2 production years. Seed years or production years that winterkilled or developed unacceptably variable stands are excluded. ⁵ Seedings at Waseca were discontinued after 1994 and replaced by a Southeast site near Plainview.

Alfalfa winter survival test results for Wisconsin and Minnesota, planted in April 1999 and rated in April 2000.

| Variety | Winter Survival Index: 1=Superior, 2=Very Good, 3=Good, 4=Adequate, 5=Low, 6=No Winter Survival | | |
|----------------------------------|---|---------------|------|
| | Arlington, Wis. | Morris, Minn. | Mean |
| Beaver (index 1 check) | 0.8 | 1.0 | 0.9 |
| Spredor 3 (index 1 check) | 1.0 | 2.0 | 1.5 |
| 526 (index 2 check) | 2.2 | 1.9 | 2.0 |
| Vernal (index 2 check) | 2.1 | 2.0 | 2.1 |
| Ameristand 403T | 1.7 | 2.5 | 2.1 |
| Somerset | 2.3 | 2.1 | 2.2 |
| Reliance | 2.5 | 2.3 | 2.4 |
| 54V54 | 2.6 | 2.3 | 2.5 |
| Wintergold | 2.6 | 2.4 | 2.5 |
| 620 | 2.8 | 2.5 | 2.6 |
| Mainstay | 2.6 | 2.7 | 2.7 |
| DK 140 | 3.2 | 2.4 | 2.8 |
| DK 124 | 2.8 | 2.8 | 2.8 |
| Netyield 500 | 3.3 | 2.4 | 2.9 |
| Ranger (index 3 check) | 2.5 | 3.2 | 2.9 |
| Green Feast | 3.2 | 2.6 | 2.9 |
| Forecast 1001 | 3.5 | 2.4 | 2.9 |
| Forecast 3001 | 3.5 | 2.7 | 3.1 |
| DK 141 | 3.4 | 3.3 | 3.3 |
| Dart (index 3 check) | 4.1 | 2.9 | 3.5 |
| Fortress (index 4 check) | 3.9 | 3.9 | 3.9 |
| G-2852 (index 4 check) | 4.1 | - | 4.1 |
| WL 316 (index 4 check) | - | 4.3 | 4.3 |
| Southern Special (index 5 check) | 4.6 | 4.7 | 4.6 |
| Archer (index 5 check) | 4.4 | 5.0 | 4.7 |
| CUF 101 (index 6 check) | 6.0 | 5.9 | 6.0 |
| Moapa 69 (index 6 check) | 6.0 | 6.0 | 6.0 |

WSI values in preceding alfalfa tables are from this trial or prior Wisconsin WS trials, with some Winter Survival Indexes averaged.

Forage quality as Relative Food Value and Milk Per Acre of Alfalfa Varieties, percent of checks.¹

**Seed years 1991-1999 Minn., 1995-1999 Wis.
Production Years. 1992-2000 Minn, 1996-2000 Wis.**

| Variety | RFV ² | Milk/Acre | N |
|-----------------------------|------------------|-----------|----|
| 205 | 102 | 110 | 2 |
| 2888 | 102 | 112 | 2 |
| 329 | 104 | 110 | 2 |
| 53Q60 | 101 | 105 | 4 |
| 53V63 | 103 | 105 | 2 |
| 5454 | 102 | 105 | 1 |
| 630 | 107 | 109 | 1 |
| 8498 | 102 | 118 | 2 |
| 9111 | 112 | 105 | 1 |
| 9326 | 104 | 113 | 2 |
| 9429 | 101 | 119 | 2 |
| Abound | 104 | 110 | 2 |
| Agate | 108 | 104 | 2 |
| Breakout | 105 | 111 | 2 |
| Colombia 2000 | 95 | 99 | 2 |
| DK 124 | 105 | 114 | 4 |
| DK 127 | 105 | 113 | 5 |
| DK 134 | 103 | 105 | 3 |
| DK 140 | 100 | 107 | 4 |
| DK 141 | 98 | 108 | 4 |
| Dominator | 105 | 98 | 1 |
| Extend | 102 | 111 | 2 |
| FQ 314 | 105 | 118 | 2 |
| Garst 645 | 106 | 105 | 1 |
| Geneva | 100 | 110 | 4 |
| GH 755 | 108 | 102 | 1 |
| GH 757 | 99 | 104 | 2 |
| GH 766 | 102 | 100 | 2 |
| GH 767 | 105 | 109 | 4 |
| Imperial | 102 | 109 | 1 |
| Innovator +Z | 103 | 105 | 2 |
| Legend Gold | 104 | 117 | 2 |
| Magnum III | 102 | 105 | 1 |
| Magnum III-Wet | 111 | 102 | 1 |
| Magnum IV | 99 | 102 | 1 |
| Oneida | 104 | 106 | 2 |
| Rainier | 103 | 110 | 2 |
| Spirit | 98 | 114 | 2 |
| Sterling | 103 | 107 | 1 |
| Target II Plus | 105 | 108 | 1 |
| Viking 1 | 106 | 103 | 1 |
| WinterGold | 102 | 117 | 2 |
| WinterKing | 103 | 107 | 2 |
| WL 252 HQ | 105 | 108 | 3 |
| Vernal-ck | 99 | 98 | 10 |
| WL 322 HQ-check | 104 | 104 | 8 |
| Vernal, checks ⁵ | 153 | 1057.8 | 10 |
| Test Mean | 107 | 1125.4 | 10 |
| LSD .05 | 6 | 10 | 7 |
| CV% | 4 | 7 | 7 |

Seed year 1999, production year, 2000

| Variety | Minn., Cut 6/1, *, 8/24 | | Wis., Cut 5/24, 7/13, 8/14 | |
|-----------------------------|-------------------------|------------------------|----------------------------|------------------------|
| | RFV ² | Milk/Acre ³ | RFV | Milk/Acre ⁴ |
| 53Q60 | 92 | 97 | 104 | 109 |
| 9429 | 99 | 114 | 104 | 125 |
| Colombia 2000 | 95 | 97 | 94 | 101 |
| DK 124 | 100 | 110 | 110 | 125 |
| DK 134 | 100 | 106 | -- | -- |
| DK 140 | 100 | 113 | 98 | 110 |
| DK 141 | 95 | 107 | 97 | 109 |
| Geneva | 91 | 103 | 102 | 115 |
| WinterGold | 99 | 114 | 105 | 121 |
| Cimarron VR-check | 102 | 98 | -- | -- |
| Vernal-check | 98 | 100 | 95 | 97 |
| WL 322 HQ-check | 100 | 102 | 105 | 103 |
| Vernal, checks ⁵ | 136 | 6,357 | 158 | 11,542 |
| Test Mean | 132 | 6,670 | 160 | 12,976 |
| LSD .05 | NS | NS | 5 | 9 |
| CV% | 8 | 10 | 4 | 6 |

*No second-cut 7/13 quality data due to hail damage.

Seed year 2000, production year, 2000.

| Variety | Minn., Cut 8/24 | | Wis., Cut 7/13, 8/14 | |
|-----------------------------|------------------|------------------------|----------------------|------------------------|
| | RFV ² | Milk/Acre ³ | RFV | Milk/Acre ⁴ |
| 6410 | 114 | 106 | 109 | 123 |
| A 30-06 | 107 | 97 | 104 | 119 |
| A4230 | 103 | 96 | 98 | 128 |
| Abound | 109 | 100 | 97 | 121 |
| Alliant | 115 | 104 | 97 | 120 |
| DK 124 | 113 | 103 | 107 | 112 |
| DK 127 | 102 | 91 | 106 | 114 |
| DK 134 | 111 | 99 | 104 | 116 |
| GH 700 | 106 | 101 | 106 | 136 |
| Somerset | 112 | 91 | 101 | 131 |
| Value Plus | 106 | 95 | 103 | 110 |
| Cimarron VR-check | 95 | 95 | -- | -- |
| Vernal-check | 100 | 100 | 100 | 100 |
| WL 322 HQ-check | 105 | 105 | -- | -- |
| Vernal, checks ⁵ | 152 | 3,086 | 197 | 5,270 |
| Test Mean | 164 | 3,049 | 204 | 6,255 |
| LSD .05 | 11 | NS | 5 | 19 |
| CV% | 7 | 14 | 3 | 11 |

¹ Varieties listed include joint Minnesota - Wisconsin quality trials (seed years 1995-2000) plus varieties from prior Minnesota quality trials currently marketed in Minnesota.

² RFV = Relative Feed Value index (calculated from NDF and ADF).

³ Milk per acre is calculated using season average quality and season average yield at Rosemount, Minn.

⁴ Milk per acre is calculated using season average quality and season average yield at Arlington, Wis.

⁵ Checks: Vernal used until 1994; Vernal and WL322HQ for 1995-2000 seed years

⁶ CV = Coefficient of Variation. Smaller number indicates less variation between replicates.

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 | Allied Seed | 38 | 2 | HR | R | HR | R | HR | R |
| 227LH | Allied Seed | 38 | 2 | HR | R | R | HR | HR | R |
| 2444 | Novartis | 0 | 3 | HR | R | HR | HR | HR | R |
| 2888 | Novartis | 50 | 3 | HR | HR | HR | HR | HR | R |
| 329 | L & H Seeds | 37 | 3 | HR | HR | HR | HR | HR | R |
| 350 | Allied Seed | 38 | 3 | HR | HR | HR | HR | HR | HR |
| 400 SCL | Allied Seed | 38 | 4 | HR | HR | HR | HR | HR | HR |
| 5312 | Pioneer Hi-Bred International | 53 | 3 | HR | HR | HR | HR | HR | R |
| 53Q60 | Pioneer Hi-Bred International | 53 | 3 | HR | R | R | HR | HR | R |
| 53V63 | Pioneer Hi-Bred International | 53 | 3 | HR | HR | HR | HR | HR | HR |
| 5454 | Pioneer Hi-Bred International | 53 | 4 | R | MR | HR | HR | HR | LR |
| 54V54 | Pioneer Hi-Bred International | 53 | 4 | HR | HR | HR | HR | HR | HR |
| 5-Star | Croplan Genetics | 18 | 5 | HR | R | HR | HR | HR | R |
| 620 | Garst Seed/Interstate | 24, 32 | 2 | HR | R | HR | HR | HR | R |
| 630 | Garst Seed | 24 | 4 | HR | MR | R | MR | R | - |
| 631 | Garst Seed | 24 | 4 | HR | R | HR | R | HR | MR |
| 6310 | Garst Seed | 24 | 3 | HR | HR | HR | HR | HR | R |
| 6410 | Garst Seed | 24 | 4 | HR | HR | HR | HR | HR | HR |
| 6420 | Garst Seed | 24 | 4 | HR | R | HR | R | HR | R |
| 645-II | Garst Seed | 24, 32 | 3 | HR | HR | HR | HR | HR | R |
| 8498 | Mallard Seeds | 43 | 3 | HR | R | HR | HR | HR | R |
| 9326 | LG Seeds | 42 | 3 | HR | R | HR | R | HR | R |
| 9429 | LG Seeds | 42 | 4 | HR | R | HR | HR | HR | HR |
| A 30-06 | PGI/MBS | 52 | 3 | HR | HR | HR | HR | HR | HR |
| A-395 | PGI/MBS | 52 | 3 | HR | R | HR | HR | HR | R |
| A4230 | CW / United Suppliers | 68 | 4 | HR | HR | HR | HR | HR | HR |
| Abound | Monsanto | 45 | 3 | HR | HR | HR | HR | HR | HR |
| Abundance | Bio-Plant Research | 13 | 4 | HR | MR | HR | R | HR | R |
| AC Viva | Oseco | 8 | 3 | HR | HR | - | MR | - | - |
| Ace | W-L Research / UAP Seeds | 0 | 4 | HR | R | HR | HR | HR | R |
| Affinity+Z | America's Alfalfa | 9, 51, 61 | 4 | HR | HR | HR | HR | HR | R |
| Agate | USDA / Minn.AES | 2, 70 | 2 | HR | - | HR | MR | R | - |
| AlfaStar | Shepard Seed / Kaystar | 35, 58 | 4 | HR | R | HR | HR | HR | R |
| Alliant | Monsanto | 45 | 4 | MR | R | HR | HR | HR | HR |
| AmeriGraze 401+Z | America's Alfalfa | 9, 61 | 4 | HR | HR | HR | HR | HR | R |
| AmeriGuard 301 | America's Alfalfa | 0 | 3 | HR | R | HR | HR | HR | R |
| AmeriGuard 302+Z | America's Alfalfa | 9, 61 | 3 | HR | HR | HR | HR | HR | HR |
| AmeriStand 201+Z | America's Alfalfa | 9, 61 | 2 | HR | HR | HR | R | HR | HR |
| AmeriStand 403T | America's Alfalfa | 9, 61 | 4 | HR | HR | HR | HR | HR | HR |
| Aspen | SeedTec / Brown Seed | 14 | 4 | HR | R | HR | HR | HR | R |
| AV3420 | AgVenture | 5 | 4 | HR | R | HR | HR | HR | HR |
| Avalanche+Z | America's Alfalfa | 9, 61 | 2 | HR | HR | HR | HR | HR | R |
| Award | Asgrow Seed | 45 | 4 | HR | HR | HR | HR | HR | R |

¹ Varieties includes those marketed in Minnesota for which disease resistance ratings were provided. Varieties not seeded in a recent Minnesota yield trial are excluded from the yield tables on pages 12-19. ² Developers and ratings generally follow Certified Alfalfa Seed Council report (if available), or from developer.

³ Seed source numbers reference Forage Seed Sources list, pages 26, 27.

⁴ Fall dormancy and pest resistance ratings are as reported in CASC publication or provided by a developer, with dormancy based on fall growth in mid-October after cutting 1st 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 CASC 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 | | | | | | | | | |
| Banquet | Tri-State Seed | 23 | 4 | HR | HR | HR | HR | HR | R |
| Baralfa 32 IQ | Barenbrug USA | 6, 12 | 3 | HR | R | HR | HR | HR | HR |
| Baralfa 42 IQ | Barenbrug USA | 6 | 4 | HR | HR | HR | HR | HR | HR |
| Baralfa 54 | Barenbrug USA | 12 | 5 | R | R | HR | HR | HR | - |
| BigHorn | Cargill Hybrid Seeds | 16 | 4 | HR | R | HR | HR | HR | HR |
| Blazer XL | CroPlan Genetics | 18 | 3 | R | R | HR | HR | HR | R |
| Bounty | PGI / MBS | 52, 54 | 2 | HR | R | HR | HR | HR | R |
| Breakout | Brown Seed | 14 | 4 | HR | R | HR | HR | HR | R |
| Buck | Cargill Hybrid Seeds | 16 | 3 | HR | R | HR | R | R | R |
| Clean Sweep 1000 | Agway / Allied Seed | 8 | 3 | HR | R | HR | HR | HR | R |
| Columbia 2000 | Allied Seed | 2, 6 | 4 | R | R | R | LR | LR | S |
| Complete | Arrow Seed / Fontanelle Hybrids | 23 | 3 | HR | HR | HR | HR | HR | R |
| Cyclone | Tri-State Seed | 65 | 3 | HR | HR | HR | HR | HR | HR |
| Defense+EV | AgriPro Seeds | 3 | 3 | HR | HR | HR | HR | HR | HR |
| Defiant | AgriPro Seeds | 3 | 2 | HR | HR | HR | R | HR | R |
| Demand | AgriPro Seeds | 3 | 3 | HR | HR | HR | HR | HR | R |
| Depend+EV | AgriPro Seeds | 3 | 4 | HR | HR | HR | HR | HR | R |
| DK124 | Monsanto | 45 | 2 | HR | HR | HR | HR | HR | HR |
| DK127 | Monsanto | 45 | 3 | HR | R | R | HR | HR | HR |
| DK131HG | Monsanto | 45 | 3 | HR | HR | HR | HR | HR | R |
| DK134 | Monsanto | 45 | 3 | HR | HR | HR | HR | HR | HR |
| DK140 | Monsanto | 45 | 4 | HR | R | HR | HR | HR | HR |
| DK141 | Monsanto | 0 | 4 | HR | HR | HR | HR | HR | HR |
| DK142 | Monsanto | 45 | 4 | HR | R | HR | R | HR | HR |
| Dominator | AgriPro Seeds | 3 | 4 | HR | R | HR | HR | HR | R |
| Emperor | ABI Alfalfa / Terning Seeds | 1, 61 | 4 | HR | HR | HR | HR | HR | HR |
| Empire | Brunner Seed Farm | 15 | 2 | HR | R | HR | HR | HR | R |
| Enhancer | Bio-Plant Research | 13, 23 | 4 | HR | R | HR | R | HR | MR |
| EverGreen | Novartis | 50 | 3 | HR | R | HR | HR | HR | R |
| Evolution | Mycogen Seeds | 16, 46 | 2 | HR | R | HR | HR | HR | R |
| Extend | Spangler / Grassland West | 59 | 4 | HR | R | R | HR | HR | R |
| Feast+EV | AgriPro Seeds | 3 | 3 | HR | R | HR | HR | HR | R |
| Forecast 1000 | Dairyland Seed | 21 | 3 | HR | R | HR | R | HR | R |
| Forecast 1001 | Dairyland Seed | 21 | 4 | HR | R | HR | R | HR | R |
| Forecast 3000 | Dairyland Seed | 21 | 4 | HR | R | HR | R | R | MR |
| Forecast 3001 | Dairyland Seed | 21 | 3 | HR | R | HR | R | HR | R |
| FQ 302HR | Cargill Hybrid Seeds | 16 | 3 | HR | R | HR | HR | HR | R |
| FQ 314 | Cargill Hybrid Seeds | 16 | 3 | HR | HR | HR | HR | HR | HR |
| FQ 315 | Cargill Hybrid Seeds | 16 | 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 | Novartis | 50 | 4 | HR | HR | HR | HR | HR | HR |
| GH700 | Golden Harvest | 28 | 4 | HR | HR | HR | HR | HR | HR |
| GH750 | Golden Harvest | 27 | 4 | HR | HR | HR | HR | HR | HR |
| GH755 | Golden Harvest | 27 | 4 | HR | R | HR | HR | HR | R |
| GH757 | Golden Harvest | 28 | 4 | HR | HR | HR | HR | HR | HR |
| GH766 | Golden Harvest | 27 | 3 | HR | R | HR | HR | HR | R |
| GH767 | Golden Harvest | 28 | 2 | HR | R | HR | HR | HR | R |
| Gold Plus | PGI / MBS | 52, 63 | 4 | HR | R | HR | HR | HR | R |
| GoldLeaf | BPR / Gold Country Seed | 6, 26 | 3 | HR | R | HR | R | HR | R |
| GreenFeast | Minnesota Seed Solutions | 44 | 2 | HR | HR | HR | HR | HR | HR |
| Guardian | AgVenture | 5 | 3 | HR | HR | HR | HR | HR | R |

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 | | | | | | | | | |
| Harvstar 812HY | Landec Ag | 39 | 4 | HR | R | HR | R | HR | MR |
| Hay Maker II | Mid-Atlantic / Kussmaul Seeds | 36 | 4 | HR | R | HR | HR | HR | R |
| Hunter | Ramy International | 56 | 4 | HR | R | HR | HR | HR | R |
| Imperial | ABI / Terning Seeds | 1, 61 | 3 | HR | R | HR | HR | HR | R |
| Innovator+Z | America's Alfalfa | 9, 61 | 3 | HR | HR | HR | HR | HR | R |
| Iroquois | Cornell University | 2, 6, 55 | 2 | HR | S | MR | S | S | - |
| Jade II | NC+ Hybrids | 47 | 4 | HR | R | HR | R | HR | MR |
| Lactator | Elk Mound Seed | 0 | 2 | HR | HR | HR | HR | R | R |
| Laser | AMPAC / DeLong | 10, 62 | 4 | HR | R | HR | R | HR | MR |
| Legend Gold | Legend Seeds | 40 | 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 | HR | HR |
| MagnaGraze | Dairyland Seed | 21 | 3 | HR | R | HR | R | HR | R |
| Magnum III | Dairyland Seed | 21 | 4 | R | MR | R | MR | R | LR |
| Magnum III-Wet | Dairyland Seed | 21 | 3 | R | MR | R | MR | R | MR |
| Magnum IV | Dairyland Seed | 21 | 4 | HR | R | HR | R | HR | MR |
| Magnum V | Dairyland Seed | 21 | 4 | HR | R | HR | R | HR | MR |
| Magnum V-Wet | Dairyland Seed | 21 | 3 | HR | R | HR | R | HR | R |
| Mainstay | AgVenture | 5 | 3 | HR | R | HR | HR | HR | R |
| Mariner II | Bio-Plant Research | 13 | 2 | HR | R | HR | R | HR | R |
| Maxi-Graze GT | CroPlan Genetics | 18 | 2 | HR | R | HR | HR | HR | R |
| Maximum I | Fred Gutwein & Sons | 31 | 3 | HR | HR | HR | HR | HR | R |
| Milk River | R.J. Hunt Seed | 55 | 3 | HR | R | HR | HR | HR | R |
| Monument | Geertson Seed Farms | 25 | 3 | R | LR | R | - | MR | - |
| Monument II | Geertson Seed Farms | 25 | 4 | R | LR | HR | S | R | - |
| MP2000 | Croplan Genetics | 18 | 3 | HR | R | HR | HR | HR | HR |
| Multi 5301 | Geertson Seed Farms | 25 | 4 | R | R | HR | HR | MR | - |
| Multiplier 3 | Mycogen Seeds | 16, 46 | 3 | HR | R | HR | HR | HR | HR |
| Multiplier II | Mycogen Seeds | 16 | 3 | HR | HR | HR | HR | HR | R |
| MultiQueen | Fred Gutwein & Sons | 31 | 4 | HR | R | HR | HR | HR | R |
| Nemesis | Renk Seed | 57 | 3 | R | HR | HR | HR | HR | HR |
| NetYield 500 | NetSeeds | 48 | 4 | HR | R | HR | R | HR | MR |
| Notice | Midwest Seed Genetics | 19 | 3 | HR | R | HR | HR | HR | R |
| NutriMax | Alfalfa Genetics Direct | 7 | 4 | HR | HR | HR | HR | HR | R |
| Oneida (check) | Cornell Univ. | 0 | 3 | HR | - | HR | S | HR | - |
| Oneida VR (check) | N.Y.S.I.P. / Public | 0 | 3 | R | HR | HR | MR | MR | - |
| Paragon BR | Bio-Plant Research | 13 | 3 | HR | R | HR | R | HR | R |
| Passport | Wyffels Hybrids / Chempro | 0 | 3 | HR | - | - | HR | HR | R |
| Pasture Plus | PGI / MBS | 52 | 3 | HR | R | HR | R | HR | R |
| Perfect | Grassland Central | 29 | - | HR | HR | HR | HR | HR | HR |
| Persist | Kaltenberg Seed Farms | 34 | 4 | HR | R | HR | R | HR | MR |
| Phabulous | Trelay | 64 | 4 | HR | HR | HR | HR | HR | HR |
| Platinum | Midwest Seed Genetics | 19 | 4 | HR | HR | HR | HR | HR | HR |
| Pointer | Dalhousie Seeds | 20 | 3 | HR | R | HR | HR | HR | HR |
| Pristine | Trelay | 64 | 4 | HR | R | HR | HR | HR | R |
| Prolific | Bio-Plant Research | 13 | 3 | HR | R | HR | R | HR | R |
| Quantum | Renk Seed | 57 | 2 | HR | HR | HR | HR | HR | R |
| Radiant | AMPAC / DeLong | 10, 62 | 4 | HR | HR | HR | MR | HR | HR |
| Rainier | Novartis | 50 | 3 | HR | R | 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 | | | | | | | | | |
| Ranger | USDA / Nebraska AES | 2 | 3 | MR | S | MR | S | S | - |
| Rebound 4.2 | CroPlan Genetics | 18 | 4 | HR | HR | HR | HR | HR | HR |
| Reliance | Forage Genetics | 0 | 3 | HR | HR | HR | HR | HR | R |
| Rhino | Geertson Seed Farms | 25 | 3 | HR | R | R | R | R | R |
| Ripin | AMPAC / DeLong | 10, 62 | 4 | HR | R | HR | R | HR | R |
| Root 66 | Trelay | 64 | 4 | HR | HR | HR | HR | 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 | Novartis | 50 | 3 | HR | HR | HR | HR | HR | HR |
| Spirit | Fontanelle Hybrids | 52 | 3 | HR | R | HR | R | HR | MR |
| Spredor 3 (check) | Novartis | 50 | 1 | HR | MR | HR | R | MR | S |
| Sprint | Specialty Seeds | 60 | 3 | HR | R | HR | R | HR | HR |
| Spur | Albert Lea Seed House | 6 | 4 | HR | R | HR | HR | HR | R |
| Sterling | Cargill Hybrid Seeds | 16 | 2 | HR | R | HR | HR | HR | R |
| Surpass | Andrews Seed | 6, 11 | 3 | HR | R | HR | MR | R | - |
| Target II Plus | BPR / Producer's Hybrids | 54 | 3 | HR | R | HR | R | HR | MR |
| TMF 421 | Mycogen Seeds | 16, 46 | 2 | HR | HR | R | HR | HR | HR |
| TMF 4355LH | Mycogen Seeds | 16, 46 | 3 | HR | R | HR | HR | HR | R |
| TMF Generation | Mycogen Seeds | 16, 46 | 4 | HR | HR | HR | HR | HR | R |
| Trident II | Cargill Hybrid Seeds | 16 | 3 | HR | R | R | R | HR | MR |
| UltraLac | Elk Mound Seed | 22 | 2 | HR | HR | HR | HR | HR | HR |
| Value Plus 1 | Brown Seed | 14 | 4 | HR | R | HR | HR | HR | R |
| Vernal (check) | USDA / Wisconsin AES | 2, 6, 55, 70 | 2 | R | - | MR | - | - | - |
| Viking 1 | Novartis | 50 | 2 | R | HR | HR | R | R | - |
| Vitro | North-Gro Seed | 49 | 3 | HR | HR | HR | HR | HR | R |
| Voyager II | Lemke Seeds / Ziller Seed | 41, 72 | 4 | HR | R | HR | R | HR | MR |
| Webfoot Supreme | Great Lakes Hybrids | 30 | 4 | R | R | R | R | R | LR |
| WetLand | Lemke Seeds / Ziller Seed | 54, 72 | 3 | R | MR | R | R | HR | MR |
| WinterGold | Renk Seed | 57 | 4 | HR | HR | HR | HR | HR | HR |
| WinterGreen | Renk Seed | 57 | 3 | HR | HR | HR | HR | HR | R |
| WinterKing | Wensman Seed | 69 | 3 | HR | HR | HR | HR | HR | R |
| WinterMax | Alfalfa Genetics Direct | 7 | 2 | HR | HR | HR | HR | HR | R |
| WinterStar | Wensman Seed | 69 | 2 | HR | HR | HR | HR | HR | R |
| WL 232 HQ | W-L Research | 4, 44, 51, 67, 71 | 2 | HR | HR | HR | HR | HR | HR |
| WL 252 HQ | W-L Research | 4, 44, 67, 71 | 2 | HR | R | HR | HR | HR | LR |
| WL 324 | W-L Research | 4, 44, 51, 67, 71 | 3 | HR | R | HR | HR | HR | HR |
| WL 325 HQ | W-L Research | 4, 44, 51, 67, 71 | 3 | HR | R | HR | HR | HR | R |
| WL 327 | W-L Research | 0 | 4 | HR | R | HR | HR | HR | HR |
| Wrangler | USDA / Nebraska AES | 6, 55, 70 | 2 | R | LR | R | LR | HR | - |
| Yielder | AgriPro Seeds | 3 | 3 | HR | R | HR | HR | HR | R |
| 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 not seeded in a recent Minnesota yield trial are excluded from the yield tables on pages 12-19. ² Developers and ratings generally follow Certified Alfalfa Seed Council report (if available), or from developer.

³ Seed source numbers reference Forage Seed Sources list, pages 26, 27.

⁴ Fall dormancy and pest resistance Ratings are as reported in CASC publication or provided by a developer, with dormancy based on fall growth in mid-October after cutting 1st 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 CASC 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 marker, or discontinued for 2001. The variety is listed to update previous report with 2000 production year data. | 11 | Andrews Seed Co. 580 S. Oregon, Ontario, OR 97914 541-889-9109 | 24 | 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 | 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 | 12 | Barenbrug USA P.O. Box 239, Tangent, OR 97389 800-547-4101 | 26 | 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 | 13 | Bio Plant Research P.O. Box 320, 116E.State St., Camp Point, IL 62320 800-593-7708, 217-593-7707 | 27 | Golden Harvest Box A, 100 J.C. Robinson Blvd. Waterloo, NE 68069 402-779-2531 |
| 4 | AgVenture East 65064 250th Ave., Kasson, MN 55944 800-657-4890 | *14 | Brown Seed Farms P.O.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 |
| 5 | AgVenture Central 513 Main St., Madison Lake, MN 56063 507-243-3263 | 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 Inc. P.O. Box 29, 207 N 7th St. Kentland, IN 47951-0029 888-999-0859, 219-474-5557 | 16 | Cargill Hybrid Seeds P.O. Box 5645 MS16 Minneapolis, MN 55440, 612-742-6743 | 29 | Grassland Central 12912 Ventura Court #24 Shakopee, MN 55379 952.233.5181 |
| 5 | AgVenture West P.O.Box 184, Jeffers, MN 56145 507-628-4929 | *17 | CEBECO International Seeds Inc. P.O. Box 229, Halsey, OR 97348 541-369-2251 | 30 | Great Lakes Hybrids 56997 Juneau Rd., Mankato, MN 56001 507-278-4202 |
| 5 | AgVenture West Central 37752 880 Ave., Olivia, MN, 56277 320-523-2250 | *18 | CroPlan Genetics P.O. Box 64406, MS7455 St. Paul, MN 55164-0406 800-851-8810, 651-634-8105 | 30, | Great Lakes Hybrids 9915 W. M-21, Ovid, MI 48866 800-257-7333, 517-834-2251 |
| *6 | Albert Lea Seed House 1414 West Main, P.O. Box 127 Albert Lea, MN 56007 800-352-5247, 507-373-3161 | 19 | Crows Hybrid/Midwest Seed Genetics P.O. Box 518, 23751 Hwy. 30 E. Carroll, IA 51401 800-369-8218, 712-792-6691 | 31 | Gutwein/Garst Seeds 15691 West 600 South, Francesville, IN 47946 800-457-2700, 219-567-9141 |
| 7 | Alfalfa Genetics Direct P.O. Box 404, Princeton, IL 61356-0404 866-233-7283 | 19 | Crows Hybrid/Midwest Seed Genetics 5932 Schuman Drive, Madison, WI 53711 608-274-8215 | 32 | Interstate Payco Seed Co. P.O. Box 338, West Fargo, ND 58078 701-282-7338 |
| 8 | Allied Seed 1108 Hillisdale Drive, Macon, MO 63552 800-880-8127 | 20 | Dahico Seeds 14730 15th St., Cokato, MN 55321 320-286-5982 | 33 | Jung Seed Genetics, Inc. 341 South High St., Randolph, WI 53956 800-242-1855, 920-326-5891 |
| 8 | Allied Seed 9311 Highway 45, Nampa, ID 83686 219-833-6992 | *21 | Dairyland Seed Co. P.O. Box 958, West Bend, WI 53095 800-236-0163 | 33 | Jung Seed Genetics, Inc. 1229 NW 41st St, Rochester, MN 55901 507-288-1930 |
| 9 | America's Alfalfa 12351 W.96th Terrace, Suite 101 Lenexa, KS 66215 913-599-2240 Ext. 11 | 22 | Elk Mound Seed P.O. Box 187, 308 Railroad Ave Elk Mound, WI 54739 715-879-5556 | 34 | Kaltenberg Seed Farms P.O. Box 278, 55506 State Rd.19 Waunakee, WI 53597 800-383-3276, 608-849-5021 |
| 10 | AMPAC Seed Co. P.O. Box 318, Tangent, OR 97389 614-890-2929 | 23 | Fontanelle Hybrids 10981 8th St., Fontanelle, NE 68044-2505 402-721-1410 | 35 | KayStar Seeds P.O. Box 947, Huron, SD 57350 605-352-8791 |
| 10 | AMPAC Seed Co. 403 Wooster Rd., Winona Lake, IN 46590 219-268-9549 | | | 36 | Kussmaul Seeds 9020 Hwy. 18, Mt. Hope, WI 53816 608-988-4568 |

- 37 L & H Seed
4756 West Hwy. 260, Connell, WA 99326
509-234-4443
- *38 La Crosse Forage & Turf Seed Co.
P.O. Box 995, LaCrosse, WI 54602-0995
800-329-1909
- 39 Landec Ag
P.O. Box 898, 306 North Main St.
Monticello, IN 47960-0898
800-321-3177
- 40 Legend Seeds
P.O. Box 241, DeSmet, SD 57006
605-854-3346
- 41 Lemke Seeds
10220 N. Granville Rd., Mequon, WI 53097
262-242-2647
- 42 LG Seeds, P.O. Box 216, 905 Dexter St.
Prescott, WI 54021
800-637-2887
- 43 Mallard Seed
P.O. Box 637, 311 W. Broadway
Plainview, MN 55964
800-562-1768, 507-534-2300
- *44 Minnesota Seed Solutions
P.O. Box 346, Savage, MN 55378
800-328-5898, 952-445-2606
- 45 Monsanto
3670 CR 207, Liberty Hill, TX, 78642
512-778-5316
- 46 Mycogen Seeds/Dow Agroscience
9330 Zionville Road, Indianapolis, IN 46268
317-337-7560
- 47 NC+ Hybrids
Box 4408, Lincoln, NE 68504
402-467-2517
- 48 NetSeeds
9001 Hickman Rd., Ste. 320
Urbandale, IA 50322
515-331-0939
- 49 North-Gro Seeds Inc.
613 N. Randolph St., Cuba City, WI 53807
608-744-7333
- 50 Novartis Seeds
P.O. Box 959
7500 Olson Memorial Highway
Golden Valley, MN 55427
612-593-7286
- *51 Olds Seed Solutions
2901 Packers Ave., Madison, WI 53704
800-356-7333, 608-249-9291
- 52 PGI / MBS Genetics LLC
225 West 1st St., Story City, IA 50248
800-247-3967, 515-733-5274
- 53 Pioneer Hi-Bred International Inc.
7100 NW 62nd Ave., Box 1150
Johnston, IA 50131
515-334-6645
- 54 Producers Hybrids, Inc.
P.O. Box C, Battle Creek, NE 68715
888-675-3190, 402-675-2975
- *55 R.J. Hunt Seed Co.
13477 Co. Rd. 101, Wadena, MN 56482
218-631-4190
- 56 Ramy International Ltd.
1329 N. River Front Drive
Mankato, MN 56001
800-658-7269, 507-387-4091
- *57 Renk Seed Company
6800 Wilburn Rd., Sun Prairie, WI 53590
800-289-7365, 608-837-7351
- 58 Shepherd Seeds
RR 1 535 Middle Rd., South Beloit, IL 61080
800-383-2676
- 59 Spangler Seeds
803 W. Racine St., Jefferson, WI 53549
414-674-4606
- *60 Specialty Seeds
1600 Railroad Ave., Albany, MN 56307
320-845-7689
- 61 Terner Seeds, Inc.
15365 60th St. SW, Cokato, MN 55321
320-286-2168
- 62 The DeLong Company
513 Front St., Clinton, WI 53525
608-676-2255
- *63 Top Farm Hybrids
P.O. Box 850, Cokato, MN 55321
320-286-5516
- 64 Trelay, Inc.
11623 State Rd 80, Livingston, WI 53554
800-421-0397, 608-943-6363
- 65 Tri-State Seed
28401 Golden Gate Rd.
Sleepy Eye, MN 56085
800-203-8581, 507-794-3078
- 66 Twin Cities Seeds
7265 Washington Ave. South, Edina, MN 55439
800-545-8873, 612-545-8879
- 67 UAP Midwest
P.O. Box 10, Wall Lake, IA 51466
712-664-2444
- 68 United Suppliers Inc.
P.O. Box 538, Eldora, IA 50627
515-858-2341
- 69 Wensman Seed Co.
P.O. Box 190, Wadena, MN 56482
218-631-2954
- *70 Werner Farm Seeds
3104 Millersburg Blvd., Dundas, MN 55019
507-645-7995
- 71 W-L Research, Inc.
P.O. Box 8112, 2901 Packers Ave.
Madison, WI 53708-8112
800-406-7662, 608-240-0630
- 72 Ziller Seed Co., Inc.
76374 380th St., Bird Island, MN 55310
320-365-3674

* These sources are useful contacts for public alfalfas (2,6,55,70) and several other forages species, such as
Red clover (17,18,21,38,44,51,55,57,60,63,70)
Birdsfoot trefoil (2,6,17,38,44,51,55,70)
Kura clover (6,38,70)
Reed canarygrass (2,6,14,38,44,51,55,70)
Smooth bromegrass (2,6,14,18,57)
Orchardgrass (2,6,14,17,18,38,44,51,55,57,70)
Timothy (2,6,14,17,18,38,55,57,63,70)
Tall fescue (2,6,17,18,38,44,51).

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 when Rosemount was only harvested twice. Yields are generally lower at Grand Rapids than at Rosemount due to a shorter growing season.

Roseau and Nuelin, 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 was 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, tons dry matter per acre, of smooth bromegrass seeded at two locations, 1998.

| Variety | Rosemount 1998-2000 | Morris 1999-2000 |
|----------------------|------------------------|---------------------|
| Alpha | 5.2 | 2.6 |
| Badger | 4.6 | 2.5 |
| Bounty | 5.1 | 2.7 |
| Lincoln ¹ | 4.8 | - |
| York | 5.4 | 2.7 |
| LSD 5% | 0.3 | NS |

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

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

| Variety | Rosemount | | | Grand Rapids | |
|-----------|-----------|------|-----------|--------------|-----------|
| | 1995-1996 | 1998 | 1999-2000 | 1995-96 | 1999-2000 |
| Bright | - | 3.6 | 3.6 | - | - |
| Dawn | - | 4.0 | 4.0 | - | 3.7 |
| Empire | 3.6 | 4.0 | - | 2.2 | 3.5 |
| Fergus | - | 3.9 | - | - | - |
| Georgia 1 | - | - | 3.8 | - | 3.6 |
| Leo | 3.5 | 3.9 | 3.5 | 2.3 | - |
| Norcen | 3.6 | 4.3 | 3.9 | 2.2 | 3.6 |
| Nuelin | 3.3 | 3.7 | 3.6 | - | 3.6 |
| Roseau | 3.4 | 4.1 | 3.7 | - | 3.8 |
| Steadfast | - | 3.1 | 2.8 | - | 2.7 |
| Trevig | - | 4.1 | - | - | - |
| Viking | 3.8 | 3.8 | 3.9 | 2.2 | 3.6 |
| Witt | 3.5 | 4.0 | 3.6 | - | - |
| LSD 5% | NS | 0.5 | 0.3 | 0.2 | 0.3 |

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.

Cicer milkvetch 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.

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

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

| Variety | Grand Rapids | | | Rosemount | | | Morris | | |
|---------|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | 1999-2000 | 1999-2000 | 1999-2000 | 1999-2000 | 1999-2000 | 1999-2000 | 1999-2000 | 1999-2000 | 1999-2000 |
| Hi Pal | 4.0 | 4.4 | 2.5 | | | | | | |
| Lutana | 3.6 | 4.3 | 2.4 | | | | | | |
| Monarch | 3.5 | 4.4 | 2.4 | | | | | | |
| Windsor | 3.6 | 4.3 | 2.2 | | | | | | |
| LSD 5% | 0.4 | NS | NS | | | | | | |

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

| Variety | Maturity ¹ | Grand Rapids | | Rosemount | | Morris | |
|------------|-----------------------|--------------|-----------|-----------|-----------|-----------|-----------|
| | | 1990-1994 | 1999-2000 | 1998-1999 | 1999-2000 | 1998-1999 | 1999-2000 |
| AC Nordic | L | - | 4.6 | - | 4.3 | - | - |
| Albert | - | - | 4.5 | - | - | - | - |
| Ambassador | I | 3.5 | 4.5 | 4.4 | - | 2.0 | - |
| Bengal | I | - | - | - | 4.3 | - | - |
| Condor | - | - | 4.7 | 4.5 | - | 2.0 | - |
| Crown | I | 3.5 | - | 4.5 | - | 2.0 | - |
| Dawn | L | 3.6 | - | - | - | - | - |
| Duke | L | - | 4.7 | 4.8 | 4.3 | 2.3 | - |
| Elsie | I | 3.5 | 4.5 | - | 4.1 | - | - |
| Haymate | L | - | 4.6 | 4.5 | - | 2.2 | - |
| Hawkeye | I | - | 4.7 | - | 4.5 | - | - |
| Justus | I | 3.4 | 4.2 | 4.5 | 4.3 | 2.1 | - |
| Megabyte | I | - | 4.6 | - | 4.6 | - | - |
| Mammoth | E | - | - | - | 4.4 | - | - |
| Napier | I | 3.6 | - | 4.3 | - | 1.7 | - |
| Orbit | - | 3.4 | - | 3.6 | - | 2.2 | - |
| Orion | L | 3.7 | 5.1 | 4.7 | 4.5 | 2.3 | - |
| Potomac | E | 3.5 | - | 4.4 | 4.1 | 2.1 | - |
| Sterling | I | 3.4 | - | - | - | - | - |
| Warrior | I | - | - | - | 4.4 | - | - |
| LSD 5% | | NS | 0.5 | 0.4 | 0.3 | 0.4 | |

¹ Maturity: E=early, I=intermediate, L=late

RED CLOVER

Red clover can be seeded in pure stands or with timothy 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. 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. These trials were harvested at Morris in 1996 and 1997 and at Rosemount 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.

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.

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

| Variety | Grand Rapids | | Rosemount | | Morris | | |
|-------------|--------------|------|-----------|------|--------|------|------|
| | 1999-2000 | 2000 | 1997-1998 | 2000 | 1996 | 1997 | 1998 |
| Arlington | 3.2 | 4.0 | 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 | - | 4.4 | - | 5.5 | - | - | - |
| Juliette | - | 4.7 | - | 5.6 | - | - | - |
| Marathon | 3.6 | 4.6 | 4.0 | 5.6 | 3.4 | 1.7 | 2.6 |
| Prima | 3.7 | 5.1 | - | 5.3 | - | - | - |
| Randolph | 3.8 | - | 4.1 | - | 3.8 | 2.0 | 2.8 |
| Redland III | - | - | - | - | 3.3 | 1.9 | 2.8 |
| Redstar | - | 4.8 | - | 5.9 | - | - | - |
| Scarlett | 3.8 | - | 4.2 | - | 3.7 | 1.8 | 2.8 |
| LSD 5% | 0.3 | 0.5 | 0.6 | 0.6 | NS | 0.3 | NS |

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 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. Cattle produced well on the grass only if it was grazed when it was between 6 and 24 inches tall.

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.

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.

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

| Variety | Grand Rapids | | Rosemount | | Morris |
|----------|--------------|------|-----------|------|-----------|
| | 1994-1996 | 2000 | 1994-1996 | 2000 | 1994-1996 |
| Chiefton | - | 6.3 | - | 4.5 | - |
| Lara | - | 3.0 | 3.0 | - | - |
| Palaton | 3.5 | 6.7 | 3.1 | 4.6 | 6.1 |
| Rise | - | - | - | - | - |
| Rival | - | 6.2 | - | 4.9 | - |
| Vantage | 3.3 | 6.7 | 3.3 | 4.3 | 5.7 |
| Venture | 3.5 | 6.7 | 3.1 | 4.7 | 5.5 |
| LSD 5% | NS | NS | NS | NS | NS |

**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 |

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 Newwhy 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 in

1992 and 1997. 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 did yield 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 |

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

| Variety | Grand Rapids | | Rosemount | | Morris |
|-----------------------------------|--------------|-----------|------------------|-----------|-----------|
| | 1994-1996 | 1999-2000 | 1993-1995 | 1998-2000 | 1993-1996 |
| Tall Fescue | | | | | |
| Barcel | 3.0 | - | 5.3 | - | 4.5 |
| Cajun | - | 6.1 | - | 5.3 | - |
| Fawn | 3.3 | - | 4.9 | - | 5.0 |
| Ky 31 | 3.5 | 5.7 | 5.8 | - | 4.7 |
| Ky 31 endophyte-free ¹ | 3.3 | - | 5.6 | 5.9 | 4.9 |
| Martin | 3.6 | 5.9 | 5.3 | 4.8 | 4.7 |
| Maximize | - | 5.8 | - | 5.1 | - |
| Mozark | 3.5 | 5.8 | 5.4 | 5.5 | 4.8 |
| Mustang | 2.7 | 5.3 | 4.7 | 4.9 | - |
| Seine | - | - | - | 5.6 | 4.8 |
| Stef | 3.3 | - | 5.3 | - | - |
| Festuca-Lolium Hybrids | | | | | |
| Kemal | - | 4.6 | - | 3.3 | - |
| Tandem II | - | 4.7 | - | 3.3 | - |
| Wheatgrasses | | | | | |
| Manska | 2.9 | - | 4.0 | - | 4.8 |
| Newwhy | 2.7 | - | 3.9 ² | 4.2 | - |
| Reliant | 3 | - | 4.2 | - | 5.0 |
| LSD 5% | 0.5 | 0.7 | 0.6 | 0.4 | NS |

¹ Endophytes are fungi that invade plant tissues, reducing forage palatability and animal performance.

² Newwhy main yield reported for 1993 and 1994. Winter injury was severe at Rosemount in 1994-1995 resulting in stand loss of Newwhy 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 Morris in 1999. Trials were harvested two or three times per year, with the majority of the yield generally in the first

cutting. 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.

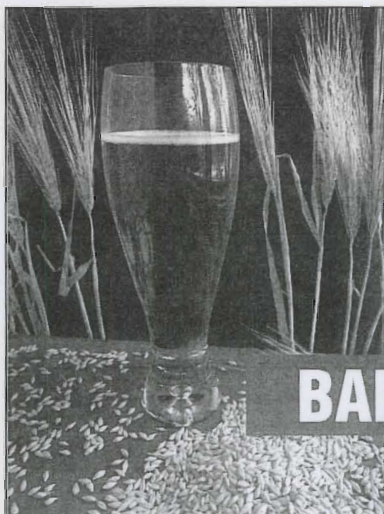
Timothy Planting Rate and Date

| | |
|-----------------------------|---------------------|
| 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 yield, tons dry matter per acre, of timothy seeded at three locations.

| Variety | Grand Rapids | | Rosemount | | Morris | Mean |
|---------------------------------------|--------------|------|-----------|------|-----------|------|
| | 1994-1996 | 2000 | 1993-1995 | 2000 | 1993-1996 | |
| Early to intermediate maturity | | | | | | |
| Aurora | | 4.3 | | 4.1 | | 4.2 |
| Climax | 3.6 | 4.2 | 3.8 | 4.4 | 4.0 | 3.9 |
| Colt | | 4.2 | | 4.8 | | 4.6 |
| Comtal | 3.4 | 3.7 | 3.7 | 3.8 | - | 3.7 |
| Goliath | 3.4 | | 3.4 | | - | 3.4 |
| Motim | | 4.1 | | 4.5 | | 4.3 |
| Promesse | | 4 | | 4 | | 4 |
| Timfor | 3.5 | | 3.8 | | - | 3.7 |
| Toro | 3.7 | | 3.9 | | - | 3.8 |
| Late maturity | | | | | | |
| Heidemij | 3.5 | | 3.0 | | 3.5 | 3.3 |
| Hokusen | 3.3 | | 3.4 | | 3.6 | 3.4 |
| LSD 5% | 0.4 | NS | 0.4 | 0.6 | NS | |

GRAIN CROPS



BARLEY

Barley varieties are compared in replicated trials at Crookston, Morris, St. Paul, Stephen and Roseau. In addition, data has been included from Dr. Jochum Wiersma's on-farm yield trials. The data collected from these trials is intended to facilitate comparisons among those varieties included. Barley varieties are listed chronologically by year of release.

Variety Selection Criteria

Most barley producers in the region grow barley with the intent to market it 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 the toxin DON.

Among these approved varieties, Robust is preferred by industry, although Excel and Foster may be purchased for malt as well. Morex, a lower-yielding variety that was dominant in the early 1980s, is included in our trials for comparison purposes. Stander was initially approved

by AMBA, but is no longer considered a malting variety. For most producers, scab

and DON in harvested grain are the most important factors limiting production of malting barley in the region. The only variety with partial resistance to scab is MNBrite; however, MNBrite is not approved by AMBA as a malting variety. Two new varieties, Lacey and Drummond, are undergoing their fourth year of AMBA quality evaluation.

General-Purpose Varieties

Foster – Medium yield and medium maturity. Good lodging resistance and kernel plumpness. Resistant to spot blotch. Six-rowed, semi-smooth awns, colorless aleurone. Has long rachilla hairs allowing grain to be distinguished from that of Robust and Stander. Classified as a

malting variety by AMBA. Discounted in the marketplace as compared to Robust. Developed by N.D. AES from crosses involving Robust, ND 5570, Glenn and Karl. Released 1995. **FVP (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. Has long rachilla hairs allowing grain to be distinguished from that of Robust and Stander. 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. **FVP**

Robust – Medium yield and medium maturity. Good lodging resistance and kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Classified as a malting variety by AMBA. Robust is currently the six-row variety of choice for malting and brewing in the Midwest. Resistant to spot blotch. Developed by Minn. AES from crosses involving Morex and Manker. Released 1983. **FVP**

Morex – Low yield and early maturity. Susceptible to lodging. Kernel plumpness intermediate. Six-rowed, semi-smooth awn, short rachilla hairs, color-

Grain yields as a percent of the trial mean, from 1998-2000 and for 2000 alone.

| Variety | Crookston | | Morris | | Stephen | | St. Paul | | Roseau | | Mean | |
|---------------|-----------|-----|--------|-----|---------|-----|----------|-----|--------|-----|-------|-----|
| | 98-00 | 00 | 98-00 | 00 | 98-00 | 00 | 98-00 | 00 | 98-00 | 00 | 98-00 | 00 |
| No. of Trials | 6 | 2 | 6 | 2 | 1 | 1 | 3 | 1 | 2 | 1 | 18 | 7 |
| Morex | 88 | 87 | 88 | 83 | 78 | 78 | 89 | 82 | 81 | 68 | 87 | 81 |
| Robust | 90 | 96 | 92 | 97 | 91 | 91 | 88 | 96 | 86 | 71 | 90 | 92 |
| Stander | 108 | 107 | 103 | 100 | 101 | 101 | 95 | 97 | 101 | 107 | 103 | 103 |
| Foster | 99 | 101 | 97 | 101 | 97 | 97 | 101 | 109 | 100 | 112 | 99 | 103 |
| MNBrite | 96 | 98 | 98 | 101 | 84 | 84 | 88 | 82 | 103 | 99 | 95 | 94 |
| Lacey | 108 | 106 | 109 | 115 | 107 | 107 | 98 | 98 | 104 | 97 | 106 | 106 |
| Drummond | 95 | 88 | 94 | 88 | 87 | 87 | 101 | 100 | 97 | 99 | 95 | 91 |
| Mean, Bu/Acre | 104 | 93 | 97 | 87 | 87 | 87 | 85 | 87 | 77 | 76 | 95 | 87 |

less aleurone. Awns may drop off as crop approaches maturity. Threshes easily. 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

Lacey – High yield and medium maturity. Good lodging resistance and kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. *Currently undergoing malting quality evaluation by AMBA.* Resistant to spot blotch. Developed by Minn. AES from crosses involving Robust, Excel and Stander. Released 2000. Plant Variety Protection. **PVP (pending)**

Drummond – Medium yield and medium maturity. Very good lodging resistance and good kernel plumpness. Six-rowed, semi-smooth awn, long rachilla hairs, colorless aleurone. *Currently undergoing malting quality evaluation by AMBA.* Resistant to spot blotch. Developed by N.D. AES from crosses involving Azure, Bumper, Hazen, and Stander. Released 2000. **PVP (pending)**

MNBrite – Medium yield and early maturity. Good lodging resistance and kernel plumpness. Provides some protection against *Fusarium* head blight (scab). It has about one-half as many scab-infected kernels per head and lower toxin (DON) levels compared to Robust or Stander. The kernels are brighter and more disease-free than other varieties, hence the name MNBrite. Resistant to spot blotch. Not approved as a malting variety by AMBA. Six-rowed, semi-smooth awns, colorless aleurone. Grain samples difficult to distinguish from Robust and Stander. Developed by Minn. AES. Released 1998. **PVP (pending)**

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. Forage quality superior 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

Agronomic traits of selected barley varieties, 1998-2000.

| Variety | Heading* | Height, In. | Lodging, % | Plump, % | Protein, % |
|---------------|----------|-------------|------------|----------|------------|
| No. of Trials | 11 | 14 | 8 | 8 | 3 |
| Morex | 56 | 36 | 41 | 69 | 13.4 |
| Robust | 56 | 37 | 38 | 75 | 13.2 |
| Stander | 57 | 33 | 32 | 81 | 13.1 |
| Foster | 56 | 35 | 40 | 78 | 12.5 |
| MNBrite | 57 | 36 | 37 | 74 | 14.0 |
| Lacey | 57 | 34 | 30 | 78 | 13.0 |
| Drummond | 56 | 35 | 26 | 73 | 12.8 |

* Days after planting

Toxin (DON, ppm) values in grain from non-inoculated (naturally infected) trials, 1996-2000.

| Variety | 1996 ¹ | 1997 ¹ | 1998 ² | 1999 ³ | 2000 ⁴ |
|---------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| No. of Trials | 2 | 2 | 11 | 2 | 3 |
| Robust | 3.6 | 3.4 | 4.7 | 2.4 | 6.6 |
| Stander | 5.8 | 7.3 | 6.6 | 4.5 | 12.8 |
| Lacey | – | 3.4 | 5.5 | 2.3 | 6.4 |
| MNBrite | 2.8 | 2.6 | 4.0 | 1.5 | 6.3 |

¹ Crookston and Stephen, advanced yield trials, ² Minnesota on-farm yield trials, Dr. Jochum Wiersma, ³ Crookston, B. Weers, ⁴ Crookston advanced, intermediate and preliminary yield trials.

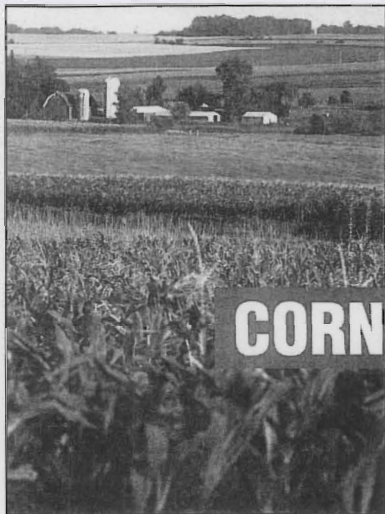
to taller barley and oat varieties, it competes less with underseeded forage legumes because of its short stature and superior lodging resistance. Resistant to spot blotch. Developed by Minn. AES from crosses involving Robust, Azure and semidwarf Minn. M32. Released 1994. **PVP**

Stander – High yield medium late maturity. Very good lodging resistance and good kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Initially classified as a malting

variety by AMBA, but has been removed from the industry approved list. 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

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 RM provided by the company. Because the University could also choose and enter hybrids in each test there may be more than six hybrids for a company in a test.

Presentation 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 2000. Hybrids are ranked within a maturity group by moisture content averaged across locations for 2000.

Least Significant Difference

We show LSD values in tables that follow 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

Companies participating in the 2000 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 5608

Brown Seed Farms Inc., 720 St Croix St., Prescott, WI, 54021

Cargill Hybrid Seeds, Box 5645, Minneapolis, MN 55440

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

Dahlman Seed Co., 73504-200th St., Dassel, MN 5532

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

Fontanelle Hybrids, Rt. 1, Box 18, Nickerson, NE 68044

Garst Seed Co., 3469 330th St., Box 500, Slater, IA

Interstate Payco Seed Co., Box 338, West Fargo, ND 58078

Hyland Seeds, Blenheim, Ontario, Canada NOP 1A0

Hy Vigor Seeds, Inc., 4970 Redwood Ave, Paullina IA 51046

J.C. Robinson Seed Co. (Golden Harvest), 100 Robinson Blvd., Waterloo, NE 69069

Jung Farms Inc., 341 So. 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

Mycogen Plant Sciences, Box 21428, 1340 Corporate Center, St. Paul, MN 55121-1428

Novartis Seeds (NK Brand), Box 959, Minneapolis, MN 55440-0959

Pioneer Hi-Bred International, Inc., 130 SE Willmar Ave, Willmar, MN 56201

Ramy International Ltd, 1329 N Riverfront Dr., Mankato, MN 56001

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

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

Terning Seeds Inc., 15365 60th St. SW., Cokato, MN 55321

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

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.

Individual trial information, 2000.

| Location | Cooperators | Previous Crop | Planting Date | Harvest Dates | Tillage | Soil Tests | | | Fertilizer Amount and Time Applied ¹ | Herbicides and Application |
|-----------|---------------|---------------|---------------|---------------|-------------------------------------|------------|--------|--------|---|---|
| | | | | | | pH | P(ppm) | K(ppm) | | |
| Lamberton | Steve Quiring | Soybean | Apr 26 | Oct 11 | Field Cultivator One pass | 6.0 | 39 | 187 | 150+0+0 fall | Frontier –PPI Hornet, Clarity – Early Post |
| Waseca | Tom Hoverstad | Soybean | Apr 26 | Oct 9 | Fall, chisel; Spring, field cult | 6.8 | 14 | 195 | 0+150+0 fall 140+0+0 spring | DoublePlay –PPI Accent Gold – Post |
| Plainview | Bruce Ihrke | Soybean | Apr 27 | Oct 18 | Fall, chisel; Spring, field cult | 7.0 | 68 | 164 | 140+0+0 | Dual – PPI Accent Gold – Post |
| Morris | George Nelson | Wheat | May 2 | Oct 13 | Fall, chisel; Spring, field cult | 7.9 | 16 | 243 | 120+46+60 fall | Surpass – Pre Hornet – Post |
| Rosemount | Jerry Holz | Soybean | May 3 | Oct 18 | Fall, chisel; Spring, field cult | – | – | – | 125+0+30 spring | Lasso – Pre Accent + Buctril – Post |
| Staples | Mel Wiens | Corn | May 17 | Oct 12 | Plow | – | – | – | 210+10+60 spring | Harness + Bladex – Pre |
| Rothsay | Troy Larson | Wheat | May 14 | Oct 20 | Fall, chisel; Spring, field cult | – | – | – | 80+80+70 | DoublePlay – PPI Hornet – Post |

¹ Pounds of N, P and K, respectively. ² Not available.

Early-maturity hybrids, southern locations, 2000.

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | | Average Across Locations | |
|------------------------------------|----------|-----|------------------------|-----------|--------|--------------------------|------------|
| | | | Lamberton | Plainview | Waseca | Bu/Acre | % Moisture |
| 97 and earlier RM hybrids | | | | | | | |
| Anderson Seeds | 7603Bt | 93 | 141 | 184 | 151 | 159 | 14.0 |
| Monsanto/Dekalb | DKC47-72 | 97 | 141 | 196 | 169 | 169 | 14.6 |
| Monsanto/Dekalb | DK440 | 94 | 136 | 189 | 149 | 158 | 14.9 |
| KSC/Challenger | K-9896 | 93 | 140 | 175 | 184 | 166 | 15.0 |
| Pioneer | 38T27 | 96 | 155 | 208 | 183 | 182 | 15.5 |
| Monsanto/Dekalb | DKC44-42 | 94 | 150 | 193 | 189 | 177 | 15.6 |
| Monsanto/Asgrow | RX452 | 97 | 146 | 199 | 170 | 172 | 15.7 |
| Garst | 8801IT | 96 | 142 | 186 | 196 | 175 | 15.8 |
| Golden Harvest | H-7387Bt | 97 | 140 | 181 | 161 | 161 | 16.2 |
| KSC/Challenger | K-9898+ | 95 | 141 | 187 | 176 | 168 | 16.5 |
| Monsanto/Asgrow | RX452YG | 97 | 153 | 194 | 164 | 170 | 16.9 |
| 97 and earlier RM averages: | | | 144 | 190 | 172 | 169 | 15.5 |
| 98 to 102 RM hybrids | | | | | | | |
| NK Brand | N43-C4 | 102 | 152 | 192 | 181 | 175 | 14.8 |
| Monsanto/Dekalb | DK507 | 100 | 158 | 206 | 169 | 178 | 14.9 |
| Jung | 2510B | 100 | 154 | 209 | 177 | 180 | 15.1 |
| Dahlman | D51-02Bt | 102 | 170 | 217 | 177 | 188 | 15.1 |
| Kruger | K-9002Bt | 99 | 161 | 210 | 186 | 186 | 15.3 |
| Dahlman | R1730Bt | 100 | 153 | 191 | 173 | 172 | 15.3 |
| Wilson | 1096 | 102 | 134 | 192 | 149 | 158 | 15.3 |
| Kruger | K-9102RR | 99 | 154 | 215 | 167 | 179 | 15.4 |
| Monsanto/Dekalb | DKC48-83 | 98 | 151 | 203 | 164 | 173 | 15.4 |
| Dahlman | 1699 | 100 | 134 | 195 | 208 | 179 | 15.4 |
| Mycogen | 2525 | 100 | 147 | 189 | 175 | 170 | 15.5 |
| Kaltenberg | K5151Bt | 102 | 164 | 220 | 178 | 187 | 15.5 |
| Viking | Bt6177 | 102 | 154 | 223 | 186 | 188 | 15.5 |
| Trelay/High Cycle | 7561RR | 100 | 140 | 198 | 167 | 168 | 15.5 |
| Ewing Seeds/Yield King | Ex.102 | 99 | 148 | 201 | 181 | 177 | 15.6 |
| Dairyland Stealth | 1504Bt | 102 | 163 | 203 | 165 | 177 | 15.6 |
| Epley Brothers | E1160 | 98 | 142 | 188 | 172 | 167 | 15.6 |
| Viking | R6160 | 102 | 155 | 221 | 161 | 179 | 15.6 |
| Renk | RK685 | 101 | 125 | 184 | 170 | 159 | 15.6 |
| Top Farm | TFSX2299 | 100 | 150 | 198 | 175 | 174 | 15.6 |

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | | Average Across Locations | |
|---|------------|-----|------------------------|-----------|--------|--------------------------|------------|
| | | | Lamberton | Plainview | Waseca | Bu/Acre | % Moisture |
| 98 to 102 RM hybrids (continued) | | | | | | | |
| Garst | N7732 | 101 | 144 | 202 | 189 | 178 | 15.7 |
| Trelay/High Cycle | 7529Bt | 102 | 142 | 212 | 194 | 183 | 15.8 |
| Monsanto/Dekalb | DKC49-92 | 99 | 149 | 192 | 167 | 169 | 15.9 |
| Trelay/High Cycle | 5700 | 98 | 156 | 184 | 162 | 167 | 15.9 |
| AgriPro Seeds | AP9355Bt | 102 | 149 | 208 | 174 | 177 | 15.9 |
| Sands SOI | 9009 | 100 | 137 | 206 | 162 | 168 | 16.0 |
| U.S. Seeds | US C1029Bt | 102 | 124 | 219 | 181 | 175 | 16.0 |
| LG Seeds | LG 2484 | 99 | 141 | 193 | 160 | 165 | 16.0 |
| Trelay/High Cycle | 5600 | 98 | 151 | 206 | 176 | 178 | 16.1 |
| U.S. Seeds | US C980 | 98 | 166 | 190 | 169 | 175 | 16.1 |
| Kruger | K-9105 | 101 | 130 | 176 | 191 | 166 | 16.1 |
| Dahlco | X-8002 | 100 | 162 | 208 | 176 | 182 | 16.2 |
| Jung | 2488A | 99 | 145 | 191 | 166 | 167 | 16.2 |
| Wensman | W5319Bt | 101 | 156 | 180 | 162 | 166 | 16.3 |
| Renk | RK606 | 100 | 136 | 183 | 173 | 164 | 16.3 |
| Kruger | K-9903Bt | 100 | 148 | 219 | 178 | 182 | 16.5 |
| Sands SOI | EXP 902-91 | 102 | 167 | 199 | 178 | 181 | 16.7 |
| Dahlman | D51-01 | 102 | 168 | 206 | 172 | 182 | 16.8 |
| Mycogen | 2566 | 102 | 161 | 181 | 176 | 173 | 16.9 |
| Mycogen | 2544IMI | 101 | 159 | 194 | 182 | 178 | 17.0 |
| Pioneer | 37M38 | 99 | 168 | 203 | 190 | 187 | 17.1 |
| Sands SOI | 9027 | 102 | 149 | 177 | 178 | 168 | 17.2 |
| Ramy International/PG | 1530 | 100 | 157 | 184 | 148 | 163 | 17.3 |
| Anderson Seeds | 6002 | 101 | 148 | 191 | 185 | 175 | 17.3 |
| Epley Brothers | E1470Bt | 102 | 161 | 199 | 168 | 176 | 17.3 |
| Monsanto/Dekalb | BK525BTY | 102 | 164 | 212 | 184 | 187 | 17.3 |
| Dairyland Stealth | 1502 | 102 | 155 | 197 | 169 | 174 | 17.3 |
| LG Seeds | LG 2488 | 100 | 141 | 202 | 182 | 175 | 17.5 |
| Kruger | K-9104 | 101 | 153 | 210 | 190 | 184 | 17.5 |
| AgriPro Seeds | AP9368 | 102 | 150 | 190 | 164 | 168 | 17.6 |
| Kaltenberg | K5123 | 102 | 166 | 213 | 167 | 182 | 17.6 |
| Viking | 6100IMI | 101 | 163 | 214 | 192 | 190 | 17.8 |
| Anderson Seeds | 6002Bt | 101 | 152 | 188 | 177 | 173 | 17.8 |
| Trelay/High Cycle | 6200 | 102 | 149 | 205 | 196 | 183 | 17.9 |
| Pioneer | 36B08 | 102 | 177 | 204 | 172 | 184 | 18.0 |
| Pioneer | 36R11 | 101 | 166 | 218 | 203 | 196 | 18.1 |
| Ewing Seeds/Yield King | YK-9002+ | 100 | 156 | 211 | 170 | 179 | 18.2 |
| Garst | 8790Bt | 100 | 111 | 203 | 186 | 167 | 18.2 |
| Wensman | W5329Bt | 102 | 162 | 197 | 192 | 183 | 18.2 |
| LG Seeds | LG 2499 | 101 | 157 | 207 | 158 | 174 | 19.4 |
| 98 to 102 RM averages: | | | 152 | 200 | 176 | 176 | 16.4 |
| 103 to 105 RM hybrids | | | | | | | |
| Monsanto/Asgrow | RX508 | 103 | 121 | 195 | 145 | 154 | 14.6 |
| Top Farm | TFSX 2203 | 105 | 133 | 176 | 153 | 154 | 14.7 |
| NK Brand | N45-T5 | 103 | 151 | 200 | 159 | 170 | 14.9 |
| Terning | TS8341Bt | 104 | 142 | 214 | 173 | 176 | 15.4 |
| Garst | N9734 | 103 | 131 | 179 | 173 | 161 | 15.4 |
| Gargill | 4521Bt | 104 | 154 | 227 | 175 | 185 | 15.6 |
| Renk | RK648 | 103 | 148 | 213 | 165 | 175 | 15.9 |
| Top Farm | TFSX 105Bt | 105 | 141 | 195 | 179 | 172 | 15.9 |
| Trelay/High Cycle | 7529Bt | 104 | 151 | 206 | 156 | 171 | 15.9 |

Early-maturity hybrids, southern locations, 2000 (continued).

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | | Average Across Locations | |
|---|-------------|-----|------------------------|-----------|--------|--------------------------|------------|
| | | | Lamberton | Plainview | Waseca | Bu/Acre | % Moisture |
| Wilson | 1099 | 105 | 138 | 207 | 166 | 170 | 16.0 |
| Viking | 5000 | 103 | 142 | 203 | 186 | 177 | 16.2 |
| NK Brand | N48-K2 | 105 | 159 | 198 | 175 | 177 | 16.2 |
| Fontanelle | 4410 | 104 | 162 | 178 | 187 | 176 | 16.3 |
| Kaltenberg | K5454Bt | 103 | 160 | 201 | 183 | 181 | 16.3 |
| Terning | TS8333 | 103 | 156 | 205 | 183 | 181 | 16.3 |
| AgriPro Seeds | AP9301IMI | 105 | 142 | 183 | 194 | 173 | 16.5 |
| Renk | RK668 | 105 | 157 | 204 | 179 | 180 | 16.7 |
| Jung | 2565 | 103 | 156 | 204 | 182 | 180 | 16.7 |
| Monsanto/Dekalb | DK537 | 103 | 164 | 223 | 181 | 189 | 16.8 |
| Top Farm | TFSX 8103RR | 103 | 150 | 195 | 185 | 177 | 16.8 |
| KSC/Challenger | K-9008 | 105 | 152 | 221 | 183 | 186 | 16.9 |
| U.S. Seeds | US C1030 | 103 | 151 | 205 | 165 | 173 | 16.9 |
| Anderson Seeds | 5028 | 104 | 149 | 194 | 185 | 176 | 16.9 |
| Kruger | Ex.908 | 104 | 149 | 212 | 181 | 181 | 17.0 |
| Viking | 5100 | 104 | 146 | 183 | 180 | 169 | 17.0 |
| Trelay/High Cycle | HC350 | 105 | 147 | 217 | 200 | 188 | 17.2 |
| Monsanto/Asgrow | RX508YG | 103 | 132 | 190 | 158 | 160 | 17.3 |
| Monsanto/Dekalb | DKC53-32 | 103 | 157 | 210 | 160 | 176 | 17.4 |
| HyVigor | 644 | 105 | 131 | 175 | 164 | 156 | 17.4 |
| Dahco | X-8054 | 105 | 153 | 208 | 168 | 176 | 17.5 |
| Mallard | UG-X2665 | 103 | 156 | 192 | 182 | 177 | 17.6 |
| KSC/Challenger | K-9109Bt | 105 | 175 | 228 | 224 | 209 | 17.8 |
| Dairyland Stealth | 1108 | 103 | 135 | 186 | 192 | 171 | 17.8 |
| LG Seeds | LG 2533 | 105 | 162 | 204 | 184 | 183 | 17.8 |
| U.S. Seeds | US C1059 | 105 | 163 | 222 | 185 | 190 | 17.8 |
| KSC/Challenger | K-9106Bt | 103 | 169 | 218 | 169 | 185 | 17.9 |
| Dahco | 2660 | 105 | 142 | 202 | 213 | 186 | 17.9 |
| Ewing Seeds/Yield King | YK-9109 | 105 | 163 | 222 | 177 | 187 | 17.9 |
| Sands SOI | 9058 | 105 | 140 | 211 | 190 | 180 | 18.0 |
| Sands SOI | 9041 | 104 | 168 | 206 | 174 | 183 | 18.1 |
| Kaltenberg | K5808 | 105 | 167 | 197 | 169 | 178 | 18.1 |
| Mycogen | 2620 | 105 | 166 | 216 | 175 | 186 | 18.1 |
| Jung | 2612 | 105 | 168 | 192 | 172 | 177 | 18.2 |
| Pioneer | 35H53 | 104 | 162 | 226 | 185 | 191 | 18.5 |
| Stautter | 2517 | 104 | 153 | 201 | 172 | 175 | 18.6 |
| LG Seeds | LG 2512 | 103 | 181 | 192 | 174 | 182 | 18.6 |
| LG Seeds | LG 2530 | 105 | 151 | 219 | 190 | 187 | 18.8 |
| U.S. Seeds | US C1051ND | 105 | 155 | 207 | 173 | 178 | 18.9 |
| Dairyland Stealth | 1606 | 105 | 146 | 222 | 209 | 193 | 18.9 |
| Trelay/High Cycle | 7001 | 105 | 150 | 197 | 221 | 189 | 19.0 |
| Ramy Int/VPG | 1540 | 105 | 155 | 199 | 190 | 181 | 19.2 |
| Garst | 8647 | 105 | 174 | 214 | 189 | 193 | 19.4 |
| KSC/Challenger | K-9806B | 103 | 172 | 208 | 180 | 187 | 19.4 |
| Golden Harvest | H-8067Bt | 104 | 158 | 201 | 178 | 179 | 20.3 |
| Dairyland Stealth | 1507 | 105 | 160 | 202 | 219 | 194 | 20.5 |
| Trelay/High Cycle | 7095 | 105 | 175 | 205 | 185 | 188 | 21.0 |
| 103 to 105 RM averages: | | | 153 | 204 | 180 | 179 | 17.4 |
| Southern locations, early-maturity averages: | | | 152 | 201 | 177 | 177 | 16.8 |
| LSD(0.20) | | | 14 | 11 | 15 | 8 | 0.6 |

Late-maturity hybrids, southern locations, 2000.

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | | Average Across Locations | |
|--|-------------|-----|------------------------|-----------|--------|--------------------------|------------|
| | | | Lamberton | Plainview | Waseca | Bu/Acre | % Moisture |
| Later than 105 RM hybrids | | | | | | | |
| Anderson Seeds | 4028 | 106 | 151 | 177 | 165 | 164 | 16.4 |
| Epley Brothers | E2422 | 108 | 133 | 199 | 168 | 166 | 16.8 |
| Jung | 2671 | 106 | 141 | 214 | 171 | 175 | 17.1 |
| Terning | TS8391 | 108 | 123 | 222 | 181 | 175 | 17.6 |
| Viking | V4121 | 107 | 155 | 189 | 170 | 171 | 17.8 |
| Mycogen | 2657 | 107 | 148 | 218 | 193 | 186 | 17.8 |
| Golden Harvest | H-8250 | 106 | 153 | 206 | 171 | 177 | 17.9 |
| Anderson Seeds | 4033 | 106 | 147 | 210 | 200 | 186 | 18.0 |
| NK Brand | N58-D1 | 110 | 150 | 219 | 174 | 181 | 18.1 |
| Garst | 8590IT | 106 | 160 | 221 | 206 | 196 | 18.1 |
| Golden Harvest | H-8123 | 106 | 158 | 217 | 187 | 187 | 18.1 |
| Cargill | 5320Bt | 106 | 158 | 226 | 157 | 181 | 18.2 |
| Kaltenberg | K6179 | 106 | 136 | 211 | 165 | 171 | 18.3 |
| Renk | RK768 | 107 | 133 | 210 | 177 | 173 | 18.3 |
| Mallard | UC-2682 | 106 | 140 | 206 | 157 | 168 | 18.3 |
| Ewing Seeds/Yield King | Yk-9108 | 106 | 158 | 206 | 190 | 185 | 18.3 |
| Anderson Seeds | 4000Bt | 106 | 151 | 183 | 166 | 167 | 18.5 |
| Pioneer | 34G82 | 106 | 160 | 220 | 185 | 188 | 18.5 |
| Monsanto/Asgrow | RX634 | 106 | 148 | 217 | 176 | 180 | 18.7 |
| Epley Brothers | E2418 | 106 | 144 | 195 | 186 | 175 | 18.8 |
| U.S. Seeds | US C1079RR | 107 | 145 | 210 | 170 | 175 | 18.8 |
| NK Brand | N59-Q9 | 107 | 132 | 202 | 193 | 176 | 18.8 |
| Brown | 7041 | 112 | 131 | 193 | 177 | 167 | 18.9 |
| AgriPro Seeds | AP9440 | 106 | 158 | 194 | 177 | 176 | 19.0 |
| Renk | RK806 | 110 | 132 | 217 | 210 | 186 | 19.1 |
| Wensman | W5359Bt | 107 | 134 | 177 | 153 | 155 | 19.4 |
| U.S. Seeds | Us C1099 | 109 | 165 | 208 | 202 | 192 | 19.6 |
| Top Farm | TFSX 7202Bt | 106 | 138 | 182 | 157 | 159 | 19.7 |
| Wensman | W4379 | 109 | 151 | 194 | 190 | 178 | 19.8 |
| Browns | 6895 | 108 | 156 | 218 | 178 | 184 | 19.9 |
| Ramy International/PG | 1590 | 109 | 156 | 202 | 178 | 179 | 20.8 |
| Ramy International/PG | 632Bt | 112 | 146 | 202 | 164 | 171 | 20.8 |
| Jung | 2710 | 110 | 157 | 198 | 175 | 177 | 20.8 |
| Ramy International/PG | 630CI | 110 | 155 | 163 | 155 | 158 | 20.9 |
| Top Farm | TFSX 2107 | 110 | 151 | 165 | 158 | 158 | 21.6 |
| Terning | TS8413Bt | 110 | 161 | 208 | 135 | 168 | 21.8 |
| Southern locations, late-maturity averages: | | | 148 | 203 | 175 | 175 | 18.9 |
| LSD(0.20) | | | 16 | 13 | 18 | 9 | 1.1 |

Early-maturity hybrids, central locations, 2000.

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | | |
|----------------------------------|-------------|----|------------------------|-----------|--------------------------|------------|--|
| | | | Morris | Rosemount | Bu/Acre | % Moisture | |
| 92 and earlier RM hybrids | | | | | | | |
| Monsanto/Dekalb | DK405 | 90 | 191 | 170 | 181 | 15.8 | |
| Top Farm | TFSX 2289 | 89 | 158 | 151 | 155 | 16.1 | |
| Top Farm | TFSX 7191Bt | 92 | 169 | 155 | 162 | 16.4 | |
| Dahlman | D45-01 | 90 | 173 | 172 | 172 | 16.5 | |
| Dahlman | 1488 | 90 | 189 | 170 | 180 | 16.6 | |
| Dahlman | 1488Bt | 90 | 168 | 163 | 166 | 16.6 | |
| Monsanto/Dekalb | DKC39-45 | 89 | 184 | 182 | 183 | 17.5 | |

Early-maturity hybrids, central locations, 2000 (continued)

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|------------------------------------|-------------|----|------------------------|-----------|--------------------------|------------|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| Kruger | Ex.87Bt | 85 | 176 | 175 | 176 | 17.7 |
| Monsanto/Dekalb | DKC42-22 | 92 | 165 | 174 | 170 | 17.9 |
| Kruger | Ex.96 | 92 | 193 | 174 | 183 | 18.2 |
| Kaltenberg | K4606 | 92 | 179 | 166 | 173 | 18.4 |
| 92 RM and earlier averages: | | | 177 | 168 | 173 | 17.1 |
| 93 to 97 RM hybrids | | | | | | |
| Seeds 2000 | 2951Bt | 96 | 177 | 164 | 171 | 16.7 |
| Dahlman | 1599Bt | 95 | 200 | 163 | 182 | 16.9 |
| Top Farm | TFSX 2295 | 97 | 189 | 178 | 184 | 17.0 |
| Wensman | W5258Bt | 95 | 195 | 176 | 185 | 17.1 |
| Top Farm | TFSX 7196Bt | 97 | 167 | 176 | 171 | 17.1 |
| Dahlco | 2394 | 94 | 192 | 165 | 179 | 17.4 |
| Jung | 2436 | 95 | 180 | 160 | 170 | 17.4 |
| Wensman | Max 007 | 93 | 174 | 169 | 172 | 17.4 |
| Epley Brothers | E1130 | 95 | 214 | 175 | 194 | 17.4 |
| Mallard | UC-2420 | 96 | 180 | 170 | 175 | 17.5 |
| Renk | RK546 | 95 | 198 | 189 | 194 | 17.5 |
| Terning | TS8266 | 96 | 171 | 163 | 167 | 17.5 |
| Interstate Payco/Garst | N7707 | 97 | 210 | 179 | 195 | 17.8 |
| KSC/Challenger | K-9896 | 93 | 183 | 159 | 171 | 17.8 |
| NK Brand | N3030Bt | 95 | 183 | 173 | 178 | 17.8 |
| Monsanto/Asgrow | RX452 | 97 | 216 | 180 | 198 | 17.8 |
| Dairyland Stealth | 1496 | 95 | 187 | 169 | 178 | 17.9 |
| Dairyland Stealth | 1596 | 96 | 188 | 171 | 179 | 17.9 |
| Dahlco | 2475 | 95 | 203 | 177 | 190 | 17.9 |
| Pioneer | 38T27 | 96 | 209 | 188 | 199 | 18.1 |
| Monsanto/Dekalb | DKC44-42 | 94 | 216 | 180 | 198 | 18.1 |
| Monsanto/Dekalb | DK440 | 94 | 177 | 179 | 178 | 18.1 |
| Pioneer | 38A24 | 96 | 201 | 182 | 191 | 18.1 |
| U.S. Seeds | US C969 | 96 | 201 | 176 | 189 | 18.1 |
| Dahlco | X-9961 | 96 | 210 | 166 | 188 | 18.2 |
| HyVigor | 3883 | 95 | 167 | 151 | 159 | 18.2 |
| Interstate Payco/Garst | 8801 | 96 | 192 | 193 | 192 | 18.3 |
| Mallard | UC-X2440 | 96 | 216 | 178 | 197 | 18.4 |
| Top Farm | TFSX 2297 | 97 | 210 | 168 | 189 | 18.4 |
| Dairyland Stealth | 1498 | 96 | 180 | 172 | 176 | 18.4 |
| Pioneer | 38P06 | 94 | 181 | 181 | 181 | 18.5 |
| Mycogen | 2424 | 95 | 189 | 174 | 182 | 18.6 |
| LG Seeds | LG 2442 | 95 | 177 | 182 | 179 | 18.6 |
| Monsanto/Asgrow | RX393YG | 95 | 177 | 160 | 168 | 18.6 |
| Hyland | HL2507 | 95 | 205 | 187 | 196 | 18.6 |
| Hyland | HL2505 | 95 | 199 | 190 | 195 | 18.7 |
| KSC/Challenger | K-9199RR | 97 | 177 | 167 | 172 | 18.7 |
| Dairyland Stealth | 1297 | 95 | 191 | 169 | 180 | 18.8 |
| Dairyland Stealth | 1099RR | 97 | 171 | 177 | 174 | 18.9 |
| Golden Harvest | H-7387Bt | 97 | 205 | 159 | 182 | 18.9 |
| Renk | RK569 | 97 | 195 | 176 | 185 | 18.9 |
| Kaltenberg | K4707 | 96 | 202 | 179 | 191 | 18.9 |
| KSC/Challenger | K-9898+ | 95 | 184 | 152 | 168 | 19.0 |
| LG Seeds | LG 2473 | 96 | 194 | 172 | 183 | 19.0 |
| Wensman | Max 127 | 97 | 167 | 179 | 173 | 19.1 |
| Brown | 4641 | 95 | 199 | 157 | 178 | 19.5 |

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|--|-------------|-----|------------------------|-----------|--------------------------|------------|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| 93 to 97 RM hybrids (continued) | | | | | | |
| Monsanto/Dekalb | DKC47-72 | 97 | 175 | 162 | 169 | 19.5 |
| HyVigor | 4884 | 95 | 159 | 177 | 168 | 19.7 |
| Pioneer | 37H26 | 97 | 191 | 182 | 186 | 19.7 |
| Hyland | HL2614 | 95 | 184 | 192 | 188 | 20.1 |
| Hyland | HIB310 | 95 | 189 | 202 | 196 | 20.1 |
| Monsanto/Asgrow | RX452YG | 97 | 173 | 166 | 170 | 21.0 |
| U.S. Seeds | US C951ND | 95 | 171 | 161 | 166 | 21.6 |
| Seeds 2000 | 2942Bt | 94 | 200 | 147 | 173 | 22.0 |
| 93 to 97 RM averages: | | | 190 | 173 | 181 | 18.5 |
| 98 and later RM hybrids | | | | | | |
| Dahlman | 1699 | 100 | 184 | 179 | 182 | 17.4 |
| Fontanelle | 3890 | 98 | 171 | 155 | 163 | 17.7 |
| Seeds 2000 | 2981 | 98 | 202 | 177 | 189 | 17.8 |
| Kruger | K-9002Bt | 99 | 188 | 179 | 183 | 17.8 |
| Epley Brothers | E1160 | 98 | 191 | 173 | 182 | 17.9 |
| Kaltenberg | K4848Bt | 100 | 192 | 175 | 184 | 18.0 |
| KSC/Challenger | K-9103 | 100 | 199 | 176 | 188 | 18.1 |
| Top Farm | TFSX 2201 | 100 | 183 | 172 | 177 | 18.2 |
| Top Farm | TFSX 8201RR | 100 | 172 | 170 | 171 | 18.3 |
| Golden Harvest | H-7212Bt | 99 | 193 | 166 | 179 | 18.4 |
| Trelay/High Cycle | 5700 | 98 | 184 | 171 | 177 | 18.6 |
| AgriPro Seeds | AP9313 | 99 | 180 | 150 | 165 | 18.7 |
| Monsanto/Dekalb | DK507 | 100 | 189 | 185 | 187 | 18.7 |
| KSC/Challenger | Ex.103 | 100 | 201 | 202 | 202 | 18.7 |
| KSC/Challenger | K-9903Bt | 100 | 190 | 188 | 189 | 18.9 |
| AgriPro Seeds | AP9291RR | 99 | 173 | 181 | 177 | 18.9 |
| Terning | TS8301Bt | 99 | 177 | 182 | 180 | 18.9 |
| Seeds 2000 | 2980RR/Bt | 98 | 191 | 177 | 184 | 18.9 |
| Fontanelle | 3391 | 99 | 185 | 163 | 174 | 18.9 |
| Trelay/High Cycle | 7525Bt | 100 | 188 | 198 | 193 | 19.0 |
| U.S. Seeds | US C980 | 98 | 190 | 173 | 181 | 19.1 |
| Monsanto/Dekalb | DKC48-83 | 98 | 194 | 172 | 183 | 19.1 |
| Dahlco | X-8002 | 100 | 205 | 173 | 189 | 19.1 |
| Dahlman | R1730Bt | 100 | 179 | 157 | 168 | 19.2 |
| Top Farm | TFSX2299 | 100 | 194 | 175 | 185 | 19.2 |
| Renk | RK606 | 100 | 183 | 194 | 189 | 19.3 |
| Jung | 2455 | 99 | 201 | 189 | 195 | 19.3 |
| U.S. Seeds | US C1001ND | 100 | 157 | 159 | 158 | 19.4 |
| Mallard | UC-2652 | 100 | 194 | 189 | 191 | 19.4 |
| Kruger | K-9002+ | 100 | 193 | 170 | 182 | 19.5 |
| Terning | TS8303 | 100 | 190 | 187 | 189 | 19.5 |
| Monsanto/Dekalb | DKC49-92 | 99 | 174 | 175 | 175 | 19.6 |
| Rainy Int'l/PG | 1530 | 100 | 182 | 177 | 180 | 19.8 |
| Wycogen | 2525 | 100 | 180 | 170 | 175 | 19.8 |
| LG Seeds | LG 2484 | 99 | 166 | 153 | 160 | 19.8 |
| Trelay/High Cycle | 5600 | 98 | 184 | 182 | 183 | 20.0 |
| Pioneer | 37M39 | 99 | 209 | 170 | 190 | 20.2 |
| Interstate Payco/Earst | 8790Bt | 100 | 199 | 190 | 195 | 20.3 |
| LG Seeds | LG 2488 | 100 | 182 | 188 | 185 | 20.4 |
| Kruger | K-9102RR | 99 | 191 | 178 | 184 | 20.6 |
| Jung | 2488A | 99 | 176 | 173 | 175 | 20.8 |
| Trelay/High Cycle | 5700 | 100 | 170 | 167 | 168 | 21.3 |

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|--|--------|----|------------------------|-----------|--------------------------|------------|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| 98 to 100 RM averages: | | | 186 | 176 | 181 | 19.1 |
| Central locations, early maturity averages: | | | 187 | 174 | 180 | 18.6 |
| LSD(0.20) | | | 16 | 16 | 11 | 0.9 |

Late maturity hybrids, central locations, 2000.

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|-------------------------------------|-------------|-----|------------------------|-----------|--------------------------|------------|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| 102 and earlier RM hybrids | | | | | | |
| Cargill | 4021Bt | 102 | 204 | 182 | 193 | 17.4 |
| Renk | RK685 | 101 | 192 | 180 | 186 | 17.5 |
| Dahlman | D51-01 | 102 | 205 | 200 | 202 | 17.6 |
| Seeds 2000 | 3110RR/Bt | 101 | 196 | 176 | 186 | 17.7 |
| Garst | N7732 | 101 | 199 | 178 | 188 | 18.1 |
| NK Brand | N43-C4 | 102 | 194 | 180 | 187 | 18.2 |
| U.S. Seeds | US C1029Bt | 102 | 194 | 186 | 190 | 18.6 |
| Wensman | W5319Bt | 101 | 177 | 183 | 180 | 18.7 |
| Kruger | K-9104 | 101 | 206 | 174 | 190 | 18.9 |
| AgriPro Seeds | AP9355Bt | 102 | 199 | 195 | 197 | 19.0 |
| Epley Brothers | E1470Bt | 102 | 185 | 172 | 179 | 19.0 |
| Garst | 8707 | 102 | 170 | 178 | 174 | 19.0 |
| Mycogen | 2544IMI | 101 | 167 | 182 | 175 | 19.0 |
| Brown | 5060 | 102 | 188 | 169 | 178 | 19.1 |
| Dahlman | D51-02Bt | 102 | 193 | 205 | 199 | 19.1 |
| Wensman | W5329Bt | 102 | 209 | 197 | 203 | 19.3 |
| Golden Harvest | H-7773Bt | 102 | 188 | 183 | 186 | 19.3 |
| Golden Harvest | H-7798Bt | 102 | 184 | 180 | 182 | 19.3 |
| Pioneer | 36R11 | 101 | 205 | 193 | 199 | 19.4 |
| AgriPro Seeds | AP9368 | 102 | 187 | 172 | 179 | 19.8 |
| Monsanto/Dekalb | DK525BtY | 102 | 179 | 223 | 201 | 20.4 |
| Cargill | 3881Bt | 101 | 195 | 195 | 195 | 20.7 |
| Dairyland Stealth | 1404 | 102 | 168 | 179 | 174 | 22.1 |
| 102 RM and earlier averages: | | | 191 | 185 | 188 | 19.0 |
| Later than 102 RM hybrids | | | | | | |
| Cargill | 4521Bt | 104 | 215 | 189 | 202 | 17.4 |
| NK Brand | N45-T5 | 103 | 195 | 184 | 189 | 18.1 |
| Top Farm | TFSX 8103RR | 103 | 184 | 180 | 182 | 18.4 |
| NK Brand | N48-K2 | 105 | 187 | 184 | 185 | 18.4 |
| Terning | TS8341Bt | 104 | 205 | 192 | 199 | 18.7 |
| Garst | N9734 | 103 | 192 | 174 | 183 | 19.1 |
| Terning | TS8333 | 103 | 197 | 176 | 187 | 19.3 |
| Jung | 2565 | 103 | 192 | 188 | 190 | 19.4 |
| Kaltenberg | K5454Bt | 103 | 191 | 195 | 193 | 19.5 |
| U.S. Seeds | US C1030 | 103 | 191 | 184 | 188 | 19.6 |
| Brown | 6341 | 105 | 191 | 174 | 183 | 19.7 |
| U.S. Seeds | US C1059 | 105 | 197 | 183 | 190 | 19.7 |
| Monsanto/Asgrow | RX508YG | 103 | 168 | 193 | 181 | 20.0 |
| Monsanto/Dekalb | DKC53-32 | 103 | 203 | 164 | 183 | 20.4 |
| Dahlco | X-8054 | 105 | 194 | 191 | 192 | 20.7 |
| U.S. Seeds | US C1051ND | 105 | 180 | 179 | 180 | 21.4 |
| Ramy International/PG | 1540 | 105 | 192 | 161 | 177 | 21.5 |

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|---|--------|----|------------------------|-----------|--------------------------|------------|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| Later than 102 RM averages: | | | 193 | 182 | 187 | 19.5 |
| Central locations, late maturity averages: | | | 191 | 184 | 188 | 19.2 |
| LSD(0.20) | | | 16 | 16 | 11 | 0.9 |

Northern locations, 2000.

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|------------------------------------|-----------|----|------------------------|---------|--------------------------|------------|
| | | | Rothsay | Staples | Bu/Acre | % Moisture |
| 77 and earlier RM hybrids | | | | | | |
| NK Brand | N09-A4 | 74 | 153 | 124 | 138 | 23.1 |
| Dairyland Stealth | 1277 | 77 | 158 | 144 | 151 | 23.3 |
| Hyland | HL2093 | 75 | 141 | 106 | 124 | 23.8 |
| Top Farm | TFSX 2175 | 77 | 146 | 119 | 132 | 24.5 |
| 77 RM and earlier averages: | | | 149 | 123 | 136 | 23.7 |
| 78 to 82 RM hybrids | | | | | | |
| Monsanto/Dekalb | DK307 | 80 | 146 | 139 | 142 | 20.2 |
| Ramy International/PG | 1313 | 80 | 158 | 141 | 150 | 22.8 |
| Jung | 2240 | 80 | 157 | 144 | 151 | 23.0 |
| Dairyland Stealth | 1480 | 80 | 142 | 140 | 141 | 23.1 |
| Hyland | HL2222 | 80 | 146 | 137 | 142 | 23.5 |
| Mycogen | 2141 | 81 | 135 | 155 | 145 | 23.7 |
| Hyland | HL2307 | 80 | 145 | 162 | 154 | 24.1 |
| NK Brand | N17-R3 | 82 | 154 | 161 | 157 | 24.2 |
| Jung | 2178 | 78 | 119 | 104 | 111 | 24.6 |
| Hyland | HL2333 | 80 | 138 | 139 | 138 | 24.8 |
| Wensman | W5018Bt | 80 | 141 | 133 | 137 | 25.5 |
| 78 to 82 RM averages: | | | 144 | 141 | 143 | 23.6 |
| 83 to 87 RM hybrids | | | | | | |
| Mycogen | 2191 | 83 | 167 | 126 | 147 | 21.1 |
| Renk | RK232 | 85 | 158 | 159 | 158 | 22.8 |
| Dairyland Stealth | 1585 | 85 | 145 | 163 | 154 | 23.1 |
| Dahlco | X-9861 | 85 | 170 | 149 | 159 | 23.3 |
| Brown | 1967 | 83 | 143 | 152 | 147 | 23.4 |
| Pioneer | 39D81 | 85 | 158 | 139 | 149 | 24.0 |
| Kaltenberg | K3303 | 84 | 151 | 158 | 154 | 24.2 |
| Wensman | W5048Bt | 83 | 155 | 163 | 159 | 24.2 |
| Interstate Payco/Garst | 8972IT | 87 | 144 | 136 | 140 | 24.3 |
| Dahlman | 1300Bt | 85 | 161 | 154 | 158 | 24.3 |
| Kruger | Ex.87 | 85 | 156 | 158 | 157 | 24.3 |
| Monsanto/Dekalb | DK355 | 85 | 135 | 140 | 138 | 24.3 |
| Top Farm | TFSX 2184 | 85 | 156 | 151 | 154 | 24.3 |
| Seeds 2000 | 2871Bt | 87 | 152 | 152 | 152 | 24.4 |
| Dairyland Stealth | 1485 | 85 | 161 | 161 | 161 | 24.5 |
| Monsanto/Dekalb | DK334BtY | 83 | 137 | 145 | 141 | 24.5 |
| Mycogen | 2242 | 86 | 155 | 151 | 153 | 24.6 |
| Jung | 2233 | 85 | 159 | 142 | 150 | 24.7 |
| Ramy International/PG | 1356 | 86 | 141 | 147 | 144 | 24.9 |
| AgriPro Seeds | AP9090 | 85 | 156 | 114 | 135 | 25.0 |
| LG Seeds | LG 2367 | 85 | 126 | 142 | 134 | 25.1 |
| Jung | 2285 | 85 | 152 | 139 | 145 | 25.3 |
| Trelay/High Cycle | 2009 | 87 | 154 | 159 | 156 | 25.4 |
| Interstate Payco/Garst | N8956 | 87 | 156 | 146 | 151 | 25.4 |

Northern locations, 2000 (continued).

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|--------------------------------|-------------|----|------------------------|---------|--------------------------|------------|
| | | | Rothsay | Staples | Bu/Acre | % Moisture |
| Golden Harvest | H-6229 | 84 | 145 | 133 | 139 | 25.5 |
| Kruger | Ex.87Bt | 85 | 162 | 165 | 163 | 25.9 |
| Wensman | W5088Bt | 85 | 141 | 144 | 142 | 26.0 |
| NK Brand | N17-C5 | 84 | 144 | 152 | 148 | 26.2 |
| AgriPro Seeds | AP9111 | 86 | 144 | 152 | 148 | 26.2 |
| Top Farm | TFSX 7187Bt | 87 | 138 | 130 | 134 | 27.5 |
| 83 to 87 RM averages: | | | 151 | 147 | 149 | 24.6 |
| 88 to 92 RM hybrids | | | | | | |
| Kaltenberg | K3456 | 89 | 142 | 129 | 135 | 23.5 |
| Monsanto/Dekalb | DK405 | 90 | 146 | 168 | 157 | 23.9 |
| Top Farm | TFSX 2289 | 89 | 149 | 131 | 140 | 24.0 |
| Mycogen | 2249IMI | 89 | 147 | 156 | 152 | 24.2 |
| Pioneer | 38K07 | 92 | 147 | 163 | 155 | 24.3 |
| Golden Harvest | H-6573 | 92 | 135 | 155 | 145 | 24.5 |
| Mallard | UC-X2415 | 90 | 136 | 129 | 132 | 24.6 |
| NK Brand | N2555Bt | 90 | 143 | 163 | 153 | 24.6 |
| Seeds 2000 | 2892 | 89 | 127 | 154 | 141 | 24.6 |
| Mallard | UC-X2400 | 90 | 144 | 141 | 142 | 24.7 |
| Dahlco | X-8891 | 89 | 137 | 142 | 140 | 24.7 |
| Jung | 2370 | 89 | 132 | 164 | 148 | 25.0 |
| Kaltenberg | K2909 | 88 | 147 | 137 | 142 | 25.4 |
| Terning | TS8202 | 90 | 142 | 135 | 138 | 25.5 |
| NK Brand | N27-M3 | 91 | 140 | 168 | 154 | 25.5 |
| Dairyland Stealth | 1089Bt | 90 | 155 | 147 | 151 | 25.6 |
| Monsanto/Dekalb | DKC39-45 | 89 | 115 | 162 | 139 | 25.6 |
| Dahlman | D45-01 | 90 | 155 | 137 | 146 | 25.7 |
| Kruger | Ex.092 | 90 | 147 | 123 | 135 | 26.0 |
| U.S. Seeds | US C909 | 90 | 150 | 139 | 145 | 26.0 |
| AgriPro Seeds | AP9156 | 90 | 117 | 123 | 120 | 26.1 |
| Dahlman | 1488 | 90 | 137 | 164 | 151 | 26.1 |
| Pioneer | 38J54 | 91 | 118 | 151 | 134 | 26.2 |
| Dahlco | 2336 | 90 | 143 | 137 | 140 | 26.5 |
| U.S. Seeds | US C901ND | 90 | 140 | 142 | 141 | 26.5 |
| Top Farm | TFSX 7191Bt | 92 | 143 | 116 | 129 | 26.5 |
| Brown | 2080 | 89 | 165 | 145 | 155 | 26.7 |
| Dahlman | 1488Bt | 90 | 141 | 134 | 138 | 26.8 |
| Mallard | UC-X2300 | 89 | 146 | 148 | 147 | 27.2 |
| LG Seeds | LG 2307 | 90 | 146 | 150 | 148 | 27.2 |
| KSC/Challenger | K-2094 | 92 | 129 | 123 | 126 | 27.2 |
| Monsanto/Dekalb | DKC42-22 | 92 | 148 | 153 | 151 | 27.4 |
| Dairyland Stealth | 1490 | 90 | 144 | 124 | 134 | 27.7 |
| Pioneer | 38W36 | 92 | 170 | 164 | 167 | 27.7 |
| Renk | RK394 | 90 | 146 | 137 | 142 | 28.3 |
| 88 to 92 RM averages: | | | 142 | 144 | 143 | 25.8 |
| 93 and later RM hybrids | | | | | | |
| Jung | 2436 | 95 | 144 | 185 | 165 | 22.9 |
| Golden Harvest | H-6800Bt | 94 | 136 | 159 | 148 | 23.9 |
| Brown | 4641 | 95 | 113 | 147 | 130 | 24.6 |
| NK Brand | N3030Bt | 95 | 150 | 170 | 160 | 24.7 |
| Jung | 2430 | 94 | 124 | 159 | 141 | 25.6 |
| Pioneer | 38T27 | 96 | 156 | 153 | 154 | 25.8 |
| KSC/Challenger | K-9896 | 93 | 140 | 158 | 149 | 26.1 |

| Source / Brand | Hybrid | RM | Yield, Bushels/Acre at | | Average Across Locations | |
|--|-----------|----|------------------------|---------|--------------------------|------------|
| | | | Rothsay | Staples | Bu/Acre | % Moisture |
| 93 and later RM hybrids (continued) | | | | | | |
| Wensman | Max 007 | 93 | 150 | 138 | 144 | 26.3 |
| Pioneer | 38P06 | 94 | 168 | 163 | 166 | 26.8 |
| Monsanto/Dekalb | DK440 | 94 | 152 | 147 | 149 | 27.2 |
| Mycogen | 2424 | 95 | 119 | 152 | 135 | 27.3 |
| Wensman | W5258Bt | 95 | 151 | 150 | 151 | 27.4 |
| Monsanto/Asgrow | RX393YG | 95 | 144 | 128 | 136 | 27.5 |
| AgriPro Seeds | AP9185Bt | 93 | 178 | 122 | 150 | 27.7 |
| Seeds 2000 | 2951Bt | 96 | 131 | 142 | 136 | 28.6 |
| Kruger | K-9898+ | 95 | 130 | 158 | 144 | 28.8 |
| AgriPro/Garst | 8830 | 95 | 156 | 142 | 149 | 29.2 |
| Dahlman | 1599Bt | 95 | 152 | 142 | 147 | 29.9 |
| U.S. Seeds | US C951ND | 95 | 149 | 133 | 141 | 30.3 |
| Kruger | K-9199RR | 97 | 135 | 148 | 142 | 30.6 |
| Monsanto/Dekalb | DKC44-42 | 94 | 139 | 135 | 137 | 30.9 |
| 93 and later RM averages: | | | 144 | 149 | 146 | 27.2 |
| Northern locations averages: | | | 145 | 145 | 145 | 25.4 |
| LSD(0.20) | | | 15 | 16 | 11 | 2.2 |

Corn Planting Rate and Date

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

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@mn.com

Northern Minnesota Bluegrass Growers Association
 31154 450th Avenue
 Roseau, MN 56751-8413
 Phone 218-463-2119

Minnesota Barley Growers Association and Minnesota Barley 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

Minnesota Corn Growers Association and Minnesota Corn Research and Promotion Council
 738 First Avenue East
 Shakopee, MN 55379
 Phone: 612-233-0333
 Fax: 612-233-0420
 E-mail: info@macorn.org

Minnesota Crop Improvement Association
 1900 Hendon Avenue
 St. Paul, MN 55108
 Phone: 612-625-7766
 Fax: 612-625-3748
 E-mail: beilx001@gold.tc.umn.edu
 Web Address: http://www.mcia.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 Seed Producers and Promotion Association
 Mac Ehrhardt, Secretary
 P.O. Box 127
 Albert Lea, MN 56007
 Phone: 507-373-3161

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



CORN SILAGE

The Minnesota Hybrid Corn Silage Evaluation Program was initiated as a test to evaluate corn hybrids intended for use as silage. The program's unbiased forage yield and quality information 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 enter hybrids for testing.

Test Sites

Trials were conducted at Rosemount and Waseca in 2000.

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 September 6 for the early and September 12 for the late RM group. Harvest at Rosemount was on September 7 for both the early and late RM groups. After grain maturation two rows adjacent to those sampled

for silage were harvested for grain and yields adjusted to 15.5% moisture.

Test Results

Moisture content, grain yields, whole-plant dry matter (DM) and silage yields, crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), and in vitro digestible dry matter (IVDDM) concentrations are given for entries in each RM group. Means and least significant difference (LSD) data at 10% probability are shown for each RM group and at each location. While they are ranked by average moisture content, hybrids differ in dry matter, silage and grain yields, and effect on milk production. There was little difference in forage quality parameters (CP, ADF, NDF and IVDDM).

ADF and NDF are negative indicators of forage digestibility and intake respectively. Lower ADF and NDF numbers are related to better animal performance. IVDDM is a laboratory test to estimate digestibility in ruminant livestock.

Companies participating in the 2000 hybrid corn silage trials.

- Albert Lea Seed House, 1414 W. Main, P.O. Box 127, Albert Lea, MN 56007
- Dairyland Seed Company, Inc., P.O. Box 958, West Bend, WI 53095-0958
- Epley Brothers Hybrids, 22494 Yale Avenue, P.O. Box 310, Shell Rock, IA 50670
- The J.C. Robinson Seed Company, Golden Harvest Seeds, P.O. Box A, Waterloo, NE 68069
- Monsanto, 3100 Sycamore Road, De Kalb, IL 60115
- Ramy International Ltd, 1329 North Riverfront Drive., Mankato, MN 56001
- Renk Seed Company, R-2 6800 Wilburn Road., Sun Prairie, WI 53590-0958
- Trelay Seed Company, 11623 Hwy 80, Livingston, WI 53554-9799
- Wensman Seed Company, P.O. Box 190, Wadena, MN 56482

Moisture, yield and quality traits for Early relative maturity (RM) corn hybrids at Waseca, 2000.

| Brand | Hybrid | RM | Moisture, % | Yield Per Acre ¹ | | | Concentration, Percent ² | | | | Milk ³ | |
|--------------------------|----------------------------|-----|-------------|-----------------------------|----------|--------------|-------------------------------------|-----|-----|-------|-------------------|--------|
| | | | | Grain, Bushels | DM, Tons | Silage, Tons | CP | ADF | NDF | IVDDM | Ton | Acre |
| Dairyland | Stealth 1406 | 105 | 59.3 | 158 | 9.9 | 24.4 | 6.8 | 23 | 38 | 65 | 1,634 | 16,149 |
| Epley | E5105-S | 105 | 60.1 | 137 | 8.5 | 21.3 | 6.6 | 25 | 42 | 62 | 1,275 | 10,793 |
| DeKalb | DK C49-92 | 99 | 61.1 | 145 | 7.7 | 20.1 | 6.7 | 23 | 38 | 64 | 1,584 | 12,247 |
| Pioneer | 36R11 (check) ⁴ | 101 | 61.3 | 171 | 9.6 | 24.9 | 6.9 | 24 | 40 | 63 | 1,451 | 13,938 |
| Asgrow | RX508YG | 103 | 61.8 | 141 | 7.6 | 19.9 | 6.8 | 24 | 39 | 64 | 1,526 | 11,569 |
| Trelay | 6900 | 103 | 63.0 | 164 | 9.1 | 24.7 | 6.5 | 23 | 38 | 64 | 1,567 | 14,240 |
| Dairyland | Stealth 1606 | 105 | 65.3 | 179 | 9.0 | 26.0 | 6.2 | 24 | 39 | 64 | 1,543 | 13,872 |
| Trelay | 7095 | 105 | 65.5 | 185 | 10.1 | 29.3 | 6.8 | 24 | 40 | 65 | 1,512 | 15,253 |
| High Cycle | 660 InE | 105 | 66.9 | 162 | 9.3 | 27.9 | 7.0 | 25 | 42 | 62 | 1,255 | 11,514 |
| Early RM averages | | | 62.7 | 160 | 9.0 | 24.3 | 6.7 | 24 | 39 | 64 | 1,483 | 13,297 |
| LSD (0.10) | | | 2.0 | 26 | 0.7 | 1.9 | ns | ns | ns | 2 | | |

See footnotes with the table that follows.

Moisture, yield and quality traits for Late relative maturity (RM) corn hybrids at Waseca, 2000.

| Brand | Hybrid | RM | Moisture, % | Yield Per Acre ¹ | | | Concentration, Percent ² | | | | Milk ³ | |
|-------------------------|----------------------------|-----|-------------|-----------------------------|----------|--------------|-------------------------------------|-----|-----|-------|-------------------|--------|
| | | | | Grain, Bushels | DM, Tons | Silage, Tons | CP | ADF | NDF | IVDDM | Ton | Acre |
| Renk | RK 775 | 108 | 56.1 | 160 | 8.1 | 18.5 | 6.6 | 22 | 37 | 64 | 1,609 | 13,070 |
| Dairyland | Stealth 1508 | 108 | 61.0 | 181 | 8.2 | 20.9 | 6.5 | 23 | 37 | 64 | 1,570 | 12,803 |
| Viking | 4004 | 110 | 63.2 | 164 | 6.9 | 18.9 | 6.3 | 22 | 36 | 65 | 1,701 | 11,797 |
| Dairyland | Stealth 1507 | 106 | 63.4 | 169 | 8.8 | 24.0 | 6.9 | 23 | 38 | 65 | 1,631 | 14,332 |
| Golden Harvest | H-2547 | 112 | 65.6 | 168 | 7.6 | 22.3 | 6.7 | 21 | 35 | 66 | 1,785 | 13,550 |
| Pioneer | 34G82 (check) ⁴ | 106 | 66.7 | 169 | 6.5 | 19.9 | 6.7 | 23 | 36 | 64 | 1,649 | 10,721 |
| Dekalb | DK C57-38 | 107 | 67.1 | 172 | 6.9 | 21.3 | 7.0 | 23 | 39 | 64 | 1,528 | 10,500 |
| Epley | E 5112 S | 112 | 67.9 | 152 | 7.3 | 22.9 | 6.6 | 23 | 37 | 65 | 1,662 | 12,157 |
| Dairyland | Stealth 1609 | 108 | 69.0 | 181 | 9.0 | 29.2 | 6.6 | 23 | 39 | 65 | 1,581 | 14,238 |
| Epley | E 5110 S | 110 | 69.2 | 148 | 7.5 | 24.6 | 7.0 | 24 | 41 | 62 | 1,311 | 9,843 |
| Late RM averages | | | 64.9 | 167 | 7.7 | 22.3 | 6.7 | 23 | 38 | 64 | 1,603 | 12,301 |
| LSD (0.10) | | | 5.5 | ns | 1.1 | 2.1 | ns | ns | 3 | ns | | |

¹ Whole-plant (WP) corn harvested early September. 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 "Test Results" text for description. ³ Estimates of animal performance showing milk yield per ton of silage and per acre of cropland for a standard cow weight and milk production level (Milk 95, U of Wis.). ⁴ Standard check entry.

Moisture, yield and quality traits for Early relative maturity (RM) corn hybrids at Rosemount, 2000.

| Brand | Hybrid | RM | Moisture, % | Yield Per Acre ¹ | | | Concentration, Percent ² | | | | Milk ³ | |
|--------------------------|---------------------------|----|-------------|-----------------------------|----------|--------------|-------------------------------------|-----|-----|-------|-------------------|--------|
| | | | | Grain, Bushels | DM, Tons | Silage, Tons | CP | ADF | NDF | IVDDM | Ton | Acre |
| Dekalb | DK 355 | 85 | 53.8 | 154 | 8.3 | 17.9 | 7.2 | 24 | 40 | 62 | 1,329 | 11,012 |
| Dairyland | tealth 1203 | 99 | 61.3 | 160 | 9.9 | 25.6 | 6.6 | 25 | 42 | 62 | 1,260 | 12,452 |
| Dairyland | Stealth 1297 | 96 | 62.1 | 172 | 9.6 | 25.4 | 6.8 | 24 | 40 | 63 | 1,401 | 13,503 |
| Wensman | W 5308Bt | 95 | 62.6 | 176 | 10.2 | 27.5 | 6.5 | 24 | 42 | 63 | 1,360 | 13,917 |
| Pioneer | 3730 (check) ⁴ | 99 | 62.9 | 175 | 10.5 | 28.4 | 6.7 | 25 | 43 | 62 | 1,207 | 12,686 |
| Dekalb | DK C42-22 | 92 | 63.2 | 183 | 9.7 | 26.5 | 6.7 | 25 | 43 | 62 | 1,185 | 11,522 |
| Trelay | 5700 | 98 | 65.1 | 159 | 10.0 | 28.7 | 7.0 | 25 | 44 | 62 | 1,187 | 11,847 |
| Early RM averages | | | 61.6 | 168 | 9.8 | 25.7 | 6.8 | 25 | 42 | 62 | 1,276 | 12,420 |
| LSD (0.10) | | | 2.1 | 17 | 0.8 | 2.1 | ns | 1 | 2 | ns | | |

See footnotes with the table below.

Moisture, yield and quality traits for Late relative maturity (RM) corn hybrids at Rosemount, 2000.

| Brand | Hybrid | RM | Moisture, % | Yield Per Acre ¹ | | | Concentration, Percent ² | | | | Milk ³ | |
|-------------------------|----------------------------|-----|-------------|-----------------------------|----------|--------------|-------------------------------------|-----|-----|-------|-------------------|--------|
| | | | | Grain, Bushels | DM, Tons | Silage, Tons | CP | ADF | NDF | IVDDM | Ton | Acre |
| Renk | RK 775 | 108 | 61.9 | 159 | 10.2 | 26.8 | 6.1 | 26 | 45 | 60 | 1,027 | 10,457 |
| Renk | RK 685 | 100 | 63.4 | 171 | 9.2 | 25.1 | 6.6 | 26 | 46 | 60 | 970 | 8,933 |
| Renk | RK 606 | 100 | 64.0 | 169 | 9.3 | 26.0 | 6.6 | 25 | 43 | 61 | 1,181 | 10,988 |
| Wensman | W 5378Bt | 100 | 65.1 | 154 | 9.4 | 27.1 | 6.3 | 26 | 45 | 59 | 976 | 9,206 |
| Pioneer | 36R11 (check) ⁴ | 101 | 65.3 | 190 | 9.3 | 27.0 | 6.7 | 26 | 46 | 60 | 984 | 9,164 |
| Dairyland | Stealth 1508 | 108 | 66.1 | 170 | 9.8 | 28.8 | 5.8 | 27 | 46 | 60 | 968 | 9,451 |
| Ramy | PG 1540 | 105 | 66.3 | 159 | 8.8 | 26.0 | 6.8 | 24 | 42 | 62 | 1,281 | 11,235 |
| Golden Harvest | H-8250 | 106 | 66.5 | 174 | 9.6 | 28.9 | 6.3 | 26 | 44 | 61 | 1,130 | 10,886 |
| Trelay | 6900 | 103 | 67.7 | 159 | 9.9 | 30.6 | 6.8 | 25 | 43 | 62 | 1,199 | 11,827 |
| Late RM averages | | | 65.1 | 167 | 9.5 | 27.4 | 6.5 | 26 | 44 | 60 | 1,080 | 10,239 |
| LSD (0.10) | | | 2.2 | ns | 0.7 | 1.8 | 0.5 | 1 | 2 | 2 | | |

¹ Whole-plant (WP) corn harvested early September. 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 "Test Results" text for description. ³ Estimates of animal performance showing milk yield per ton of silage and per acre of cropland for a standard cow weight and milk production level (Milk 95, U of Wis.). ⁴ Standard check entry.



OAT

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. 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.

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.

This year we divided the rust reading into columns beneath "Crown Rust" headed "Amount" 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 indicates 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.

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)

Blaze – Medium maturity, high yield, medium height, good lodging resistance, very high test weight and groat percentage. Ivory seed. Susceptible to crown rust and smut, very tolerant to red leaf. Selected at Ill. AES. Released in 1997. Because of smut susceptibility, planting only treated seed is recommended. **PVP** (pending)

Chaps – Medium maturity, high yield, medium height, good lodging resistance, high test weight and medium groat percentage. Yellow seed. Susceptible to crown rust and smut, tolerant to red leaf. Selected at Ill. AES. Released in 1997. Because of smut susceptibility, planting only treated seed is recommended. **PVP** (pending)

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 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)

Jay – Medium maturity, high yield, short, very good lodging resistance, medium test weight and groat percentage. Ivory seed. Resistant to crown rust, susceptible to smut, some tolerance to

Oat yield, bushels/acre by location, 1998-2000.

| Variety | Rosemount | Waseca*** | Lamberton | Morris | Crookston | Grand Rapids**** | Average |
|----------------|-----------|-----------|-----------|--------|-----------|------------------|---------|
| Dane**** | 60 | 58 | 73 | 111 | 120 | 68 | 82 |
| Chaps | 81 | 94 | 103 | 167 | 120 | 106 | 112 |
| Jay | 80 | 84 | 91 | 169 | 129 | 85 | 106 |
| Richard | 84 | 85 | 109 | 154 | 127 | 98 | 110 |
| Rodeo | 90 | 88 | 109 | 176 | 133 | 102 | 116 |
| Gem | 81 | 90 | 117 | 160 | 123 | 94 | 111 |
| Vista** | 99 | 98 | 112 | 137 | 125 | 110 | 114 |
| Milton | 80 | 79 | 100 | 153 | 130 | 92 | 106 |
| Young* | 87 | 88 | 107 | 157 | 140 | 91 | 112 |
| Jud | 79 | 76 | 119 | 141 | 116 | 100 | 105 |
| Belle | 80 | 87 | 108 | 144 | 125 | 86 | 105 |
| Loyal | 76 | 88 | 106 | 139 | 125 | 91 | 104 |
| Ebeltoft* | 90 | 94 | 102 | 165 | 138 | 122 | 119 |
| Paul | 42 | 54 | 84 | 92 | 95 | 29 | 66 |
| AC Assiniboia* | 82 | 94 | 124 | 176 | 126 | 82 | 114 |
| Triple Crown** | 66 | 97 | 82 | 133 | 141 | 86 | 101 |
| LSD | 7 | 12 | 15 | 18 | 13 | 15 | 6 |

*2000 data only. **1999 & 2000 data only. ***1998 & 1999 data only. ****1998 & 2000 data only.

red leaf. Selected at Purdue AES. Released in 1998. Because of smut susceptibility, planting only treated seed is recommended. **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 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. **PVP (pending)**

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 S.D. AES. Released in 2000.

Milton – Medium-late maturity, high yield, medium height, good lodging re-

sistance, 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. **PVP (pending)**

Oat yield, bushels/acre at off-station locations, 2000 only.

| Variety | Roseau | Stephen | Winona* | Wells* | Madison* |
|---------------|--------|---------|---------|--------|----------|
| Riser | – | – | 83 | 75 | 27 |
| Richard | 101 | 119 | 113 | 109 | 88 |
| Dane | 97 | 108 | 80 | 88 | 34 |
| Gem | 88 | 128 | 121 | 98 | 68 |
| Rodeo | 120 | 132 | 118 | 108 | 63 |
| Chaps | 102 | 134 | 98 | 112 | 55 |
| Jay | 102 | 123 | 122 | 99 | 41 |
| Jud | 118 | 131 | 58 | 103 | 56 |
| Vista | 86 | 135 | 90 | 123 | 70 |
| Ebeltoft | 136 | 152 | – | – | – |
| Milton | 107 | 127 | 105 | 116 | 60 |
| Loyal | 120 | 127 | 64 | 106 | 56 |
| Belle | 106 | 124 | 101 | 102 | 61 |
| Paul | 103 | 105 | 72 | 58 | 41 |
| Triple Crown | 127 | 158 | 67 | 85 | 72 |
| AC Assiniboia | 126 | 143 | 92 | 86 | 86 |
| Youngs | 112 | 143 | – | – | – |
| LSD | 15 | 18 | 19 | 27 | 13 |

* These locations are pesticide-free/organic farmer fields and Madison is planted no-till.

Oat traits, 1998-2000; disease data 2000 only.

| Variety | Days After Planting To Heading | Height, Inches | Lodging, | | Test Weight, Lb/Eu | Groat % | Crown Rust | | Smut Score ² | BYDV Score ³ |
|-----------------|--------------------------------|----------------|-------------------|--|--------------------|---------|------------|----------------------------|-------------------------|-------------------------|
| | | | 1=Erect 5=Flat | | | | Amount | Reaction Type ¹ | | |
| Dane**** | 56 | 34 | 2.5 | | 36 | 72 | 20 | MR-MS | R | 8 |
| Chaps | 60 | 36 | 2.5 | | 38 | 70 | 20 | MS-S | S | 4 |
| Jay | 60 | 32 | 1.6 | | 38 | 70 | 5 | S | S | 7 |
| Richard | 60 | 39 | 1.9 | | 39 | 71 | 5 | MR-MS | R | 4 |
| Rodeo | 61 | 37 | 2.0 | | 37 | 72 | 20 | MS-S | S | 6 |
| Gem | 61 | 37 | 2.5 | | 38 | 72 | 5 | MS-S | MR | 6 |
| Vista | 62 | 39 | 2.7 | | 38 | 70 | <1 | MS | R | 7 |
| Milton | 63 | 35 | 2.0 | | 37 | 71 | 10 | MR-MS | MR | 8 |
| Youngs* | 64 | 39 | 2.0 | | 39 | 72 | <1 | MS | S | 7 |
| Jud | 85 | 42 | 3.2 | | 40 | 73 | 5 | MS-S | R | 5 |
| Belle | 65 | 38 | 2.5 | | 39 | 74 | <1 | MS-S | MR | 8 |
| Loyal | 66 | 41 | 2.7 | | 39 | 71 | <1 | MS-S | MR | 7 |
| Ebeltoft* | 66 | 34 | 1.9 | | 38 | 71 | <1 | MS-S | MR | 5 |
| Paul (hullless) | 66 | 40 | 2.3 | | 43 | 95 | <1 | S | R | 7 |
| AC Assiniboia* | 66 | 37 | 1.6 | | 40 | 74 | <1 | HR | R | 4 |
| Triple Crown** | 67 | 41 | 1.6 | | 36 | 68 | <1 | S | MR | 8 |
| Mean | 63 | 38 | 2.2 | | 39 | 73 | | | | |

* 2000 data only. **1999 and 2000 data only. *** 1998 & 1999 data only. **** 1998 & 2000 data only.

¹HR=highly resistant R= resistant MR=moderately resistant, MS=moderately susceptible S=susceptible. ²R=resistant MR=moderately resistant MS=moderately susceptible S=susceptible. ³Barley yellow dwarf virus, 1=no symptoms, 9=dead



Location of oat trials.

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 the Minn. AES. Released in 2000.

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)**

Starter – Early maturity, lower yield, short, fair lodging resistance, medium test weight and groat percentage, medium protein percentage. Yellow seed. Susceptible to crown rust and red leaf, resistant to smut. Selected at Minn. AES. Released in 1986. Well suited for companion cropping. **PVP**

2107 – 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 the S.D. AES. Released in 1991.

Special-Purpose Varieties

Pal – Forage establishment only. Medium-late maturity, low grain yield, very short, good lodging resistance, low test weight, medium groat percentage, yellow seed. Moderately susceptible to crown rust, resistant to smut, susceptible to red leaf. Selected at Minn. AES. Released in 1994 as a special-purpose forage oat variety. Pal has good forage yield with high levels of crude protein and good relative feed value, although no forage data are provided in this publication.

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. **PVP (pending)**

Triple Crown – Late maturity, medium yield, tall, very good lodging resistance, low test weight and groat percentage. White seed. Resistant to crown rust, moderately resistant to smut and susceptible to red leaf. Selected by the Svalöf Weibull Seed Company and distributed by Svalöf Weibull Seed Company, Lindsay, Ontario, Canada. The company can be contacted at www.swseed.ca.

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)**

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. **PVP (pending)**

Oat Planting Rate and Date

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



HARD RED SPRING WHEAT

Spring wheat varieties are compared in trial plots at Waseca, Lamberton, Morris, Crookston, Stephen, Roseau, and St. Paul. Wheat varieties are grown in replicated plots at each location, and plots are handled so that the factors affecting

yield and other characteristics are as nearly the same for all varieties at each location as possible. These hard red spring wheat trials are not designed for crop (species) comparisons, because the various crops are grown on different fields or with different management. The data should only be used to compare varieties within a table.

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, 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. Use of more than one variety to provide different days to head-

Characteristics of hard red spring wheat varieties.

| Variety | Heading Date ¹ | Height, Inches ¹ | Straw Strength ² | Test Weight, Lb/Bushel ¹ | % Protein at 12% Moisture | Baking Quality ³ |
|-----------|---------------------------|-----------------------------|-----------------------------|-------------------------------------|---------------------------|-----------------------------|
| BacUp | 6-16 | 35 | Medium | 62.3 | 16.8 | High |
| Forge | 6-16 | 34 | M. Strong | 61.7 | 14.2 | Medium |
| Ingot | 6-16 | 37 | M. Strong | 62.6 | 15.0 | Medium-high |
| Oxen | 6-17 | 32 | M. Strong | 60.0 | 14.8 | High |
| 2375 | 6-18 | 34 | Medium | 60.8 | 14.2 | Medium |
| Alsen | 6-18 | 34 | Strong ¹ | 62.0 | 15.2 | - |
| Argent | 6-18 | 36 | Strong | 60.7 | 15.0 | High-medium |
| Dandy | 6-18 | 34 | V. Strong ¹ | 60.7 | 14.8 | - |
| Ember | 6-18 | 34 | M. Strong ² | 62.0 | 13.7 | Low-medium |
| McKenzie | 6-18 | 38 | Medium ¹ | 61.1 | 15.3 | - |
| Parshall | 6-18 | 38 | Strong | 62.3 | 15.2 | Medium-high |
| Russ | 6-18 | 36 | Medium | 60.4 | 14.3 | High-medium |
| Mercury | 6-18 | 30 | Strong | 60.5 | 14.3 | Medium |
| Reader | 6-18 | 35 | Strong ² | 61.0 | 14.9 | Medium |
| HJ98 | 6-19 | 33 | Medium | 59.4 | 14.1 | Medium-low |
| Norma | 6-20 | 33 | Strong | 60.5 | 13.9 | Medium-high |
| NorPro | 6-20 | 33 | V. Strong ² | 59.6 | 14.4 | Medium-low |
| AC Barrie | 6-20 | 38 | Medium | 60.4 | 15.1 | High-medium |
| Aurora | 6-20 | 29 | M. Strong ¹ | 58.6 | 13.6 | Low-medium |
| Verde | 6-20 | 33 | M. Strong | 60.4 | 14.1 | Low-medium |
| Ivan | 6-21 | 32 | V. Strong | 59.8 | 13.7 | Low |
| McVey | 6-21 | 35 | Medium | 58.2 | 13.2 | Low-medium |
| Marshall | 6-21 | 32 | V. Strong | 59.5 | 13.8 | Low-medium |
| Gummer | 6-22 | 37 | M. Strong | 60.8 | 15.5 | High-medium |
| Neara | 6-19 | 34 | | 60.6 | 14.7 | |
| LSD | 1 | 1 | | 1.1 | 0.4 | |

¹2000 data. ²1999-2000 data, except where indicated. ³1998-1999 data.

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

| Variety | Crookston 2000 | Crookston 1999-2000 | Roseau 2000 | Roseau 1998-2000 | Stephen 2000 | Stephen 1998-2000 |
|---------------|-------------------|------------------------|----------------|---------------------|-----------------|----------------------|
| BacUp | 68 | 77 | 71 | 78 | 55 | 71 |
| Forge | 107 | 107 | 74 | 87 | 96 | 89 |
| Ingot | 99 | 100 | 86 | 93 | 99 | 99 |
| Oxen | 104 | 106 | 106 | 111 | 107 | 107 |
| 2375 | 99 | 103 | 110 | 113 | 99 | 108 |
| Alsen | 88 | — | 100 | — | 97 | — |
| Argent | 97 | 96 | 87 | 85 | 90 | 90 |
| Dandy | 108 | — | 118 | — | 97 | — |
| Ember | 112 | — | 84 | — | 109 | — |
| McKenzie | 94 | — | 84 | — | 96 | — |
| Parshall | 100 | 103 | 97 | 100 | 102 | 96 |
| Russ | 92 | 96 | 117 | 96 | 117 | 109 |
| Mercury | 112 | 110 | 115 | 109 | 105 | 105 |
| Reeder | 103 | — | 109 | — | 100 | — |
| HJ98 | 96 | 101 | 113 | 112 | 124 | 121 |
| Norm | 102 | 102 | 100 | 105 | 93 | 96 |
| NorPro | 108 | — | 109 | — | 108 | — |
| AC Barrie | 95 | 88 | 80 | 78 | 89 | 81 |
| Aurora | 100 | — | 97 | — | 108 | — |
| Verde | 103 | 102 | 105 | 111 | 100 | 105 |
| Ivan | 107 | 113 | 119 | 118 | 95 | 106 |
| McVey | 102 | 101 | 107 | 112 | 119 | 118 |
| Marshall | 99 | 99 | 110 | 102 | 101 | 90 |
| Gunner | 78 | 74 | 88 | 90 | 105 | 104 |
| LSD | 9 | 14 | 14 | 21 | 11 | 16 |
| Mean, Bu/Acre | 69.1 | 57.8 | 59.5 | 52.9 | 47.4 | 48.2 |

ing 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

McVey – Awned, late maturity, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Moderately susceptible 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)**

Parshall – Awned, early-midseason maturity, tall. Resistant to stem rust and moderately resistant to leaf rust. Moderately resistant to other leaf diseases. High to medium yield and very high test weight. Strong straw. High protein per-

cent. Released by N.D. AES in 1999. **PVP (pending)**

HJ98 – Awned, midseason maturity, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Moderately susceptible to other leaf diseases. Very high yield and medium test weight.

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

| Variety | State 2000 | State 1998-2000 | North 2000 | North 1998-2000 | South 2000 | South 1998-2000 | On-Farm ¹ | |
|---------|---------------|--------------------|---------------|--------------------|---------------|--------------------|----------------------|-----------|
| | | | | | | | 2000 | 1998-2000 |
| BacUp | 67 | 73 | 65 | 75 | 69 | 72 | — | — |
| Forge | 96 | 95 | 93 | 94 | 98 | 96 | 96 | 101 |
| Ingot | 98 | 103 | 94 | 96 | 101 | 108 | 99 | 105 |
| Oxen | 110 | 113 | 105 | 110 | 114 | 115 | 102 | 113 |
| 2375 | 101 | 103 | 103 | 109 | 99 | 98 | 98 | 104 |
| Alsen | 103 | — | 94 | — | 110 | — | 92 | — |
| Argent | 94 | 96 | 92 | 90 | 96 | 99 | 89 | — |
| Dandy | 108 | — | 108 | — | 108 | — | 102 | — |
| Ember | 97 | — | 102 | — | 93 | — | 100 | — |

Medium straw strength. Medium to low protein percent. Released by Minn. AES and USDA-ARS in 1998. **PVP (94)**

Ingot – Awned, very 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 moderately resistant 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. Moderately strong straw. Medium to low protein percent. Released by S.D. AES in 1997. **PVP (94)**

Mercury – Awned, early-midseason 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 protein percent. Released by NorthStar Genetics in 1997.

Gunner – Awned, late maturity, tall. Resistant to stem rust and moderately sus-

| Variety | State | State | North | North | South | South | On-Farm ¹ | |
|------------|-------|-----------|-------|-----------|-------|-----------|----------------------|-----------|
| | 2000 | 1998-2000 | 2000 | 1998-2000 | 2000 | 1998-2000 | 2000 | 1998-2000 |
| McKenzie | 94 | — | 91 | — | 96 | — | 88 | — |
| Parshall | 98 | 100 | 100 | 100 | 97 | 100 | 93 | — |
| Russ | 108 | 107 | 107 | 99 | 109 | 112 | 98 | 111 |
| Mercury | 112 | 113 | 111 | 109 | 112 | 115 | 109 | — |
| Reeder | 106 | — | 104 | — | 108 | — | 103 | — |
| HJ98 | 106 | 106 | 109 | 110 | 103 | 104 | 111 | 109 |
| Norm | 99 | 104 | 99 | 103 | 99 | 105 | — | — |
| NorPro | 107 | — | 109 | — | 106 | — | 110 | — |
| AC Barrie | 81 | 79 | 88 | 81 | 76 | 78 | 84 | 81 |
| Aurora | 102 | — | 101 | — | 103 | — | — | — |
| Verde | 106 | 110 | 102 | 107 | 109 | 112 | 103 | 108 |
| Ivan | 106 | 113 | 108 | 114 | 105 | 112 | 110 | — |
| McVey | 102 | 105 | 108 | 110 | 97 | 101 | 111 | — |
| Marshall | 95 | 86 | 103 | 98 | 89 | 79 | 102 | 96 |
| Gunner | 82 | 86 | 89 | 87 | 76 | 86 | 89 | 90 |
| LSD | 10 | 7 | 13 | 11 | 14 | 9 | — | — |
| Mean, Bu/A | 57.4 | 51.7 | 58.7 | 52.5 | 56.5 | 51.2 | 72.4 | 61.5 |

¹On-farm tests were conducted at locations in eight northwestern Minnesota counties in 2000.

ceptible to leaf rust. Moderately resistant to other leaf diseases. Low yield and medium test weight. Moderately strong straw. High protein percent. Released by AgriPro in 1996. **PVP (94)**

Oxen – Awned, early, semidwarf. 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. **PVP (94)**

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

Verde – 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. Moderately strong straw. Medium to low protein percent. Released by Minn. AES and USDA-ARS in 1995. **PVP (94)**

AC Barrie – Awnless, midseason-late maturity, tall. Resistant to stem rust and moderately susceptible to leaf rust. Moderately susceptible to other leaf diseases.

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

| Variety | Lamberton | Lamberton | Morris | Morris | St. Paul | St. Paul | Waseca | Waseca |
|------------|-----------|-----------|--------|-----------|----------|-----------|--------|-----------|
| | 2000 | 1998-2000 | 2000 | 1998-2000 | 2000 | 1999-2000 | 2000 | 1998-2000 |
| BacUp | 74 | 74 | 67 | 75 | 59 | 60 | 82 | 72 |
| Forge | 101 | 96 | 93 | 94 | 96 | 88 | 112 | 105 |
| Ingot | 107 | 107 | 106 | 114 | 79 | 88 | 110 | 112 |
| Oxen | 120 | 116 | 107 | 115 | 118 | 120 | 118 | 112 |
| 2375 | 95 | 94 | 103 | 101 | 92 | 96 | 104 | 100 |
| Alsen | 123 | — | 104 | — | 99 | — | 123 | — |
| Argent | 104 | 105 | 95 | 100 | 98 | 94 | 85 | 93 |
| Dandy | 112 | — | 110 | — | 105 | — | 96 | — |
| Ember | 85 | — | 92 | — | 99 | — | 102 | — |
| McKenzie | 98 | — | 99 | — | 84 | — | 110 | — |
| Parshall | 100 | 104 | 97 | 101 | 93 | 95 | 98 | 97 |
| Russ | 112 | 107 | 114 | 113 | 103 | 110 | 102 | 119 |
| Mercury | 93 | 107 | 110 | 112 | 125 | 126 | 138 | 125 |
| Reeder | 116 | — | 103 | — | 113 | — | 99 | — |
| HJ98 | 100 | 98 | 111 | 107 | 106 | 108 | 81 | 103 |
| Norm | 97 | 108 | 104 | 104 | 98 | 103 | 93 | 106 |
| NorPro | 128 | — | 100 | — | 102 | — | 85 | — |
| AC Barrie | 71 | 77 | 79 | 82 | 83 | 83 | 62 | 72 |
| Aurora | 87 | — | 114 | — | 115 | — | 83 | — |
| Verde | 105 | 115 | 105 | 105 | 117 | 121 | 120 | 114 |
| Ivan | 119 | 114 | 94 | 109 | 114 | 121 | 94 | 108 |
| McVey | 84 | 94 | 114 | 106 | 79 | 94 | 102 | 109 |
| Marshall | 88 | 83 | 91 | 76 | 111 | 107 | 50 | 59 |
| Gunner | 75 | 86 | 91 | 89 | 70 | 81 | 43 | 81 |
| LSD | 13 | 15 | 10 | 17 | 12 | 22 | 16 | 21 |
| Mean, Bu/A | 57.7 | 50.1 | 87.3 | 68.1 | 50.8 | 42 | 30 | 41.5 |

Low yield and medium test weight. Medium straw strength. High to medium protein percent. Released by Agriculture and Agri-Food Canada Swift Current Research Station in 1994.

Norm – Awned, midseason-late, semi-dwarf. 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. **PVP**

2375 – Awned, early-midseason maturity, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Susceptible to other leaf diseases. High to medium yield and 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. **PVP (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. Very strong straw. Low to medium protein percent. Released by Minn. AES and USDA-ARS in 1982. **PVP**

Special-Purpose Varieties

Argent – Hard white spring wheat, awned, early-midseason maturity, medium height. Resistant to stem rust and moderately resistant to leaf rust. Moderately susceptible to other leaf diseases. Medium to high yield and high to medium test weight. Strong straw. Medium to high protein percent. Released by N.D. AES in 1998. **PVP (pending)**

BacUp – Awned, very 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 percent of acreage. Released by Minn. AES and USDA-ARS in 1996.

Varieties Not Adequately Tested

Alsen – Awned, early-midseason maturity, medium height. Resistant to stem rust and to leaf rust. High yield and very high test weight. Strong straw. High protein percent. Released by N.D. AES in 2000. **PVP (pending)**

Aurora – Awned, midseason-late maturity, semi-dwarf. Resistant to stem rust and moderately resistant to leaf rust. High to medium yield and low to medium test weight. Moderately strong straw. Low to medium protein percent. Released by NorthStar Genetics in 1999. **PVP (pending)**

Dandy – Awned, early-midseason maturity, medium height. Resistant to stem rust and moderately susceptible to leaf rust. Very high yield and high to medium test weight. Very strong straw. Medium protein percent. Released by NorthStar Genetics in 1999. **PVP (pending)**

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

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

Disease susceptibility and tolerances of hard red spring wheat varieties.

| Variety | Leaf Rust ¹ | Stem Rust ¹ | Other | | Grain Soundness ² |
|-----------------------|------------------------|------------------------|----------------------------|-------------------------------|------------------------------|
| | | | Leaf Diseases ¹ | Disease Severity ¹ | |
| BacUp | MS | R | S | MR | 1.5 |
| Forge | MS | R | MS | MR-MS | 2.5 |
| Ingot | MS | R | MS | MR-MS | 2.0 |
| Oxen | MR | R | MS | MS | 3.0 |
| 2375 | MS | R | S | MR-MS | 2.5 |
| Alsen ³ | R | R | – | MR | 1.5 |
| Argent | MR-MS | R | MS | MS-MR | 3.5 |
| Dandy ³ | MS | R | – | MS | 3.0 |
| Ember ⁴ | MS | R | MS | MR | 2.5 |
| McKenzie ³ | R | R | – | MS | 2.5 |
| Parshall | MR-MS | R | MR-R | MR-MS | 2.0 |
| Russ | MR | R | MS | MS | 3.0 |
| Mercury | MR | R | MR | S | 5.0 |
| Reeder ⁴ | MR-MS | R | MR-R | MS | 3.5 |
| HJ98 | MR | R | MS | MS | 3.0 |
| Norm | R | R | MR-R | S | 5.0 |
| NorPro ⁴ | MR | R | MR-R | MS-S | 3.5 |
| AC Barrie | MS | R | MS | MS-MR | 2.5 |
| Aurora ⁴ | MR-MS | R | – | S | 5.0 |
| Verde | MR-MS | R | MR-R | MS | 3.5 |
| Ivan | MR | R | MR-R | S-MS | 4.0 |
| McVey | MS | R | MS | MR | 2.5 |
| Marshall | MS | R | MS | MS | 3.5 |
| Gunner | 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 ³ 2000 data only. ⁴ 1999-2000 data only.

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

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

hard red spring wheat planting rate

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:

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

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 |

General-Purpose Varieties

Ransom – Awned, medium height, medium maturity and fair lodging resistance. Moderately high winterhardiness. Resistant to stem rust, moderately resistant to leaf rust. Medium test weight and protein. Released by North Dakota Agricultural Experiment Station 1998.

PVP (pending)

Crimson – Awned, red-chaffed, medium height, early-medium maturity, very good lodging resistance. Moderate winterhardiness. 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 1997. **PVP** (pending)

Tandem – Awned, medium height, early, fair lodging resistance. Moderate winterhardiness. Resistant to stem rust and susceptible to leaf rust. High test weight and protein. Released by S.D. AES 1997. **PVP** (pending)

Windstar – Awned, semidwarf, early, good lodging resistance. Moderate winterhardiness. Moderately resistant to stem rust and moderate resistance to leaf rust. Medium test weight, low-medium protein. Released by Neb. AES and USDA-ARS 1996. **PVP** (94)

Elkhorn – Awned, tall, medium maturity, fair lodging resistance. High winter-

hardiness. Resistant to stem rust, moderately susceptible to leaf rust. Medium test weight, high protein. Released by the N.D. AES 1995. **PVP**

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

Seward – Awned, tall, medium-late and good lodging resistance. Moderately high winterhardiness. Resistant to stem rust and susceptible to leaf rust. Low test weight and protein. Released by N.D. AES 1987

Roughrider – Awned, tall, medium maturity, fair lodging resistance. Very high winterhardiness. Resistant to stem rust but susceptible to leaf rust. High test weight and protein. Released by N.D. AES 1975.

Varieties Not Adequately Tested

Millennium – Awned, medium height, early, good lodging resistance, medium test weight and protein. Released by Neb. AES and USDA-ARS 1999. **PVP** (pending)

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 in the tables and year of release within variety categories. 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.

Nuplains – Awned, short-semidwarf, early-medium maturity, good lodging resistance. High test weight, medium protein, white grain color. Released by USDA-ARS and the Nebraska, South Dakota, and Wyoming Agricultural Experiment Stations 1999. **PVP** (pending)

Culver – Awned, medium height, early and fair lodging resistance. Medium test

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

Harding – Awned, medium height, early-medium maturity, fair lodging resistance, medium test weight, high protein. Released by S.D. AES 1997. **PVP** (pending)

Hard Red Winter Wheat Planting Rate and Date

| | |
|-----------------------------|--------------------|
| Bushel Weight (Pounds)..... | 60 |
| Seeds/Pound..... | 14,500 |
| Pounds Rate/Acre..... | 75+ |
| Seeds / Square Foot..... | 25 |
| Planting Date..... | Aug. 20 - Sept. 20 |

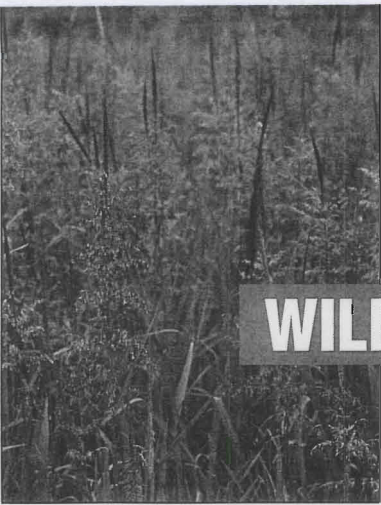
Growth characteristics of winter wheat varieties.

| Variety | Heading Date ¹ | Height, Centimeters ¹ | Winter-Hardiness ² | Lodging ³ | Test Weight Lb/Acre ¹ | Protein at 12% Moisture | Rust Resistance ⁴ | |
|------------|---------------------------|----------------------------------|-------------------------------|----------------------|----------------------------------|-------------------------|------------------------------|------|
| | | | | | | | Leaf | Stem |
| Arapahoe | 6/3 | 98 | M | 3.4 | 60.0 | 13.5 | MR | R |
| Culver | 6/3 | 95 | – | 3.6 | 60.0 | 13.4 | – | – |
| Tandem | 6/3 | 100 | M | 4.1 | 61.1 | 13.7 | S | R |
| Millennium | 6/4 | 101 | – | 2.3 ¹ | 60.5 | 13.5 | – | – |
| Windstar | 6/4 | 99 | M | 2.6 | 60.2 | 13.2 | MR-MS | MR |
| Crimson | 6/6 | 105 | M | 2.6 | 62.2 | 13.8 | S | MR |
| Harding | 6/6 | 106 | – | 5.3 | 60.8 | 13.8 | – | – |
| Nuplains | 6/6 | 89 | – | 2.3 ¹ | 61.4 | 13.3 | – | – |
| Elkhorn | 6/7 | 115 | H | 4.6 | 60.7 | 13.8 | MS | R |
| Roughrider | 6/7 | 114 | VH | 5.2 | 60.5 | 13.6 | S | R |
| Ransom | 6/8 | 104 | MH | 4.8 | 60.4 | 13.6 | MR | R |
| Seward | 6/8 | 113 | MH | 4.7 | 59.9 | 12.7 | S | R |
| Mean | 6/5 | 104 | | 4.3 | 60.7 | 13.5 | | |
| LSD | 2.1 | 8 | | 2 | 0.9 | 0.5 | | |

¹ 2000 data. ² 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, –=insufficient data. ³ 1=erect, 9=flat, 1998-2000 data. ⁴ R=resistant, MR=moderately resistant, MS=moderately susceptible, S=susceptible, –=insufficient data.

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

| Variety | Morris 2000 | Morris 1998, 2000 | Roseau 2000 | Roseau 1999-2000 | Rosemount 2000 | Rosemount 1998-2000 | Slate 2000 | Slate 1998-2000 |
|---------------|-------------|-------------------|-------------|------------------|----------------|---------------------|------------|-----------------|
| Arapahoe | 107 | 85 | 104 | 110 | 101 | 100 | 104 | 98 |
| Culver | 99 | 92 | 92 | 91 | 110 | 128 | 101 | 104 |
| Tandem | 102 | 104 | 98 | 104 | 103 | 107 | 101 | 105 |
| Millennium | 112 | – | 83 | – | 126 | – | 107 | – |
| Windstar | 111 | 119 | 96 | 101 | 114 | 119 | 107 | 115 |
| Crimson | 93 | 98 | 101 | 94 | 89 | 99 | 94 | 98 |
| Harding | 112 | 119 | 109 | 102 | 102 | 102 | 108 | 108 |
| Nuplains | 104 | – | 69 | – | 128 | – | 101 | – |
| Elkhorn | 90 | 96 | 98 | 96 | 81 | 87 | 89 | 92 |
| Roughrider | 94 | 92 | 97 | 93 | 76 | 79 | 89 | 87 |
| Ransom | 107 | 108 | 107 | 100 | 103 | 116 | 106 | 110 |
| Seward | 94 | 97 | 122 | 108 | 91 | 100 | 102 | 101 |
| LSD | 16 | 28 | 21 | 21 | 18 | 35 | 24 | 13 |
| Mean, Bu/Acre | 59.4 | 60 | 55.2 | 49 | 58.4 | 58 | 57.7 | 56 |



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 maturity, flowering 1 to 2 days after K2 and Petrowske Bottlebrush. Released 2000 by Minn. AES under an exclusive licensing agreement with the Minnesota Cultivated Wild Rice Council. **PVP** (pending)

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

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 |

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

Yield, shattering, lodging and fungal brown spot rating for wildrice varieties.

| Variety | Waskish | | | | Clearbrook | | | Altkin | | | 98-00 Average | | | |
|-----------------------|----------|------------|---------|----------|------------|---------|---------|--------|---------|-------|--------------------|-------------------------|----------------------|------------------|
| | Yield | Shattering | Lodging | FBS | Yield | Lodging | FBS | Yield | Lodging | FBS | Yield ¹ | Shattering ² | Lodging ³ | FBS ⁴ |
| Franklin | 1,361 | 19% | 2.4 | 4.9 | 1,870 | 3.5 | 3.9 | 1,401 | 2.2 | 4.9 | 1,471 | 19 | 2.5 | 4.6 |
| K2 | 1,452 | 15% | 1.6 | 4.5 | 1,801 | 3.0 | 4.5 | 1,337 | 1.7 | 4.1 | 1,499 | 15 | 2.0 | 4.4 |
| Petrowske Bottlebrush | 1,291 | 22% | 2.2 | 5.7 | 2,015 | 3.5 | 5.6 | 873 | 2.6 | 6.6 | 1,352 | 22 | 2.6 | 5.9 |
| Petrowske Purple | 1,524 | 11% | 1.2 | 3.5 | 1,974 | 2.5 | 3.5 | 1,316 | 1.2 | 3.4 | 1,572 | 11 | 1.5 | 3.5 |
| Voyager | 1,173 | 24% | 2.2 | 5.6 | 1,248 | 3.5 | 4.6 | 817 | 2.0 | 6.6 | 1,117 | 24 | 2.5 | 5.4 |
| LSD 5% | 258 | 4 | 0.6 | 0.8 | 613 | 0.9 | 0.9 | 435 | 0.5 | 1.0 | 213 | 4 | 0.4 | 0.7 |
| Years | 98-99-00 | 98-99 | 98-99 | 98-99-00 | 00 | 98 | 98 & 00 | 00 | 99-00 | 99-00 | | | | |

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 Using a 1-9 scale where 1=no significant disease lesions and 9=completely susceptible (dead).

OILSEED CROPS



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 has increased from about 8,000 acres in 1990 to more than 200,000 acres in 1998. Minnesota acreage for 2000 was close to 150,000 acres.

The oil in canola seed contains less than 2 percent erucic acid. This compares with the 20- to 40-percent level of erucic acid found in oilseed rape. The meal remaining after oil extraction contains less than 0.1 percent glucosinolate (sulfur-containing compounds) compared with about 1 percent in rapeseed meal. High levels of erucic acid in food oils are haz-

ardous to health, and high levels of glucosinolates are detrimental in livestock feeds.

The canola varieties described here are all spring-sown *Brassica napus* types. Winter canola varieties have been evaluated by University of Minnesota researchers at locations throughout the state. In trials over 15 year/locations, fewer than 30 percent of the trials have overwintered successfully.

Information Sources

The Minnesota Canola Council is a good source of information on canola. The council can be contacted by mail at 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

The Red Lake Falls testing site (formerly called the Crookston site) was on the Monte Casavan farm. At Fosston, the testing site was on the Ellsworth Danielson farm. The Roseau site was on Magnusson Farms. The Grygla site was on the Todd Stanley farm. There was a Kennedy test site on the Rob and Tim Rynning farm this year, but it was hailed out just prior to harvest.

Local Support

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

Field Day Assistance

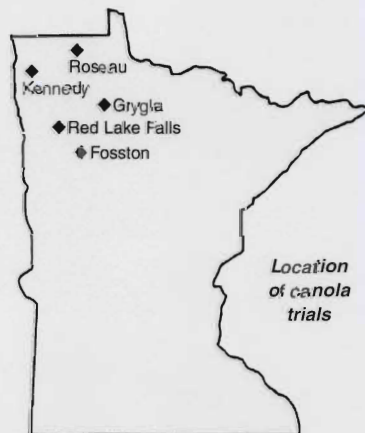
County extension educators Vincent W. Crary, Nathan L. Johnson, Herman J. Kendel, Gene Krause, Curtis W. Nyegaard, Joseph Shafer and Russ Severson provided field day assistance.

Canola Planting Rate and Date

| | |
|-------------------------------------|-------------------|
| Busbel 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 |

Canola Variety Name Changes

| Old Name or Experimental Number | New Variety Name |
|---------------------------------|------------------|
| PHS98-640 | InVigor 2573 |
| PHS98-639 | InVigor 2663 |
| 1-9175 | Biaca II |
| Proseed RR A104 | DS RoughRider |



Developers

- D1 Advanta Seeds, Dijkwelsestraat 70, Kapelle, Netherlands
D2 Agriprogress, P.O. Box 2499, Morden, Manitoba, Canada R6M 1C2
D3 Aventis Crop Science, 203-407 Downey Rd., Saskatoon, Saskatchewan, Canada S7N 4L8
D4 Cargill Ltd., P.O. Box 5900, 300-240 Graham Ave., Winnipeg, Manitoba, Canada
D5 Croplan Genetics, P.O. Box 1291, Minot, ND 58702
-
- D6 Danisco Seed, Mariba Seeds, Copenhagen, Denmark
D7 DLF-Trifolium, Store Heddinge, Denmark
D8 Dow AgroSciences, 104-111 Research Dr., Saskatoon, Saskatchewan, S7N 3R2
D9 InterMountain Canola Cargill, 2300 N. Yellowstone Hwy., Suite 122, Idaho Falls, ID 83401
D10 LiBred, Box 99, St. Norbert PO, Winnipeg, Manitoba, Canada R3V 1L5
-
- D11 Limagrain Canada Seeds Inc., #4-411 Downey Rd, Saskatoon, Saskatchewan, Canada S7N 4L8
D12 Pioneer Hi-Bred International, Inc., 7200 N.W. 62nd Ave., Johnston, Iowa 50131
D13 Svalöf Weibull Seed, P.O. Box 217, Lindsay, Ontario, Canada K9V 5Z4
D14 SWP, ARD, Saskatoon, Saskatchewan, Canada S7N 4L8
D15 University of Alberta, P.O. Box 2700, Station "M", Calgary, Alberta, Canada T2P 2P5
D16 Not available

Marketers

- M1 Agritel Grain, Box 808 Beausjour, Manitoba, Canada, R0E 0C0, Phone: 218-289-4045
M2 Aventis Crop Science, 203-407 Downey Rd., Saskatoon, Saskatchewan, Canada S7N 4L8, Phone: 306-477-9427
M3 Cargill Ltd., P.O. Box 5900, 300-240 Graham Ave., Winnipeg, Manitoba, Canada R3C 4C5, Phone: 204-947-6319
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, Phone: 208-522-4113
M7 Interstate Seed Company, 1215 Parkway, West Fargo, ND 58078, Phone: 800-437-4120
M8 Kaystar Seed, P.O. Box 947, Huron, SD 57350, Phone: 605-352-8791
M9 Legend Seeds, Box 241, De Smet, SD 57321, Phone: 800-678-3346
M10 Monsanto, 3100 Sycamore Rd., De Kalb, IL 60115, Phone: 815-758-9323
-
- M11 Mycogen Seeds, 9330 Zionsville Rd., Bldg. 308-3E, Indianapolis, IN 46268, Phone: 800-667-3852
M12 Performance Seeds Canada Ltd., 422 McDonald St., Regina, Saskatchewan, Canada S4N 6E1, Phone: 306 791-0920
M13 Pioneer Hi-Bred International, Inc., 130 S.E. Willmar Ave., Willmar, MN. 56201, Phone: 701-298-6894
M14 Promark, 389 Park Ave. E., Brandon, Manitoba, Canada R7A 7A5, Phone: 204-727-3337
M15 Proseed, 705 E. Brewster, Harvey, ND, 58341, Phone: 701-324-4177
-
- M16 Seeds 2000, Box 200 Breckenridge, MN 56520, Phone: 218-643-2410
M17 Vandaele Seeds, Box 144, Medora, Manitoba, Canada R0M 1K0, Phone: 204-665-2384
M18 Not Available

Seed yield of canola (*Brassica napus*) varieties, lb/acre at 8% moisture, at Fosston, Grygla, Red Lake Falls and Roseau in 2000.

Variety information includes Source Codes: (D# = Developer; M# = Marketer) keyed to listing, page 59, and these supplemental codes: H=Hybrid, SP=Specialty oil, Op=Open Pollinated, Syn=Synthetic, LL=Liberty Link, C=Clearfield (Raptor tolerant). **Note:** The Red Lake Falls location was formerly called Crookston. Grygla was a new location in 2000. ***Note:** Minot is a Roundup Ready variety.

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

| Variety | Variety Information | Blackleg Resistance | Roseau | Red Lake Falls | Average, | | Fosston | Grygla | Average, All Sites |
|------------------|---------------------|---------------------|--------|----------------|----------|----------------|---------|--------|--------------------|
| | | | | | Roseau, | Red Lake Falls | | | |
| 45A03 | D12,M13, Op | R | 1,779 | 2,511 | 2,145 | | 1,453 | 1,764 | 1,877 |
| 46A65 | D12,M13, Op | R | 1,919 | 2,305 | 2,112 | | 1,770 | 1,791 | 1,946 |
| 46A76 | D12,M13, Op,C | R | 1,900 | 2,301 | 2,101 | | 2,002 | 1,865 | 2,017 |
| 601 | D5,M4,H | MR | 2,053 | 2,083 | 2,068 | | 1,958 | 2,012 | 2,014 |
| A99-2N | D15,M18,Op, | R | 1,825 | - | - | | - | - | - |
| Bianca II | D6,M12,Op | R | 1,775 | - | - | | - | - | - |
| C5027 | D13,M5,H,Syn | MR | 1,888 | - | - | | - | - | - |
| Cheetah | D5,M4,Op,Sp | MS | 1,438 | 1,484 | 1,461 | | - | - | - |
| CL2070 | D5,M4,H | MR | 1,927 | - | - | | - | - | - |
| CL2078 | D5,M4,Syn | MR | 1,862 | 2,213 | 2,038 | | 1,831 | 1,652 | 1,890 |
| CrackerJack | D13,M5,H,Syn | MR | 1,909 | - | - | | - | 1,729 | - |
| DAS EXP 203 | D8,M18,Op,Sp | R | 1,771 | - | - | | - | - | - |
| DAS EXP 204 | D8,M18,Op,Sp | R | 1,729 | - | - | | - | - | - |
| Eagle | D13,M5,Op | MR | 1,557 | - | - | | - | - | - |
| Ebony | D11,M1,Op | MR | 1,832 | 2,328 | 2,080 | | 1,895 | 1,906 | 1,990 |
| Golden Boy | D13,M16, Syn | MR | 1,874 | 2,253 | 2,064 | | 1,756 | 1,646 | 1,882 |
| Goliath | D5,M4,Op | MR | 1,699 | 2,151 | 1,925 | | 1,464 | 1,701 | 1,754 |
| Hudson | D5,M4,Op | MR | 1,817 | 2,226 | 2,022 | | 1,511 | 1,456 | 1,753 |
| Hyola 330 | D1,M7,H | MS | 2,109 | 2,587 | 2,348 | | - | - | - |
| Hyola 401 | D1,M7,H | S | 1,776 | 2,398 | 2,087 | | - | - | - |
| Hyola 420 | D1,M7,H | MR | 1,920 | 2,376 | 2,148 | | - | - | - |
| Hyper 5001 | D13,M5,H | R | 1,838 | - | - | | - | 1,479 | - |
| IMC 201 | D9,M6,Op,Sp | MS | 1,612 | 2,074 | 1,843 | | - | - | - |
| IMC 202 | D9,M6,Op,Sp | MS | 1,539 | 2,022 | 1,780 | | - | - | - |
| IMC 204 | D9,M6,Op,Sp | MS | 1,930 | 1,925 | 1,927 | | - | - | - |
| IMC 205 | D9,M6,Op,Sp | MS | 1,552 | 2,263 | 1,908 | | - | - | - |
| IMC 302 | D9,M6,Op,Sp | MS | 1,532 | 1,949 | 1,741 | | - | - | - |
| IMC 303 | D9,M6,Op,Sp | MS | 1,208 | 1,532 | 1,370 | | - | - | - |
| InVigor 2573 | D3,M2,H,LL | R | 2,105 | - | - | | 1,988 | 1,803 | - |
| InVigor 2663 | D3,M2,H,LL | R | 2,123 | - | - | | 2,128 | 1,942 | - |
| KC-007 | D16,M8,Op | MS | - | 2,484 | - | | - | - | - |
| KC-701 | D16,M8,H | MR | 1,712 | 2,120 | 1,916 | | - | - | - |
| LG3311 | D11,M1,Op | R | 1,757 | 2,127 | 1,942 | | 1,737 | 1,644 | 1,816 |
| LG3366 | D11,M1,Op | R | 1,795 | 2,251 | 2,023 | | 1,678 | 1,906 | 1,907 |
| LiBred 280 | D10,M17,Op | MS | 1,947 | - | - | | - | - | - |
| LiBred 96-2393LL | D10,M18,Op,LL | MR | 2,062 | - | - | | - | - | - |
| LiBred Agassiz | D10,M17,Op | MR | 1,905 | - | - | | - | - | - |
| Lynx | D5,M4,Op,Sp | MS | 1,455 | - | - | | - | - | - |
| Minot* | D5,M4, Op | MR | 1,586 | 2,054 | 1,820 | | 1,647 | 1,754 | 1,760 |
| N098-0272 | D14,M18,Op, C | MR | 1,777 | 2,079 | 1,928 | | 1,736 | 1,909 | 1,875 |
| N098-0439 | D14,M18,Op, C | MR | 1,810 | 2,226 | 2,018 | | 1,708 | 1,732 | 1,869 |
| Nex 500 | D8,M11,Op | MR | 1,884 | - | - | | - | - | - |
| Nex 705 | D8,M18,Op,Sp | MS | 1,662 | - | - | | - | - | - |
| Nex 710 | D8,M18,Op,Sp | MS | 1,687 | - | - | | - | - | - |
| NL98-3706 | D14,M18,Op | MR | 1,792 | 2,210 | 2,001 | | 1,600 | 1,526 | 1,801 |
| NL98-4413 | D14,M18,Op | MR | 1,766 | 1,762 | 1,764 | | 1,379 | 1,589 | 1,624 |
| NS3213 | D12,M13, Op, C | R | 1,825 | - | - | | - | - | - |

| Variety | Variety Information | Blackleg Resistance | Roseau | Red Lake Falls | Average, | | Fosston | Grygla | Average, All Sites |
|--------------|---------------------|---------------------|--------|----------------|----------|----------------|---------|--------|--------------------|
| | | | | | Roseau, | Red Lake Falls | | | |
| NS3223 | D12,M13, Op, C | R | 1,856 | — | — | — | — | — | — |
| NS3233 | D12,M13, Op, C | R | 2,110 | — | — | — | — | — | — |
| NS3585 | D12,M13, H | R | 2,107 | — | — | — | — | — | — |
| Oscar | D5,M4,Op | MR | 1,611 | — | — | — | — | — | — |
| PHS99-763 | D3,M2,H,LL | MR | 2,060 | — | — | 1,928 | 2,111 | — | — |
| PHS99-764 | D3,M2,H,LL | MR | 2,153 | — | — | 2,089 | 2,110 | — | — |
| PHS99-836 | D3,M2,H,LL | R | 2,196 | — | — | 1,942 | 2,113 | — | — |
| PHS99-842 | D3,M2,H,LL | R | 2,305 | — | — | 1,927 | 1,862 | — | — |
| Promark 220 | D13,M15, Syn | MR | 1,845 | 2,176 | 2,011 | 1,735 | 1,668 | 1,856 | — |
| Proseed 1492 | D2,M15, H | MR | 1,771 | 2,347 | 2,059 | 1,997 | 1,887 | 2,009 | — |
| Q2 | D15,M7,Op | R | 1,742 | 2,263 | 2,003 | — | — | — | — |
| S8003 | D1,M7,Op, C | MR | 1,745 | 2,342 | 2,043 | — | — | — | — |
| S8013 | D1,M7,Op, C | MR | 1,477 | — | — | — | — | — | — |
| S8015 | D1,M7,Op, C | MR | 1,738 | — | — | — | — | — | — |
| Skyhawk | D7,M14, Op | R | 1,950 | 2,225 | 2,088 | 2,017 | 2,053 | 2,061 | — |
| SW B2691 | D13,M18, Syn | MR | 1,773 | 2,385 | 2,079 | — | — | — | — |
| SW C5026 | D13,M18, Syn | MR | 1,871 | 2,382 | 2,127 | — | — | — | — |
| SW C5048 | D13,M18, Syn | MR | 2,028 | 2,294 | 2,161 | — | — | — | — |
| SWLM C5011 | D13,M18, H | MR | 1,845 | 2,283 | 2,064 | — | — | — | — |
| SW-P98107 | D14,M18,H | MR | 1,886 | 2,258 | 2,072 | 1,720 | 1,681 | 1,886 | — |
| Mean | | | 1,823 | 2,191 | 1,981 | 1,792 | 1,796 | 1,879 | — |
| LSD (0.05) | | | 336.4 | 199.5 | 194.9 | 230.6 | 284.9 | 132.9 | — |
| C.V. | | | 13.2 | 6.5 | 10.0 | 9.1 | 11.3 | 10.1 | — |

Seed yield of canola (*Brassica napus*) varieties, lb/acre at 8% moisture, across years and locations.

Various combinations of the Roseau (R), Red Lake Falls (L), Fosston (F), Kennedy (K), and Grygla (G) yields across locations and years (1998-2000) for varieties grown in these various combinations are presented. **Note:** The Red Lake Falls location was formerly called Crookston. **Note:** Varieties in these trials include non-herbicide tolerant Liberty Link and Clearfield varieties. Long-term averages of Hyola 401 (1993-2000) and 46A65 (1996-2000) are 2,010 and 1,971 lb/acre, respectively.

| Variety | '98 - RLKF | '98 - RL | '98 - R | '98 - F |
|--------------|------------|----------|----------|---------|
| | '99 - RKF | '99 - RK | '99 - RK | '99 - R |
| | '00 - RLFG | '00 - RL | '00 - RL | '00 - R |
| 45A03 | — | — | 1,921 | — |
| 46A65 | 2,050 | 2,107 | 2,012 | 1,945 |
| 46A76 | — | — | 2,012 | — |
| 96-2393LL | — | — | — | — |
| CL2070 | — | — | — | 2,050 |
| CL2078 | 2,082 | 2,214 | 2,017 | 2,080 |
| CrackerJack | — | — | — | 2,160 |
| Eagle | — | — | — | 1,709 |
| Ebony | — | 2,205 | 1,978 | 2,000 |
| Golden Boy | — | — | 1,959 | 1,927 |
| Hudson | 1,849 | 1,927 | 1,907 | 1,741 |
| Hyola 330 | — | 2,238 | 2,149 | 2,019 |
| Hyola 401 | — | 2,153 | 2,026 | 1,991 |
| Hyola 420 | — | 2,136 | 2,055 | 1,911 |
| InVigor 2663 | — | — | — | — |
| KC-701 | — | — | 1,934 | 2,078 |
| Oscar | — | — | — | 1,812 |

Seed yield of canola (*Brassica napus*) varieties, lb/acre at 8% moisture, across years and locations (continued).

Various combinations of the Roseau (R), Red Lake Falls (L), Fosston (F), Kennedy (K), and Grygla (G) yields across locations and years (1998-2000) for varieties grown in these various combinations are presented. **Note:** The Red Lake Falls location was formerly called Crookston. **Note:** Varieties in these trials include non-herbicide tolerant Liberty Link and Clearfield varieties. Long term averages of Hyola 401 (1993-2000) and 46A65 (1996-2000) are 2,010 and 1,971 lb/acre, respectively.

| Variety | '98 - RLKF | '98 - RL | | '98 - R | | '98 - F |
|-------------|------------|----------|----------|---------|---------|---------|
| | '99 - RKF | '99 - RK | '99 - RK | '99 - R | '99 - R | '99 - F |
| | '00 - RLFG | '00 - RL | '00 - RL | '00 - R | '00 - R | '00 - F |
| Promark 220 | — | — | — | 2,015 | 1,772 | 1,996 |
| Proseed1492 | — | — | — | — | 1,841 | — |
| Q2 | — | 2,057 | 1,941 | 1,829 | 1,703 | — |
| SW B2691 | — | — | 1,995 | — | 1,766 | — |
| Mean | 1994 | 2,130 | 1,993 | 1,951 | 1,778 | 1,877 |

Growth characteristics and oil content of canola varieties grown near Roseau, seeded May 15, 2000.

| 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 |
|--------------|-------------------------------|--------------------------------------|------------------------|-----------------|--|----------------|-----------------------------|
| | | | 95% Canopy Closure | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | | |
| 45A03 | 1,779 | 50.7 | 32 | 46 | 85 | 37 | 1.8 |
| 46A65 | 1,919 | 51.2 | 32 | 46 | 85 | 46 | 2.0 |
| 46A76 | 1,900 | 51.3 | 32 | 47 | 86 | 43 | 1.0 |
| 601 | 2,053 | 46.6 | 32 | 48 | 89 | 47 | 1.8 |
| A99-2N | 1,825 | 52.1 | 30 | 47 | 88 | 48 | 2.0 |
| Bianca II | 1,775 | 53.6 | 32 | 45 | 87 | 41 | 1.5 |
| C5027 | 1,888 | 51.2 | 31 | 45 | 86 | 41 | 1.5 |
| Cheetah | 1,438 | 45.2 | 35 | 49 | 88 | 34 | 2.5 |
| CL2070 | 1,927 | 46.6 | 32 | 48 | 88 | 47 | 1.8 |
| CL2078 | 1,862 | 47.4 | 32 | 47 | 88 | 43 | 1.5 |
| Cracker Jack | 1,909 | 50.1 | 31 | 47 | 87 | 43 | 1.3 |
| DAS Exp 203 | 1,771 | 47.8 | 32 | 49 | 88 | 48 | 2.0 |
| DAS Exp 204 | 1,729 | 48.9 | 33 | 47 | 87 | 45 | 2.0 |
| Eagle | 1,557 | 48.1 | 33 | 45 | 85 | 36 | 2.0 |
| Ebony | 1,832 | 51.9 | 31 | 48 | 87 | 41 | 2.0 |
| Golden Boy | 1,874 | 48.3 | 33 | 46 | 88 | 41 | 1.8 |
| Goliath | 1,699 | 48.6 | 34 | 45 | 88 | 36 | 2.5 |
| Hudson | 1,817 | 48.6 | 33 | 45 | 85 | 39 | 1.8 |
| Hyola 330 | 2,109 | 49.7 | 30 | 44 | 83 | 37 | 2.3 |
| Hyola 401 | 1,776 | 49.8 | 30 | 45 | 85 | 39 | 2.0 |
| Hyola 420 | 1,920 | 50.6 | 31 | 45 | 86 | 39 | 2.3 |
| Hyper 5001 | 1,838 | 48.1 | 32 | 47 | 88 | 41 | 1.8 |
| IMC 201 | 1,612 | 49.3 | 32 | 46 | 87 | 39 | 2.3 |
| IMC 202 | 1,539 | 51.5 | 33 | 47 | 87 | 38 | 2.0 |
| IMC 204 | 1,930 | 52.0 | 31 | 45 | 86 | 41 | 2.5 |
| IMC 205 | 1,552 | 50.3 | 33 | 49 | 87 | 39 | 1.5 |
| IMC 302 | 1,532 | 45.8 | 34 | 49 | 89 | 44 | 1.3 |
| IMC 303 | 1,208 | 48.4 | 34 | 46 | 88 | 34 | 1.8 |
| InVigor 2573 | 2,105 | 50.2 | 30 | 48 | 87 | 48 | 2.0 |
| InVigor 2663 | 2,123 | 49.4 | 30 | 49 | 87 | 47 | 2.0 |
| KC-701 | 1,712 | 49.8 | 32 | 47 | 87 | 41 | 1.0 |
| LG3311 | 1,757 | 49.8 | 33 | 45 | 86 | 39 | 2.0 |
| LG3366 | 1,795 | 48.6 | 33 | 47 | 88 | 42 | 2.0 |

| Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Weight at 0% Moisture | 95% Canopy Closure | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | Height, Inches | Lodging, 1 = Erect 9 = Flat |
|------------------|-------------------------------------|--|-----------------------|--------------------|--|-------------------|-----------------------------------|
| LiBred 280 | 1,947 | 53.8 | 31 | 47 | 86 | 50 | 2.3 |
| LiBred 96-2393LL | 2,062 | 50.2 | 31 | 46 | 88 | 50 | 2.3 |
| LiBred Agassiz | 1,905 | 48.7 | 31 | 48 | 88 | 49 | 2.3 |
| Lynx | 1,455 | 46.4 | 34 | 48 | 89 | 37 | 3.0 |
| Minot* | 1,586 | 50.6 | 33 | 46 | 85 | 40 | 2.0 |
| N098-0272 | 1,777 | 49.5 | 31 | 50 | 88 | 40 | 1.0 |
| N098-0439 | 1,810 | 51.6 | 31 | 44 | 84 | 39 | 1.8 |
| NEX 500 | 1,884 | 50.9 | 32 | 48 | 87 | 43 | 1.8 |
| NEX 705 | 1,662 | 52.9 | 32 | 48 | 88 | 43 | 1.5 |
| NEX 710 | 1,687 | 53.1 | 33 | 45 | 87 | 37 | 2.3 |
| NL98-3706 | 1,792 | 50.8 | 32 | 48 | 86 | 43 | 2.0 |
| NL98-4413 | 1,766 | 47.2 | 32 | 46 | 86 | 41 | 2.3 |
| NS3213 | 1,825 | 52.0 | 31 | 46 | 87 | 43 | 2.0 |
| NS3223 | 1,856 | 48.5 | 32 | 49 | 87 | 43 | 2.3 |
| NS3233 | 2,110 | 51.5 | 31 | 45 | 86 | 42 | 1.3 |
| NS3585 | 2,107 | 50.9 | 31 | 46 | 86 | 45 | 1.5 |
| Oscar | 1,611 | 46.4 | 33 | 46 | 87 | 36 | 2.0 |
| PHS99-763 | 2,060 | 50.7 | 31 | 46 | 85 | 43 | 2.0 |
| PHS99-764 | 2,153 | 50.2 | 30 | 46 | 84 | 48 | 2.5 |
| PHS99-836 | 2,196 | 49.9 | 30 | 47 | 86 | 48 | 1.5 |
| PHS99-842 | 2,305 | 48.2 | 29 | 50 | 88 | 53 | 2.0 |
| Promark 220 | 1,845 | 49.8 | 33 | 46 | 87 | 38 | 1.3 |
| Proseed 1492 | 1,771 | 50.8 | 32 | 46 | 87 | 39 | 2.0 |
| Q2 | 1,742 | 48.6 | 33 | 47 | 88 | 43 | 1.8 |
| S8003 | 1,745 | 50.1 | 31 | 45 | 83 | 36 | 2.0 |
| S8013 | 1,477 | 49.5 | 32 | 51 | 88 | 41 | 2.5 |
| S8015 | 1,738 | 51.1 | 31 | 50 | 88 | 45 | 2.0 |
| Skyhawk | 1,950 | 50.4 | 32 | 45 | 86 | 41 | 1.8 |
| SW B2691 | 1,773 | 50.9 | 32 | 46 | 86 | 39 | 1.3 |
| SW C5026 | 1,871 | 50.3 | 32 | 46 | 86 | 39 | 1.5 |
| SW C5048 | 2,028 | 48.7 | 31 | 47 | 87 | 44 | 1.3 |
| SWLM C5011 | 1,845 | 50.8 | 33 | 46 | 87 | 37 | 1.8 |
| SW-P98107 | 1,886 | 48.8 | 32 | 47 | 86 | 42 | 1.8 |
| Mean | 1,823 | 49.8 | 32 | 47 | 87 | 42 | 1.9 |
| _SD (0.05) | 336.4 | 2.25 | 1.5 | 0.9 | 1.4 | 6.4 | 0.61 |
| C.V. | 13.2 | 3.2 | 3.5 | 1.3 | 1.2 | 11.0 | 23.5 |

* Minot is a Roundup Ready variety.

Growth characteristics and oil content of canola varieties grown near Red Lake Falls, seeded April 28, 2000.

| Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Weight at 0% Moisture | Days After Planting to | | Height, Inches |
|------------|-------------------------------------|--|------------------------|--|-------------------|
| | | | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | |
| 15A03 | 2,511 | 47.9 | 52 | 94 | 45 |
| 16A65 | 2,305 | 49.8 | 51 | 95 | 49 |
| 16A76 | 2,301 | 48.5 | 53 | 97 | 51 |
| 301 | 2,083 | 47.4 | 54 | 97 | 51 |
| Chetah | 1,484 | 47.0 | 53 | 97 | 43 |
| CL2078 | 2,213 | 47.3 | 52 | 97 | 50 |
| Ebony | 2,328 | 49.8 | 52 | 97 | 50 |
| Golden Boy | 2,253 | 47.8 | 52 | 96 | 53 |
| Joliath | 2,151 | 51.1 | 49 | 99 | 45 |

| Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Weight at 0% Moisture | Days After Planting to | | Height, Inches |
|--------------|-------------------------------------|--|------------------------|--|-------------------|
| | | | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | |
| Hudson | 2,226 | 49.0 | 50 | 94 | 44 |
| Hyola 330 | 2,587 | 49.2 | 48 | 94 | 39 |
| Hyola 401 | 2,398 | 47.5 | 49 | 96 | 40 |
| Hyola 420 | 2,376 | 48.7 | 50 | 96 | 45 |
| IMC 201 | 2,074 | 49.3 | 51 | 96 | 45 |
| IMC 202 | 2,022 | 49.3 | 52 | 96 | 43 |
| IMC 204 | 1,925 | 50.2 | 49 | 95 | 39 |
| IMC 205 | 2,263 | 49.0 | 54 | 96 | 46 |
| IMC 302 | 1,949 | 48.0 | 54 | 96 | 50 |
| IMC 303 | 1,532 | 47.6 | 54 | 98 | 41 |
| KC-007 | 2,484 | 49.1 | 54 | 95 | 54 |
| KC-701 | 2,120 | 47.7 | 53 | 97 | 51 |
| LG 3311 | 2,127 | 48.8 | 51 | 96 | 45 |
| LG 3366 | 2,251 | 47.8 | 53 | 97 | 49 |
| Minot* | 2,054 | 49.1 | 52 | 95 | 41 |
| N098-0272 | 2,079 | 46.7 | 54 | 98 | 49 |
| N098-0439 | 2,226 | 49.8 | 50 | 95 | 34 |
| NL98-3706 | 2,210 | 49.5 | 52 | 95 | 45 |
| NL98-4413 | 1,762 | 45.9 | 50 | 96 | 46 |
| Promark 220 | 2,176 | 47.3 | 52 | 96 | 49 |
| Proseed 1492 | 2,347 | 47.7 | 52 | 98 | 51 |
| Q2 | 2,263 | 48.4 | 54 | 97 | 49 |
| S8003 | 2,342 | 47.0 | 49 | 95 | 39 |
| Skyhawk | 2,225 | 47.8 | 50 | 96 | 52 |
| SW B2691 | 2,385 | 48.2 | 51 | 96 | 53 |
| SW C5026 | 2,382 | 47.8 | 52 | 97 | 50 |
| SW C5048 | 2,294 | 48.2 | 52 | 96 | 50 |
| SWLM C5011 | 2,283 | 49.1 | 52 | 96 | 51 |
| SW-P98107 | 2,258 | 47.4 | 51 | 95 | 50 |
| Mean | 2,191 | 48.4 | 52 | 96 | 47 |
| LSD (0.05) | 1,99.5 | 1.74 | 1.9 | 2.1 | 4.7 |
| C.V. | 6.5 | 2.6 | 2.6 | 1.6 | 7.2 |

Growth characteristics and oil content of canola varieties grown near Fosston, seeded May 10, 2000.

| 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 | | |
| 45A03 | 1,453 | 47.8 | 50 | 89 | 47 | 3.8 |
| 46A65 | 1,770 | 48.6 | 50 | 90 | 44 | 3.5 |
| 46A76 | 2,082 | 47.8 | 52 | 93 | 47 | 3.0 |
| 601 | 1,958 | 48.2 | 52 | 92 | 50 | 2.8 |
| CL2078 | 1,831 | 46.5 | 52 | 92 | 45 | 3.0 |
| Ebony | 1,895 | 48.6 | 52 | 92 | 47 | 3.3 |
| Golden Boy | 1,756 | 46.1 | 52 | 92 | 51 | 3.5 |
| Goliath | 1,464 | 49.1 | 49 | 92 | 42 | 4.8 |
| Hudson | 1,511 | 46.7 | 49 | 89 | 42 | 4.0 |
| InVigor 2573 | 1,988 | 47.3 | 52 | 91 | 52 | 4.0 |
| InVigor 2663 | 2,128 | 47.1 | 53 | 90 | 54 | 3.0 |
| LG3311 | 1,737 | 48.4 | 50 | 89 | 44 | 3.0 |

| 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 | | |
| LG3366 | 1,678 | 46.8 | 51 | 93 | 49 | 2.8 |
| Minot* | 1,647 | 47.8 | 51 | 90 | 41 | 4.8 |
| N098-0272 | 1,736 | 46.6 | 55 | 93 | 49 | 3.0 |
| N098-0439 | 1,708 | 48.1 | 48 | 88 | 44 | 4.0 |
| NL98-3706 | 1,600 | 47.8 | 51 | 91 | 44 | 5.0 |
| NL98-4413 | 1,379 | 42.4 | 50 | 91 | 45 | 4.8 |
| PHS99-763 | 1,928 | 46.8 | 49 | 90 | 49 | 3.8 |
| PHS99-764 | 2,089 | 47.7 | 48 | 88 | 44 | 3.8 |
| PHS99-836 | 1,942 | 46.7 | 50 | 90 | 48 | 4.5 |
| PHS99-842 | 1,927 | 46.3 | 53 | 92 | 53 | 4.3 |
| Promark 220 | 1,735 | 47.2 | 52 | 91 | 51 | 1.3 |
| Proseed 1492 | 1,997 | 48.3 | 51 | 91 | 48 | 3.3 |
| Skyhawk | 2,017 | 48.0 | 49 | 90 | 47 | 3.8 |
| SW-P98107 | 1,720 | 46.0 | 52 | 92 | 47 | 2.8 |
| Mean | 1,792 | 47.3 | 51 | 91 | 47 | 3.6 |
| LSD (0.05) | 230.6 | 1.18 | 0.9 | 1.5 | 4.1 | 1.24 |
| C.V. | 9.1 | 1.8 | 1.3 | 1.2 | 6.2 | 24.5 |

* Minot is a Roundup Ready variety.

Growth characteristics and oil content of canola varieties grown near Grygla, seeded May 9, 2000.

| 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 |
|--------------|-------------------------------------|--|------------------------|--------------------|--|-------------------|-----------------------------------|
| | | | 95% Canopy Closure | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | | |
| 45A03 | 1,764 | 45.0 | 33 | 49 | 89 | 53 | 1.8 |
| 46A65 | 1,791 | 46.8 | 35 | 48 | 90 | 60 | 3.3 |
| 46A76 | 1,865 | 43.4 | 34 | 50 | 92 | 61 | 2.0 |
| 601 | 2,012 | 43.8 | 32 | 50 | 91 | 59 | 1.5 |
| CL2078 | 1,652 | 42.0 | 33 | 49 | 91 | 56 | 1.5 |
| Cracker Jack | 1,729 | 43.5 | 33 | 50 | 91 | 57 | 1.8 |
| Ebony | 1,906 | 46.2 | 33 | 50 | 90 | 55 | 1.8 |
| Golden Boy | 1,646 | 42.6 | 34 | 50 | 91 | 60 | 1.8 |
| Goliath | 1,701 | 46.7 | 35 | 48 | 91 | 55 | 3.3 |
| Hudson | 1,456 | 44.1 | 35 | 46 | 86 | 50 | 1.8 |
| Hyper 5001 | 1,479 | 42.0 | 33 | 50 | 91 | 59 | 1.3 |
| InVigor 2573 | 1,803 | 42.9 | 33 | 50 | 90 | 60 | 2.8 |
| InVigor 2663 | 1,942 | 44.3 | 31 | 50 | 88 | 57 | 2.8 |
| LG3311 | 1,644 | 46.4 | 34 | 48 | 88 | 54 | 2.3 |
| LG3366 | 1,906 | 44.1 | 34 | 50 | 91 | 55 | 2.0 |
| Minot* | 1,754 | 45.8 | 35 | 49 | 89 | 53 | 2.8 |
| N098-0272 | 1,909 | 44.8 | 34 | 52 | 94 | 60 | 1.3 |
| N098-0439 | 1,732 | 46.5 | 34 | 46 | 86 | 49 | 2.5 |
| NL98-3706 | 1,526 | 46.5 | 34 | 50 | 90 | 52 | 2.8 |
| NL98-4413 | 1,589 | 42.5 | 34 | 48 | 91 | 56 | 3.5 |
| PHS99-763 | 2,111 | 45.8 | 33 | 48 | 90 | 52 | 3.3 |
| PHS99-764 | 2,110 | 46.7 | 31 | 47 | 87 | 49 | 3.0 |
| PHS99-836 | 2,113 | 45.3 | 32 | 49 | 89 | 55 | 2.0 |
| PHS99-842 | 1,862 | 44.7 | 32 | 51 | 89 | 57 | 2.3 |
| Promark 220 | 1,668 | 43.6 | 34 | 49 | 91 | 58 | 1.0 |
| Proseed 1492 | 1,897 | 43.7 | 33 | 48 | 90 | 58 | 1.5 |
| Skyhawk | 2,053 | 44.6 | 33 | 47 | 89 | 56 | 3.0 |

* Minot is a Roundup Ready variety.

Growth characteristics and oil content of canola varieties grown near Grygla, seeded May 9, 2000 (continued).

| 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 |
|------------|-------------------------------------|--|------------------------|--------------------|--|-------------------|-----------------------------------|
| | | | 95% Canopy Closure | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | | |
| SW-P98107 | 1,681 | 44.0 | 33 | 50 | 90 | 57 | 1.5 |
| Mean | 1,796 | 44.6 | 33 | 49 | 90 | 56 | 2.2 |
| LSD (0.05) | 284.9 | 1.88 | 1.1 | 0.8 | 2.1 | 4.0 | 1.03 |
| C.V | 11.3 | 3.0 | 2.3 | 1.1 | 1.7 | 5.1 | 33.5 |

Seed yield of Roundup Ready canola (*Brassica napus*) varieties, lb/acre at 8% moisture, at Fosston, Grygla, Red Lake Falls and Roseau in 2000.

Variety information includes Source Codes: (D# = Developer; M# = Marketer) keyed to listing, page 00, and these supplemental codes: H=Hybrid, SP=Specialty oil, Op=Open Pollinated, Syn=Synthetic, LL=Liberty Link, C=Clearfield (Raptor tolerant). **Note:** The Red Lake Falls location was formerly called Crookston. Grygla was a new location in 2000.

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

| Variety | Variety Information | Blackleg Resistance | Roseau | Red Lake Falls | Average, Roseau, Red Lake Falls | Fosston | Grygla | Average, All Sites |
|-----------------|------------------------|------------------------|--------|-------------------|------------------------------------|---------|--------|-----------------------|
| 45A51 | D12,M13, Op | MS | 1,769 | 2,150 | 1,957 | 1,877 | 1,848 | 1,910 |
| 46A52 | D12,M13, Op | MR | 1,777 | 2,047 | 1,898 | 1,526 | 1,788 | 1,777 |
| 7.99 RR | D10,M4, Syn | R | 1,546 | - | - | - | - | - |
| A5152.098 | D2,M4,Op | MS | 1,498 | - | - | - | - | - |
| A99-13NR | D15,M18,Op | R | 1,590 | - | - | - | - | - |
| A99-14NR | D15,M18,Op | R | 1,547 | - | - | - | - | - |
| C5033 RR | D13,M5, Syn | MR | 1,787 | - | - | - | - | - |
| CL2061 | D5,M4, H | MR | 1,505 | - | - | - | - | - |
| ConQuest | D15,M7, Op | R | 1,753 | 2,098 | 1,851 | - | - | - |
| DKL 27-20 | D11,M10, Op | MS | 1,520 | 1,892 | 1,735 | 1,646 | 1,665 | 1,695 |
| DS RoughRider | D2,M15, Op | MS | 1,569 | 1,774 | 1,729 | 1,651 | 1,658 | 1,691 |
| GoldenReady RR | D11,M16, Op | MR | 1,607 | 1,816 | 1,661 | 1,734 | 1,607 | 1,666 |
| Hyola 357 RR | D1,M7, H | MS | 1,818 | 2,156 | 2,034 | - | - | - |
| Hyola 454 RR | D1,M7, H | MR | 1,923 | 2,010 | 1,925 | - | - | - |
| IMC 203 RR | D9,M6, Op | S | 1,498 | 1,795 | 1,672 | - | - | - |
| LG 3235 | D11,M1,Op | MR | 1,686 | 1,984 | 1,771 | 1,783 | 1,829 | 1,788 |
| LG 3345 | D4,M3, Op | MR | 1,756 | - | - | - | - | - |
| LG 3455 | D11,M1,Op | MR | 1,763 | 1,986 | 1,839 | 1,972 | 1,965 | 1,904 |
| LiBred 13.99 RR | D10,M18, Syn | MR | 1,824 | - | - | - | - | - |
| LiBred 4.99 RR | D10,M18,H | R | 1,561 | - | - | - | - | - |
| LiBred 449 RR | D10,M17, Op | R | 1,718 | - | - | - | - | - |
| LiBred 561 RR | D10,M17, Op | R | 1,555 | - | - | - | - | - |
| LS 296 RR | D9,M9, Op | R | 1,769 | 2,284 | 2,031 | - | 1,953 | - |
| Minot | D5,M4, Op | MR | 1,867 | 1,995 | 1,969 | 1,758 | 1,713 | 1,852 |
| NR98-5877 | D14,M18,Op | MR | 1,920 | 2,109 | 2,045 | 1,529 | 1,758 | 1,844 |
| NR98-6008 | D14,M18,Op | MR | 1,913 | 2,123 | 2,047 | 1,836 | 1,731 | 1,915 |
| NR98-6212 | D14,M18,Op | MR | 1,793 | 2,021 | 1,953 | 1,663 | 1,548 | 1,779 |
| NR98-6741 | D14,M18,Op | MR | 1,672 | 1,930 | 1,802 | 1,489 | 1,599 | 1,673 |
| NS3154 | D12,M13, Op | R | 1,832 | - | - | - | - | - |
| NS3587 | D12,M13, H | R | 1,979 | - | - | - | - | - |
| NS3589 | D12,M13, H | R | 1,428 | - | - | - | - | - |
| PR 5338 | D11,M10, Op | MR | 1,708 | 1,989 | 1,777 | 1,717 | 1,790 | 1,765 |
| QT 2.028 | D9,M6, Op | R | 1,636 | 1,900 | 1,756 | - | - | - |
| RaideRR | D13,M5, Op | MR | 1,726 | - | - | - | - | - |
| RideR | D13,M10, Syn | MR | 1,581 | 2,185 | 1,846 | 1,800 | 1,579 | 1,768 |

| Variety | Variety Information | Disease Resistance | Roseau | Red Lake Falls | Average, Roseau, Red Lake Falls | Fosston | Grygla | Average, All Sites |
|-------------|---------------------|--------------------|--------|----------------|---------------------------------|---------|--------|--------------------|
| RR Syn 2677 | D13,M15, Syn | MR | 1,947 | 2,000 | 1,906 | 1,885 | 1,745 | 1,860 |
| RTC 12.2118 | D9,M6, Op | S | 1,683 | 2,033 | 1,883 | - | - | - |
| SW B2674 RR | D13,M18, Syn | MS | 1,702 | 2,027 | 1,906 | - | - | - |
| SW-P9828000 | D14,M18,Syn | R | 1,832 | 2,241 | 2,029 | 2,271 | 1,978 | 2,077 |
| Mean | | | 1,705 | 2,023 | 1,873 | 1,748 | 1,748 | 1,806 |
| LSD (0.05) | | | 335.5 | 255.5 | 211.9 | 156.1 | 271.0 | 125.8 |
| C.V. | | | 14.1 | 7.7 | 11.4 | 6.3 | 10.9 | 10.0 |

Seed yield of non-Roundup Ready canola (*Brassica napus*) varieties, lb/acre at 8% moisture, across years and locations.

Various combinations of the Roseau (R), Red Lake Falls (L), Fosston (F), Kennedy (K), and Grygla (G) yields across locations and years (1998-2000) for varieties grown in these various combinations are presented. **Note:** The Red Lake Falls location was formerly called Crookston.

| Variety | '99-RKF | '99-RK | '99-RF | '99-R | '99-F |
|----------------|----------|--------|--------|-------|-------|
| | '00-RLFG | '00-RL | '00-RL | '00-R | '00-F |
| LiBred 449 RR | - | - | - | 1,542 | - |
| 45A51 | 1,823 | 1,903 | 1,724 | 1,662 | 1,650 |
| 46A52 | - | 1,761 | - | 1,566 | - |
| LiBred 561 RR | - | - | - | 1,467 | - |
| A5152.098 | - | - | - | 1,524 | - |
| CL2061 | - | - | - | 1,619 | - |
| GoldenReady RR | 1,733 | 1,839 | 1,640 | 1,654 | 1,586 |
| Hyola 357 RR | - | 1,935 | 1,810 | 1,735 | - |
| IMC 203 RR | - | - | - | 1,466 | - |
| LG 3235 | 1,750 | 1,775 | 1,677 | 1,592 | 1,661 |
| LG 3345 | - | - | - | 1,640 | - |
| Minot | 1,788 | 1,875 | 1,744 | 1,721 | 1,650 |
| RaideRR | - | - | - | 1,717 | - |
| RideR | - | - | 1,694 | 1,649 | 1,547 |
| DS RoughRider | - | - | - | 1,559 | - |
| SW B2674 RR | - | 1,853 | - | 1,632 | - |
| Mean | 1,774 | 1,849 | 1,715 | 1,609 | 1,619 |

Growth characteristics and oil content of Roundup Ready canola varieties grown near Roseau, seeded May 15, 2000.

| 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 |
|----------------|-------------------------------|--------------------------------------|------------------------|-----------------|--|----------------|-----------------------------|
| | | | 95% Canopy Closure | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | | |
| 45A51 | 1,769 | 49.7 | 34 | 45 | 87 | 38 | 1.8 |
| 46A52 | 1,777 | 47.8 | 33 | 48 | 89 | 39 | 2.0 |
| 7.99RR | 1,546 | 49.3 | 35 | 46 | 86 | 38 | 1.5 |
| A5152.098 | 1,498 | 49.1 | 37 | 45 | 89 | 34 | 1.5 |
| A99-13NR | 1,590 | 47.1 | 35 | 50 | 89 | 43 | 2.0 |
| A99-14NR | 1,547 | 47.5 | 35 | 50 | 89 | 41 | 1.8 |
| C5033 RR | 1,787 | 51.2 | 34 | 45 | 86 | 34 | 1.3 |
| CL2061 | 1,505 | 50.0 | 36 | 46 | 88 | 38 | 2.0 |
| Conquest | 1,753 | 48.6 | 32 | 49 | 89 | 40 | 2.0 |
| DKL 27-20 | 1,520 | 49.0 | 35 | 46 | 86 | 37 | 2.8 |
| DS RoughRider | 1,569 | 50.5 | 36 | 46 | 88 | 36 | 2.5 |
| GoldenReady RR | 1,607 | 48.2 | 36 | 47 | 87 | 38 | 2.5 |
| Hyola 357 RR | 1,818 | 49.0 | 30 | 44 | 86 | 37 | 2.5 |
| Hyola 454 RR | 1,923 | 48.5 | 31 | 48 | 88 | 43 | 2.0 |
| IMC 203 RR | 1,498 | 47.8 | 32 | 49 | 87 | 39 | 2.5 |
| LG3235 | 1,686 | 49.4 | 34 | 44 | 84 | 35 | 1.8 |

Growth characteristics and oil content of Roundup Ready canola varieties grown near Rosseau, seeded May 15, 2000 (continued).

| 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 |
|----------------|-------------------------------------|--|------------------------|--------------------|--|-------------------|-----------------------------------|
| | | | 95% Canopy Closure | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | | |
| LG3345 | 1,756 | 50.9 | 33 | 45 | 86 | 38 | 2.0 |
| LG3455 | 1,763 | 51.2 | 32 | 46 | 87 | 39 | 1.8 |
| LiBred 13.99RR | 1,824 | 47.2 | 36 | 45 | 87 | 39 | 1.8 |
| LiBred 4.99RR | 1,561 | 49.8 | 35 | 45 | 86 | 36 | 1.8 |
| LiBred 449RR | 1,718 | 48.9 | 31 | 45 | 87 | 40 | 2.3 |
| LiBred 561RR | 1,555 | 49.5 | 33 | 47 | 86 | 36 | 1.0 |
| LS 296 RR | 1,769 | 49.2 | 33 | 47 | 86 | 38 | 2.0 |
| Minot | 1,867 | 49.7 | 34 | 45 | 86 | 38 | 2.8 |
| NR98-5877 | 1,920 | 52.6 | 33 | 48 | 89 | 42 | 2.0 |
| NR98-6008 | 1,913 | 49.0 | 32 | 49 | 86 | 40 | 2.5 |
| NR98-6212 | 1,793 | 47.5 | 33 | 48 | 86 | 37 | 1.8 |
| NR98-6741 | 1,672 | 49.8 | 32 | 50 | 89 | 42 | 1.8 |
| NS3154 | 1,832 | 50.1 | 31 | 46 | 87 | 37 | 2.3 |
| NS3587 | 1,979 | 50.4 | 32 | 47 | 86 | 40 | 2.0 |
| NS3589 | 1,428 | 49.5 | 32 | 47 | 86 | 35 | 1.3 |
| PR5338 | 1,708 | 50.4 | 32 | 44 | 85 | 37 | 2.3 |
| QT 2.028 | 1,636 | 48.3 | 33 | 48 | 88 | 38 | 2.8 |
| RaiderR | 1,726 | 48.8 | 33 | 49 | 88 | 39 | 1.0 |
| RiderR | 1,581 | 50.1 | 32 | 45 | 86 | 36 | 1.0 |
| RR SYN 2677 | 1,947 | 49.2 | 34 | 46 | 87 | 38 | 2.0 |
| RTC 12.2118 | 1,683 | 49.5 | 32 | 47 | 87 | 35 | 2.3 |
| SW B2674 RR | 1,702 | 50.1 | 32 | 45 | 86 | 36 | 1.5 |
| SW-P9828000 | 1,832 | 50.0 | 30 | 46 | 86 | 38 | 1.0 |
| Mean | 1,705 | 49.4 | 33 | 46 | 87 | 38 | 1.9 |
| LSD (0.05) | 335.5 | 2.18 | 2.2 | 1.1 | 1.6 | 4.4 | 0.67 |
| C.V. | 14.1 | 3.2 | 4.8 | 1.7 | 1.3 | 8.4 | 25.1 |

Growth characteristics and oil content of Roundup Ready canola varieties grown near Red Lake Falls, seeded April 28, 2000.

| Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Weight at 0% Moisture | Days After Planting to | | | Height, Inches |
|----------------|-------------------------------------|--|------------------------|--|----|-------------------|
| | | | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | | |
| 45A51 | 2,150 | 48.2 | 52 | 96 | 47 | |
| 46A52 | 2,047 | 49.1 | 53 | 96 | 48 | |
| Conquest | 2,098 | 48.1 | 55 | 99 | 47 | |
| DKL 27-20 | 1,892 | 47.8 | 52 | 95 | 46 | |
| DS RoughRider | 1,774 | 53.2 | 52 | 96 | 46 | |
| GoldenReady RR | 1,816 | 48.2 | 52 | 96 | 46 | |
| Hyola 357 | 2,156 | 47.7 | 49 | 95 | 38 | |
| Hyola 454 | 2,010 | 49.9 | 53 | 95 | 48 | |
| IMC 203 RR | 1,795 | 46.8 | 53 | 96 | 40 | |
| LG3235 | 1,984 | 49.7 | 49 | 95 | 39 | |
| LG3455 | 1,986 | 50.3 | 52 | 96 | 47 | |
| LS 296 RR | 2,284 | 48.2 | 52 | 96 | 44 | |
| Minot | 1,995 | 49.3 | 52 | 95 | 41 | |
| NR98-5877 | 2,109 | 51.8 | 53 | 97 | 44 | |
| NR98-6008 | 2,123 | 49.2 | 54 | 95 | 45 | |
| NR98-6212 | 2,021 | 47.9 | 53 | 93 | 46 | |
| NR98-6741 | 1,930 | 47.5 | 54 | 100 | 47 | |
| PR5338 | 1,989 | 50.4 | 52 | 95 | 43 | |

| Variety | Yield, Lb/Acre at 8% moisture | Oil, % of Seed Weight at 0% Moisture | Days After Planting to | | Height, Inches |
|-------------|-------------------------------------|--|------------------------|--|-------------------|
| | | | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | |
| QT 2.028 | 1,900 | 49.3 | 53 | 95 | 44 |
| RideR | 2,185 | 49.0 | 52 | 95 | 50 |
| RR SYN 2677 | 2,000 | 49.6 | 52 | 95 | 49 |
| RTC 12.2118 | 2,033 | 47.2 | 53 | 96 | 43 |
| SW B2674 RR | 2,027 | 47.4 | 52 | 95 | 45 |
| SW-P9828000 | 2,241 | 47.7 | 53 | 98 | 50 |
| Mean | 2,023 | 48.9 | 52 | 96 | 45 |
| LSD (0.05) | 255.5 | 1.50 | 1.1 | 1.7 | 4.0 |
| C.V. | 7.7 | 2.2 | 1.3 | 1.1 | 5.4 |

Growth characteristics and oil content of Roundup Ready canola varieties grown near Fosston, seeded May 10, 2000.

| 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 | | |
| 45A51 | 1,877 | 47.1 | 50 | 91 | 47 | 4.5 |
| 46A52 | 1,526 | 46.1 | 52 | 92 | 47 | 4.5 |
| DKL 27-20 | 1,646 | 45.4 | 50 | 91 | 49 | 5.5 |
| DS RoughRider | 1,651 | 50.2 | 51 | 93 | 46 | 4.8 |
| GoldenReady RR | 1,734 | 45.7 | 51 | 92 | 45 | 5.0 |
| LG3235 | 1,783 | 47.5 | 48 | 88 | 43 | 3.8 |
| LG3455 | 1,972 | 48.6 | 49 | 89 | 45 | 3.0 |
| Minot | 1,758 | 47.9 | 50 | 90 | 45 | 5.5 |
| NR98-5877 | 1,529 | 49.6 | 50 | 93 | 45 | 5.0 |
| NR98-6008 | 1,836 | 46.1 | 52 | 89 | 46 | 4.5 |
| NR98-6212 | 1,663 | 44.5 | 50 | 88 | 44 | 6.5 |
| NR98-6741 | 1,489 | 47.4 | 56 | 93 | 50 | 4.8 |
| PR5338 | 1,717 | 48.5 | 48 | 89 | 43 | 5.0 |
| RideR | 1,800 | 46.3 | 50 | 89 | 47 | 2.5 |
| RR SYN 2677 | 1,885 | 46.9 | 50 | 91 | 48 | 4.5 |
| SW-P9828000 | 2,271 | 47.1 | 50 | 91 | 49 | 3.0 |
| Mean | 1,748 | 47.1 | 50 | 90 | 46 | 4.5 |
| LSD (0.05) | 156.1 | 1.39 | 1.9 | 1.7 | 3.9 | 1.74 |
| C.V. | 6.3 | 2.1 | 2.6 | 1.3 | 6.0 | 27.5 |

| 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 |
|----------------|-------------------------------------|--|------------------------|--------------------|--|-------------------|-----------------------------------|
| | | | 95% Canopy Closure | Beginning Bloom | Maturity: 30% Seed Color Change on Main Raceme | | |
| 45A51 | 1,848 | 45.1 | 34 | 49 | 90 | 55 | 1.8 |
| 46A52 | 1,788 | 44.4 | 33 | 50 | 91 | 57 | 1.8 |
| DKL 27-20 | 1,665 | 44.4 | 34 | 49 | 90 | 55 | 3.8 |
| DS RoughRider | 1,658 | 47.1 | 34 | 49 | 92 | 56 | 3.5 |
| GoldenReady RR | 1,607 | 45.3 | 34 | 49 | 92 | 52 | 3.5 |
| LG3235 | 1,829 | 45.7 | 33 | 47 | 88 | 50 | 2.5 |
| LG3455 | 1,965 | 48.1 | 33 | 49 | 90 | 54 | 1.5 |
| LS 296 RR | 1,953 | 45.1 | 34 | 50 | 90 | 52 | 2.8 |
| Minot | 1,713 | 47.5 | 34 | 49 | 88 | 51 | 2.3 |
| NR98-5877 | 1,758 | 47.8 | 34 | 49 | 92 | 54 | 2.3 |
| NR98-6008 | 1,731 | 44.2 | 33 | 50 | 89 | 51 | 2.8 |
| NR98-6212 | 1,548 | 44.4 | 33 | 50 | 87 | 51 | 2.5 |
| NR98-6741 | 1,599 | 46.4 | 34 | 52 | 92 | 54 | 2.8 |
| PR 5338 | 1,790 | 47.1 | 33 | 48 | 88 | 51 | 2.3 |
| RideR | 1,579 | 44.5 | 33 | 49 | 89 | 55 | 2.0 |
| RR SYN 2677 | 1,745 | 46.5 | 34 | 49 | 89 | 52 | 1.8 |
| SW-P9828000 | 1,978 | 45.1 | 31 | 49 | 90 | 54 | 1.0 |
| Mean | 1,748 | 45.7 | 33 | 49 | 90 | 53 | 2.4 |
| LSD (0.05) | 271.0 | 2.67 | 1.2 | 0.9 | 2.5 | 3.4 | 1.05 |
| C.V. | 10.9 | 4.1 | 2.6 | 1.2 | 2.0 | 4.5 | 31.3 |

Minnesota Seed Producers and Promotion Association (MSPPA)

Since the mid 1970s a large group of Minnesota seed growers has identified and marketed certified public varieties of barley, oats, soybeans and wheat developed at the Minnesota Agricultural Experiment Station and other land-grant universities as MPS Seed. For many years their promotion program included production of The Seed Book, a catalogue of public barley, oat, soybean and wheat varieties they distributed without charge to Minnesota farmers, usually as an insert in *The Farmer* magazine.

These certified seed growers have discontinued publication of their Seed Book and now make a generous contribution to help support the Minnesota Agricultural Experiment Station's production and widespread distribution of this Varietal Trials publication. They continue to promote and market

quality public varieties of barley, oats, soybeans and wheat under the familiar MPS Seed label.

The Minnesota Agricultural Experiment Station appreciates the long-time support of the seedsmen members of MSPPA, their contribution toward the production and distribution of this publication, and their dedication to the production, conditioning and marketing of quality public varieties of farm crops developed here

and at the agricultural experiment stations of other land-grant universities. You will know these seedsmen by the MPS brand label on their certified barley, oat, soybean and wheat seed.





Soybean Maturity Zones.

SOYBEAN

beaton, Waseca, Fairmont and Wainnham and "noninfested" field sites near Fairmont, Lamberton, and Waseca. Planting techniques were the same as the regular performance tests.

Tables on pages 86-89 provide results from variety tests conducted in white-mold-infested sites. Tables on page 79 provide results of the very early (northern Minnesota) and special southeastern Minnesota public variety tests. These locations were added to the program to provide data for environments not represented by the other location tests.

The table on pages 89-91 provides results from special-use soybean variety tests at several locations. These tests were added to provide reliable data for growers interested in producing these types of soybeans, typically grown under contract.

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

Relative Maturity and Calendar Dates of Maturity

Soybeans respond to changing day length, so the actual calendar date of maturity is affected by latitude. Each soybean 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. Maturity date is determined visually by noting the actual date when 95 percent of the pods show their genetically programmed mature color. These dates for 2000 are provided in the tables. Maturity dates in 2000 after September 25 are estimates because widespread frost occurred. Harvest dates are typically 7 to 14 days later, depending upon drying conditions.

Relative maturity ratings for each variety are provided in the tables. 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 to 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. Hendricks, 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, provided by their owners, 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 2000 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.

LSD values associated with the data in these tables are measures of variability within the trials. 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 value 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 2000. Comparing chlorosis scores of varieties permits you to estimate how well they perform relative to each other. Actual chlorosis ratings can vary depending on the specific site and year of test.

Chlorosis symptoms for all varieties in the 2000 tests were much more severe than in previous years. Specific scores and evaluation dates from the 2000 test at both locations are provided on the web at producer.mnsoybean.org.

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

Tables on pages 74 to 79 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. All tests were planted between May 1 and May 25 at planting rates of 160,000 plants/acre. Preplant and postemergence herbicides were used as necessary for good weed control. Row spacings were 30 inches at Becker and Fairmont and 10 inches at all other sites. Plot combines were used to harvest the yield from all plots.

Tables on pages 79 to 85 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 the labeled rates of Roundup®.

Tables on pages 85-86 provides results from the special performance tests of soybean cyst-nematode-resistant varieties in "infested" field sites near Lam-

Some universities and companies use word descriptions rather than numerical scores 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 on mature seed using near infrared reflectance analysis equipment. The table values are for the 2000 season only, absolute values of protein and oil can vary from year to year. Protein and oil values are expressed on a 13-percent-moisture basis. This formula converts the protein and oil values to another moisture basis:

| | | |
|--|---|---|
| $\frac{100\text{-desired moisture}}{87}$ | x | protein or oil value given in the table |
| The value of a bushel of soybeans (APV) based on its oil and protein content can be calculated by: | | |
| $APV = 60 [Po (X) + \frac{Pm (Y)}{.44}]$ | | |
| <i>Where:</i> | | |
| 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) | | |
| <i>And:</i> | | |
| $\frac{\text{* price of meal } \$/\text{ton}}{2,000}$ | = | \$/pound |

Phytophthora

Phytophthora root rot can cause significant yield reductions if susceptible varieties are planted in poorly drained, in-

tested 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. Data tables in this report indicate which Phytophthora gene or genes is/are present in each variety. The "Genes for resistance" chart below shows which genes provide resistance to the various races.

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. Several races of this pest are known to occur in Minnesota and both the area of infestation and numbers of nematodes per unit of soil appear to be increasing. 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, and resistant varieties planted in infested and non-infested fields in southern Minnesota are provided on pages 85-86.

Additional information on procedures for testing your fields for SCN can be obtained from your county extension office or the Soybean Nematology Laboratory 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 and planting in wider row spacings and 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 dependent on 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 plant varieties that consistently show less white mold in several years of testing.

In 2000, adapted soybean varieties were evaluated under field conditions in the three soybean maturity zones in Minnesota; southern, central, and northern. Disease development was promoted by irrigation, inoculation of fields with sclerotia, and rotation with a crop susceptible to white mold. Significant white mold developed at four of the seven locations.

Tests were conducted by J. E. Kurle, Department of Plant Pathology, University of Minnesota. Data collected consisted of ratings of white mold incidence (percentage of plants infected), lodging severity, and yield. Varieties were ranked in order of increasing susceptibility to white mold; the data are presented in tables on pages 86 to 89.

Additional white mold management information is available from Minnesota Soybean Research and Promotion Council, 360 Pierce Avenue, Suite 110, North Mankato, MN 56003, 1-888-896-9678, www.mnsoybean.org.

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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rps1b | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rps1c | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rps1k | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rps3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rps4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rps6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Variety | Brand or Originator | Mature Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|-----------|---------------------|-------------|---------------------|---------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1997-99 | 1998-99 | 1999 | Protein | Oil | | | |
| Lambert | Minn. AES | 9-14 | 57 | 57 | 55 | 35 | 18 | 0.7 | Rps1 | 4.5 |
| W3100 | Wensman | 9-15 | - | - | 62 | 36 | 17 | 1.0 | S | 4.0 |
| 933 | Northstar | 9-15 | - | 62 | 61 | 36 | 17 | 0.9 | S | 4.0 |
| L0983 | CroPlan | 9-15 | - | - | 60 | 36 | 17 | 0.9 | S | 4.5 |
| 6077 | Topfarm | 9-15 | - | 60 | 59 | 33 | 18 | 0.7 | Rps1c | 4.0 |
| K-0999A | Yield King | 9-15 | - | - | 59 | 35 | 18 | 0.8 | S | 4.0 |
| K-0999+ | KSC/Challenger | 9-15 | 64 | 62 | 58 | 36 | 17 | 1.2 | S | 4.0 |
| 910 | Mallard | 9-15 | - | 61 | 58 | 34 | 18 | 1.0 | S | 4.0 |
| 9082 | Dahlco | 9-15 | - | - | 53 | 35 | 17 | 0.8 | Rps1k | 4.0 |
| KB090 | Kaltenberg | 9-16 | - | 65 | 62 | 36 | 17 | 0.9 | S | 4.0 |
| USS120 | US Seeds | 9-16 | - | - | 59 | 35 | 17 | 1.2 | S | 4.0 |
| PB-1221 | Prairie Brand | 9-16 | - | - | 58 | 35 | 17 | 1.2 | S | 4.0 |
| KB111 | Kaltenberg | 9-16 | - | - | 57 | 36 | 17 | 1.1 | S | 4.0 |
| G0906 | Midwest Seed | 9-16 | - | - | 57 | 36 | 17 | 0.9 | S | 4.0 |
| K-0808 | Yield King | 9-16 | - | - | 57 | 34 | 18 | 0.7 | S | 4.0 |
| RS099S | Renk | 9-16 | - | 57 | 54 | 35 | 18 | 0.9 | S | 4.0 |
| K-1415 | Yield King | 9-17 | - | 63 | 62 | 35 | 17 | 1.4 | Rps1 | 4.0 |
| SO1 111 | Sands | 9-17 | - | - | 61 | 35 | 17 | 1.1 | Rps1k | 4.0 |
| DKB13-81 | Dekalb | 9-17 | - | - | 60 | 36 | 17 | 1.3 | S | 4.0 |
| 5121 | Mycogen | 9-17 | 64 | 63 | 60 | 35 | 17 | 1.2 | S | 4.0 |
| E1011 | Topfarm | 9-17 | - | - | 60 | 33 | 18 | 1.1 | Rps1c | 3.5 |
| Kato | Minn. AES | 9-17 | 57 | 56 | 57 | 38 | 16 | 1.3 | Rps1 | 4.0 |
| MN1401 | Minn. AES | 9-17 | 58 | 57 | 57 | 36 | 17 | 1.4 | Rps1 | 4.0 |
| 9122 | Dahlco | 9-17 | - | - | 55 | 36 | 17 | 1.2 | Rps1k | 4.0 |
| 140 Brand | Latham | 9-18 | - | 67 | 64 | 36 | 17 | 1.4 | S | 4.0 |
| 91B53 | Pioneer | 9-18 | - | 65 | 61 | 36 | 17 | 1.5 | S | 4.0 |
| 5155 | Mycogen | 9-18 | - | - | 59 | 35 | 17 | 1.5 | S | 4.0 |
| SO144 | Sands | 9-19 | - | 63 | 65 | 35 | 17 | 1.4 | S | 4.0 |
| W3148 | Wensman | 9-19 | 70 | 67 | 65 | 36 | 17 | 1.4 | S | 4.0 |
| 1142 | Jung | 9-19 | - | 65 | 63 | 36 | 17 | 1.4 | S | 4.0 |
| C9148 | LG Seeds | 9-19 | - | 65 | 63 | 36 | 17 | 1.4 | S | 4.0 |
| X1014 | Mallard | 9-19 | - | - | 63 | 36 | 17 | 1.4 | S | 4.0 |
| M-1172 | Mustang | 9-19 | - | - | 63 | 36 | 17 | 1.7 | S | 4.5 |
| PB-146 | Prairie Brand | 9-19 | 69 | 66 | 63 | 36 | 17 | 1.4 | S | 4.5 |
| Ex8137 | Thompson | 9-19 | - | 64 | 63 | 36 | 17 | 1.3 | S | 4.5 |
| K-1777+ | Kruger | 9-19 | - | - | 62 | 35 | 17 | 1.6 | S | 4.5 |
| Exp1499 | Sands | 9-19 | - | - | 62 | 35 | 17 | 1.7 | Rps1 | 4.0 |
| 1386-6 | Stine | 9-19 | 68 | 66 | 62 | 36 | 17 | 1.3 | S | 4.0 |
| TS2171 | Terning | 9-19 | - | - | 61 | 35 | 17 | 1.5 | Rps1c | 4.5 |
| PB-1421 | Prairie Brand | 9-19 | - | - | 60 | 35 | 17 | 1.4 | Rps1 | 4.0 |
| X016 | NK Brand | 9-19 | - | - | 54 | 34 | 18 | 1.5 | S | 4.5 |
| MIN1391 | Minn. AES | 9-19 | 59 | 58 | 54 | 36 | 17 | 1.3 | Rps1c | 4.0 |
| 1700-6 | Stine | 9-20 | - | - | 69 | 35 | 17 | 1.6 | S | 4.0 |
| T-3144 | Thompson | 9-20 | - | - | 66 | 36 | 17 | 1.4 | S | 4.0 |
| DST-1324 | Dairyland | 9-20 | - | - | 64 | 33 | 18 | 1.8 | S | 5.0 |
| M-1138 | Mustang | 9-20 | 68 | 66 | 64 | 36 | 17 | 1.3 | S | 4.0 |
| PS16 | ProTiseed | 9-20 | - | - | 64 | 36 | 17 | 1.5 | S | 4.5 |
| KB170 | Kaltenberg | 9-20 | - | - | 63 | 35 | 17 | 1.7 | S | 4.5 |
| K-1333 | Kruger | 9-20 | 67 | 66 | 62 | 36 | 17 | 1.3 | S | 4.0 |
| PBR-15X | PBR | 9-20 | - | - | 62 | 35 | 17 | 1.5 | S | 4.5 |
| PBR-174 | PBR | 9-20 | - | - | 62 | 36 | 17 | 1.7 | S | 4.5 |

Brown Stem Rot

Brown stem rot (BSR) is a fungal disease that can cause yield losses in certain situations. The disease occurs most frequently when soybeans follow soybeans, but can occur where soybeans are planted every-other year. Resistant varieties, or longer rotations, assist in the management of this disease. IA 1006, Freeborn, Granite, Faribault, Archer and IA2008R are available public varieties with resistance to BSR while privately developed varieties 2063RR, LO292, 1174WM and L1309CN 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.

Special Use Varieties:

Interest in producing soybeans with special characteristics important to specialty food product manufacturers is increasing. While in the past soybean scientists developed some of these special-use varieties as general releases, more recently some of them have been released under exclusive contracts to specific companies who will contract with growers for their production.

Tables on pages 89 to 91 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

Information about the publicly developed varieties entered in 2000 tests is presented in tables on page 91.

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 |

Sources of privately developed varieties entered in 2000 tests.

| |
|--|
| Agri-Tel Grain, (Agri-Tel), Box 808, Beausejour, Manitoba, R0E0C0, Canada |
| AgriPro Seeds (AgriPro), P.O. Box 250, Brookings, SD 57006-0250 |
| 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 |
| CroPlan Genetics (CroPlan), P.O. Box 64406 MS7455, St. Paul, MN 55164 |
| 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), 3570 Highway H, P.O. Box 958, West Bend, WI 53095 |
| Dennis Ewing Farm Seed (Yield King), 6131 North Fork Road, Ames, IA 50010 |
| Farm Advantage, (Farm Advantage), 1275 Hwy 69, Belmond, IA 50421 |
| Garst Seed Co. (Garst), 2369 330th Street, Box 500, Slater, IA 50244 |
| Gold Country Seed, Inc. (Gold Country), 16506 Hwy. 15 N, Hutchinson, MN 55350 |
| Golden Harvest Seeds (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), Division of W.G. Thompson & Sons, LTD., P.O. Box 130, 145 Marlborough St., Blenheim, Ontario N0P1A0, Canada |
| Hy-Vigor Seeds, (Hy-Vigor), R.R.1, Paullina, IA 51046 |
| Jung Seed Genetics (Jung), 341 S. High St., Randolph, WI 53956 |
| Kaltenberg Seeds (Kaltenberg), 5506 State Hwy 19, Waunakee, WI 53597 |
| 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, Asgrow), 3100 Sycamore Road, De Kalb, IL 60115 |
| Mycogen Seeds, (Mycogen, Mycogen/Atlas), 9330 Zionsville Rd, Indianapolis, IN 46268 |
| Mustang Seed, (Mustang), Box 466, Madison, SD 57042 |
| NorthStar Genetics (Northstar), Box 40, Wanamingo, MN 55983 |
| Novartis Seeds (NK), 7500 Olson Memorial Hwy, Golden Valley, MN |
| Pioneer Hi-Bred International, Inc. (Pioneer), 130 SE Willmar Ave., Willmar, MN 56201 |
| Prairie Brand Research (PBR), 15 X Ave., Story City, IA 50248 |
| Prairie Brand Seed Company (Prairie Brand), 15 X Ave., Story City, IA 50248 |
| Profiseed, Inc. (Profiseed), 1691 Highway 65, Hampton, IA 50441 |
| Ramy International, Ltd. (Ramy), 1329 N. Riverfront Drive, Mankato, MN |
| Renk Seed Co., (Renk) 6800 Wilburn Rd., Sun Prairie, WI 53590 |
| Sand Seed Service, Inc. (Sands), 4765 Highway 143, Marcus, IA 51035 |
| Sansgaard Seed Farms, Inc. (Sansgaard), 15 X Avenue, Story City, IA 50248 |
| Stine Seed Co., (Stine), 2225 Laredo Trail, Adel, IA 50003 |
| Stine Seed Farm, (Stine), 2225 Laredo Trail, Adel, IA 50003 |
| Terning Seeds, (Terning), 15365 60th St. SW, Cokato, MN 55321 |
| Thompson Agronomics, Inc. (Thompson), 40321 130th Avenue, Leland, IA 50453 |
| Thompson Seeds, Inc. (Thompson), 40321 130th Ave., Leland, IA 50453 |
| Top Farm Hybrids (Top Farm), P.O. Box 850, Cokato, MN 55321 |
| Trelay Seeds (Trelay, High Cycle), 11623 State Road 80, Livingston, WI 53544 |
| UAP Seeds (UAP), Box 55, Kasota, MN 56050 |
| 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 |

Performance and characteristics of public and private soybean varieties, northern zone, Crookston, Moorhead and Shelly, 1998-2000.

| Variety | Brand or Originator | Mature Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|----------|---------------------|-------------|---------------------|---------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1997-99 | 1998-99 | 1999 | Protein | Oil | | | |
| Jim | N.D. AES | 9-7 | 39 | 38 | 30 | 34 | 18 | 00.7 | S | 4.0 |
| 90A07 | Pioneer | 9-7 | - | - | 28 | 33 | 19 | 00.7 | S | 4.0 |
| Daksoy | N.D. AES | 9-7 | 32 | 32 | 26 | 33 | 18 | 00.6 | S | 4.5 |
| McCall | Minn. AES | 9-7 | 30 | 29 | 23 | 33 | 19 | 00.7 | S | 4.0 |
| Accord | Agri-Tel | 9-9 | - | - | 34 | 33 | 19 | 00.7 | S | 5.0 |
| Glacier | Minn. AES | 9-10 | 38 | 45 | 36 | 34 | 18 | 00.8 | Rps6 | 4.0 |
| 5007 | Mycogen | 9-11 | - | 41 | 33 | 32 | 19 | 00.6 | S | 4.0 |
| S34 | Mycogen | 9-13 | - | - | 35 | 32 | 18 | 00.9 | S | 4.0 |
| R0725CH | Ramy | 9-13 | - | - | 35 | 32 | 19 | 00.7 | S | 4.0 |
| Agassiz | Minn. AES | 9-14 | 31 | 36 | 29 | 33 | 18 | 0.0 | Rps1 | 4.0 |
| R0800 | Ramy | 9-15 | - | - | 43 | 32 | 18 | 00.8 | S | 5.0 |
| 0005 | Northstar | 9-15 | - | - | 42 | 32 | 18 | 0.1 | S | 5.0 |
| 0002 | Northstar | 9-15 | - | - | 35 | 32 | 18 | 00 | S | 4.0 |
| Trail | N.D. AES | 9-15 | 40 | 44 | 33 | 35 | 17 | 0.0 | Rps1 | 3.5 |
| L0292 | CroPlan | 9-17 | - | 53 | 49 | 32 | 19 | 0.2 | Rps1k | 4.5 |
| 013 | Mycogen | 9-17 | 36 | 42 | 41 | 33 | 18 | 0.1 | Rps1 | 4.5 |
| MN0301 | Minn. AES | 9-17 | 39 | 44 | 41 | 32 | 18 | 0.3 | Rps1 | 4.0 |
| W3030 | Wensman | 9-18 | - | - | 45 | 32 | 18 | 0.3 | S | 4.5 |
| 90B43 | Pioneer | 9-18 | 42 | 49 | 43 | 32 | 18 | 0.4 | Rps1 | 4.0 |
| 0136-0 | Stine | 9-18 | - | - | 41 | 33 | 18 | 0.1 | S | 4.5 |
| 040 | Mycogen | 9-19 | - | - | 47 | 31 | 18 | 0.4 | S | 5.0 |
| 0280 | Stine | 9-19 | - | - | 47 | 32 | 18 | 0.2 | S | 4.5 |
| Ex0300-3 | Stine | 9-19 | - | - | 47 | 32 | 18 | 0.5 | Rps1c | 4.5 |
| 6038 | Topfarm | 9-19 | - | - | 43 | 32 | 18 | 0.3 | S | 4.5 |
| M-0700 | Mustang | 9-20 | 39 | 43 | 41 | 32 | 18 | 0.7 | Rps1 | 5.0 |
| Council | N.D. AES | 9-20 | 40 | 47 | 41 | 33 | 18 | 0.5 | Rps1 | 4.0 |
| DSR-065 | Dairyland | 9-23 | - | - | 46 | 31 | 19 | 0.7 | S | 4.5 |
| Lambert | Minn. AES | 9-24 | 41 | 46 | 42 | 34 | 18 | 0.7 | Rps1 | 4.5 |
| W3070 | Wensman | 9-24 | - | - | 41 | 33 | 18 | 0.7 | S | 5.0 |
| DSR-090 | Dairyland | 9-26 | 39 | 46 | 45 | 34 | 17 | 0.9 | S | 4.0 |
| M-0970 | Mustang | 9-27 | 41 | 45 | 46 | 32 | 18 | 0.9 | Rps1c | 4.5 |
| PB-087 | Prairie Brand | 9-28 | - | 41 | 48 | 33 | 17 | 0.8 | S | 4.5 |
| M-0958 | Mustang | 9-28 | 38 | 42 | 46 | 34 | 17 | 0.9 | S | 4.5 |
| PB-098 | Prairie Brand | 9-29 | 38 | 42 | 45 | 34 | 17 | 0.9 | S | 4.0 |
| LSD 20% | | | 1 | 1 | 2 | | | | | |

Performance and characteristics of public and private soybean varieties, central zone; Becker, Morris and Rosemount, 1998-2000.

| Variety | Brand or Originator | Mature Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|----------|---------------------|-------------|---------------------|---------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1997-99 | 1998-99 | 1999 | Protein | Oil | | | |
| Ex9117 | Thompson | 9-8 | - | - | 43 | 34 | 18 | 1.4 | S | 4.0 |
| 90B43 | Pioneer | 9-9 | - | 56 | 49 | 34 | 18 | 0.4 | Rps1c | 3.5 |
| Barnes | N.D. AES | 9-9 | - | - | 49 | 35 | 18 | 0.2 | Rps6 | 4.5 |
| 525 | Northstar | 9-10 | - | - | 53 | 36 | 17 | 0.5 | S | 4.0 |
| MND301 | Minn. AES | 9-10 | 52 | 50 | 50 | 34 | 18 | 0.3 | Rps1 | 4.0 |
| 9071 | Pioneer | 9-12 | 59 | 57 | 54 | 33 | 18 | 0.7 | Rps1c | 4.0 |
| 91B01 | Pioneer | 9-13 | 60 | 59 | 56 | 34 | 18 | 1.0 | Rps1k | 4.5 |
| MN0901 | Minn. AES | 9-13 | 60 | 59 | 56 | 34 | 18 | 0.9 | Rps1 | 4.5 |
| Exp21175 | Ziller | 9-13 | 61 | 58 | 55 | 35 | 17 | 1.1 | S | 4.5 |
| MN0902CN | Minn. AES | 9-13 | - | 54 | 51 | 36 | 17 | 0.9 | S | 4.0 |
| R1100 | Ramy | 9-14 | - | 65 | 61 | 33 | 18 | 1.1 | S | 3.5 |
| Surge | Minn. & S.D. AES | 9-14 | 62 | 60 | 57 | 36 | 17 | 0.9 | Rps1 | 4.0 |

**Performance and characteristics of public and private soybean varieties, central zone;
Becker, Morris and Rosemount, 1998-2000 (continued).**

| Variety | Brand or Originator | Mature Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|-------------|---------------------|-------------|---------------------|---------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1997-99 | 1998-99 | 1999 | Protein | Oil | | | |
| USS159 | US Seeds | 9-20 | -- | -- | 62 | 36 | 17 | 1.5 | S | 4.0 |
| D155 | Garst | 9-20 | -- | -- | 61 | 35 | 17 | 1.4 | Rps1k | 4.5 |
| PB-184 | Prairie Brand | 9-20 | -- | -- | 59 | 36 | 17 | 1.8 | Rps1k | 4.5 |
| K-1707 | Kruger | 9-21 | -- | -- | 69 | 35 | 17 | 1.5 | S | 4.5 |
| K-1919 | Kruger | 9-21 | -- | -- | 66 | 35 | 17 | 1.7 | S | 4.5 |
| K-1991 | KSC/Challenger | 9-21 | -- | -- | 66 | 35 | 17 | 1.9 | S | 4.5 |
| DSR-180/STS | Dairyland | 9-21 | 67 | 65 | 65 | 36 | 17 | 1.8 | S | 4.5 |
| 2500-7 | Stine | 9-21 | -- | -- | 64 | 36 | 17 | 1.5 | S | 5.0 |
| RS1498 | Renk | 9-21 | -- | 68 | 63 | 36 | 17 | 1.4 | S | 4.5 |
| 9152 | Dahlco | 9-21 | -- | -- | 61 | 36 | 17 | 1.5 | S | 4.0 |
| Parker | Minn. AES | 9-21 | 63 | 64 | 61 | 35 | 17 | 1.5 | Rps1 | 4.5 |
| A1923 | Asgrow | 9-21 | -- | -- | 60 | 35 | 17 | 1.9 | Rps1k | 4.5 |
| L1505 | CroPlan | 9-21 | -- | -- | 60 | 36 | 17 | 1.5 | S | 4.5 |
| Freeborn | Minn. AES | 9-21 | 59 | 58 | 56 | 37 | 17 | 1.6 | Rps1 | 4.0 |
| PBR-180 | PBR | 9-22 | -- | -- | 62 | 36 | 17 | 1.8 | S | 5.0 |
| PBR-18X | PBR | 9-22 | -- | -- | 60 | 36 | 17 | 1.8 | Rps1k | 4.5 |
| CX166 | Dekalb | 9-22 | -- | -- | 58 | 35 | 17 | 1.6 | S | 4.5 |
| K-2125 | KSC/Challenger | 9-23 | 67 | 69 | 65 | 35 | 17 | 1.8 | S | 4.5 |
| TS2110 | Terning | 9-23 | -- | -- | 53 | 37 | 16 | 1.1 | Rps1c | 4.5 |
| K-1943+ | Yield King | 9-24 | 71 | 69 | 68 | 36 | 17 | 1.8 | S | 4.5 |
| K-1777 | KSC/Challenger | 9-24 | 71 | 69 | 65 | 34 | 18 | 1.7 | S | 4.5 |
| LSD 20% | | | 1 | 1 | 2 | | | | | |

**Performance and characteristics of public and private soybean varieties, southern zone;
Waseca, Lamberton and Fairmont, 1998-2000.**

| Variety | Brand or Originator | Mature Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|----------|---------------------|-------------|---------------------|---------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1997-99 | 1998-99 | 1999 | Protein | Oil | | | |
| TS2210 | Terning | 9-13 | -- | -- | 51 | 33 | 18 | 2.1 | Rps1k | 3.5 |
| Kato | Minn. AES | 9-13 | 47 | 44 | 45 | 37 | 17 | 1.3 | Rps1 | 4.0 |
| DKB13-81 | Dekalb | 9-13 | -- | -- | 43 | 36 | 18 | 1.3 | S | 4.0 |
| MN1401 | Minn. AES | 9-15 | 50 | 46 | 48 | 36 | 17 | 1.4 | Rps1 | 4.0 |
| MN1301 | Minn. AES | 9-15 | 49 | 47 | 46 | 36 | 17 | 1.3 | Rps1c | 3.5 |
| K-1707 | KSC/Challenger | 9-17 | -- | -- | 52 | 34 | 18 | 1.6 | S | 4.5 |
| Parker | Minn. AES | 9-17 | 51 | 50 | 51 | 35 | 18 | 1.5 | Rps1 | 4.5 |
| USS159 | US Seeds | 9-18 | -- | -- | 56 | 35 | 18 | 1.5 | S | 4.0 |
| 5191 | Mycogen | 9-18 | -- | -- | 56 | 34 | 18 | 1.9 | Rps1k | 4.0 |
| K-1919 | Kruger | 9-18 | -- | -- | 53 | 35 | 18 | 1.7 | S | 4.0 |
| E1021 | Topfarm | 9-18 | -- | -- | 53 | 35 | 18 | 1.7 | Rps1c | 4.5 |
| Ex7217 | Thompson | 9-18 | -- | -- | 52 | 34 | 18 | 1.8 | S | 5.0 |
| 9152 | Dahlco | 9-18 | -- | -- | 52 | 35 | 18 | 1.5 | S | 4.0 |
| FA1545 | Farm Advantage | 9-18 | -- | -- | 51 | 35 | 18 | 1.5 | S | 4.0 |
| K-1991 | KSC/Challenger | 9-18 | -- | -- | 51 | 35 | 18 | 1.7 | S | 4.5 |
| 91B53 | Pioneer | 9-18 | -- | 54 | 51 | 35 | 18 | 1.5 | S | 4.0 |
| K-2012 | KSC/Challenger | 9-18 | -- | -- | 51 | 35 | 17 | 1.8 | S | 4.5 |
| X1017 | Wallard | 9-18 | -- | -- | 49 | 35 | 18 | 1.7 | S | 4.5 |
| 170 | Trelay | 9-18 | -- | -- | 49 | 35 | 18 | 1.7 | S | 4.5 |
| 1175 | Jung | 9-18 | -- | -- | 49 | 35 | 18 | 1.7 | S | 4.5 |
| 92B23 | Pioneer | 9-18 | 54 | 50 | 49 | 34 | 18 | 2.2 | Rps1k | 4.5 |
| X9919A23 | Garst | 9-18 | -- | -- | 49 | 34 | 18 | 1.9 | S | 4.0 |
| X5117 | Gold Country | 9-18 | -- | -- | 49 | 35 | 18 | 1.7 | Rps1c | 4.5 |

| Variety | Brand or Originator | Mature Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|-----------|---------------------|-------------|---------------------|---------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1997-99 | 1998-99 | 1999 | Protein | Oil | | | |
| GI1777 | Great Lakes | 9-18 | - | - | 49 | 35 | 18 | 1.7 | S | 4.5 |
| FA1734 | Farm Advantage | 9-18 | - | - | 48 | 35 | 18 | 1.7 | S | 4.0 |
| M-1182 | Mustang | 9-18 | - | - | 46 | 36 | 17 | 1.8 | Rps1k | 4.5 |
| Freeborn | Minn. AES | 9-18 | 49 | 46 | 42 | 36 | 17 | 1.6 | Rps1 | 4.0 |
| IA2050 | Iowa AES | 9-19 | - | - | 55 | 34 | 18 | 2.1 | S | 4.5 |
| AP1995 | AgriPro | 9-19 | - | - | 53 | 33 | 18 | 1.9 | Rps1c | 4.0 |
| AP1755 | AgriPro | 9-19 | 54 | 51 | 52 | 35 | 17 | 1.7 | Rps1c | 4.5 |
| 1771 | Viking | 9-19 | - | - | 52 | 35 | 18 | 1.7 | S | 4.5 |
| Exp2092 | Sands | 9-19 | - | - | 52 | 34 | 18 | 2.0 | S | 5.0 |
| MN1801 | Minn. AES | 9-19 | 54 | 52 | 52 | 36 | 17 | 1.8 | Rps1c | 4.5 |
| RS1896 | Renk | 9-19 | - | - | 52 | 35 | 17 | 1.8 | S | 5.0 |
| E1621 | Topfarm | 9-19 | - | - | 51 | 36 | 17 | 1.5 | Rps1k | 4.5 |
| K-1777+ | Kruger | 9-19 | - | - | 51 | 35 | 18 | 1.6 | S | 4.5 |
| IA1006 | Iowa AES | 9-19 | 53 | 50 | 51 | 35 | 18 | 1.6 | Rps1c | 4.5 |
| PB-194 | Prairie Brand | 9-19 | 55 | 52 | 51 | 35 | 18 | 1.9 | S | 4.5 |
| 1700-6 | Stine | 9-19 | - | - | 51 | 35 | 18 | 1.6 | S | 4.0 |
| W3170 | Wensman | 9-19 | - | - | 50 | 35 | 18 | 1.7 | S | 4.5 |
| A1923 | Asgrow | 9-19 | - | - | 50 | 34 | 18 | 1.9 | Rps1k | 4.5 |
| Ex-290 | Latham | 9-19 | - | - | 49 | 35 | 17 | 1.7 | S | 4.5 |
| PSX18 | Profiseed | 9-19 | - | - | 49 | 35 | 17 | 1.8 | Rps1k | 4.5 |
| X9919P93 | Garst | 9-19 | - | - | 49 | 35 | 18 | 1.9 | Rps1k | 4.0 |
| FA2065 | Farm Advantage | 9-19 | - | - | 48 | 35 | 18 | 1.9 | S | 4.5 |
| Hardin 91 | Iowa AES | 9-19 | 53 | 50 | 47 | 35 | 17 | 2.0 | Rps1k | 5.0 |
| CX166 | Dekalb | 9-19 | - | 51 | 47 | 35 | 18 | 1.6 | S | 4.5 |
| 1198A | Jung | 9-19 | - | - | 47 | 35 | 17 | 1.9 | S | 4.5 |
| Ex9242 | Thompson | 9-20 | - | - | 54 | 34 | 18 | 2.0 | S | 5.0 |
| PBR-180 | PBR | 9-20 | - | - | 53 | 35 | 17 | 1.8 | S | 4.5 |
| 1070 | Mallard | 9-20 | - | 52 | 53 | 35 | 17 | 1.9 | S | 4.5 |
| Ex8148 | Thompson | 9-20 | - | - | 52 | 34 | 18 | 1.9 | S | 4.0 |
| KB208 | Kaltenberg | 9-20 | - | - | 52 | 35 | 18 | 2.0 | S | 4.5 |
| Exp40815 | Ziller | 9-20 | - | - | 52 | 35 | 17 | 1.9 | S | 4.5 |
| PS2209 | Profiseed | 9-20 | - | 54 | 51 | 34 | 18 | 2.2 | S | 4.5 |
| 2199 | Viking | 9-20 | - | 53 | 51 | 35 | 18 | 2.1 | S | 4.5 |
| 6197 | Top Farm | 9-20 | - | - | 50 | 35 | 17 | 1.9 | S | 4.5 |
| R1805 | Ramy | 9-20 | - | - | 50 | 35 | 17 | 1.8 | S | 4.5 |
| DSR-243 | Dairyland | 9-20 | - | - | 48 | 34 | 17 | 2.4 | S | 4.5 |
| 9193 | Dahlco | 9-21 | - | - | 55 | 35 | 18 | 1.9 | S | 4.5 |
| 2002 | Northstar | 9-21 | 59 | 54 | 55 | 35 | 17 | 2.0 | S | 4.5 |
| 392Brand | Latham | 9-21 | - | - | 54 | 35 | 17 | 1.9 | S | 4.5 |
| PBR-202 | PBR | 9-21 | 59 | 55 | 54 | 35 | 17 | 2.0 | S | 4.5 |
| G1885 | Midwest Seed | 9-21 | - | - | 54 | 35 | 18 | 1.8 | S | 4.5 |
| SOI 169 | Sands | 9-21 | 58 | 54 | 53 | 35 | 18 | 2.0 | S | 4.0 |
| S-220X | Sansgaard | 9-21 | - | - | 53 | 35 | 17 | 2.2 | S | 4.5 |
| R2198 | Ramy | 9-21 | - | 54 | 52 | 35 | 17 | 2.1 | S | 4.5 |
| L2195 | CroPlan | 9-21 | - | - | 52 | 34 | 18 | 2.1 | S | 4.5 |
| S-191X | Sansgaard | 9-21 | - | - | 52 | 35 | 17 | 1.9 | S | 4.0 |
| A2247 | Asgrow | 9-21 | 55 | 50 | 52 | 35 | 17 | 2.2 | Rps1k | 4.5 |
| T-3226 | Thompson | 9-21 | - | - | 52 | 35 | 18 | 2.2 | S | 4.5 |
| M-2238 | Mustang | 9-21 | - | - | 52 | 34 | 18 | 2.3 | S | 5.0 |
| PB-217 | Prairie Brand | 9-21 | - | 53 | 50 | 34 | 18 | 2.1 | S | 4.5 |
| USS199 | US Seeds | 9-21 | - | - | 50 | 35 | 17 | 1.9 | S | 4.5 |
| 9233 | Pioneer | 9-21 | 57 | 53 | 50 | 35 | 17 | 2.3 | S | 4.5 |
| K-2425 | Yield King | 9-21 | 58 | 52 | 50 | 35 | 17 | 2.2 | S | 4.5 |

Performance and characteristics of public and private soybean varieties, common bean, Waseca, Lambertson and Fairmont, 1998-2000 (continued).

| Variety | Brand or Originator | Mature Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|-----------|---------------------|-------------|---------------------|---------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1997-99 | 1998-99 | 1999 | Protein | Oil | | | |
| K-2343 | KSC/Challenger | 9-21 | 58 | 52 | 50 | 35 | 17 | 2.1 | S | 4.5 |
| Exp2391 | Sands | 9-21 | - | - | 49 | 35 | 17 | 2.2 | S | 4.0 |
| PBR-218 | PBR | 9-21 | 56 | 53 | 49 | 34 | 18 | 2.2 | S | 4.5 |
| DSR-218 | Dairyland | 9-21 | - | 50 | 49 | 35 | 18 | 2.2 | S | 4.5 |
| 3823 | Gold Country | 9-21 | - | - | 46 | 34 | 18 | 2.3 | S | 4.0 |
| IA2021 | Iowa AES | 9-21 | 55 | 49 | 46 | 33 | 18 | 2.1 | Rps1k | 4.5 |
| S20-F8 | NK Brand | 9-21 | - | - | 45 | 34 | 18 | 2.0 | S | 4.0 |
| Sturdy | Minn. AES | 9-21 | 50 | 46 | 45 | 35 | 17 | 2.0 | Rps1 | 4.0 |
| Ex-570 | Latham | 9-22 | - | - | 56 | 34 | 18 | 2.2 | S | 4.5 |
| Clements | Gold Country | 9-22 | - | - | 55 | 35 | 17 | 2.1 | S | 4.5 |
| K-2325+ | Kruger | 9-22 | - | - | 55 | 34 | 18 | 2.2 | S | 4.5 |
| T-3232 | Thompson | 9-22 | - | - | 54 | 35 | 17 | 2.3 | S | 4.5 |
| PB-230 | Prairie Brand | 9-22 | - | - | 54 | 34 | 18 | 2.3 | Rps1 | 4.5 |
| H-1214 | Golden Harvest | 9-22 | - | - | 54 | 34 | 18 | 2.1 | S | 4.5 |
| M-2218 | Mustang | 9-22 | 57 | 53 | 53 | 35 | 17 | 2.1 | S | 4.5 |
| T-3222 | Thompson | 9-22 | 59 | 54 | 53 | 35 | 17 | 2.2 | S | 4.5 |
| M-2251 | Mustang | 9-22 | 56 | 52 | 52 | 34 | 18 | 2.4 | S | 4.5 |
| 207 | Trelay | 9-22 | 56 | 52 | 51 | 35 | 17 | 2.0 | S | 4.5 |
| SOI 236 | Sands | 9-22 | - | - | 51 | 34 | 18 | 2.3 | S | 4.5 |
| FA2177 | Farm Advantage | 9-22 | - | - | 51 | 35 | 17 | 2.1 | S | 4.5 |
| S-237 | Sansgaard | 9-22 | - | 48 | 50 | 34 | 18 | 2.3 | S | 4.5 |
| C9202 | LG Seeds | 9-22 | - | 51 | 49 | 34 | 18 | 2.0 | Rps1c | 4.0 |
| S-228 | Sansgaard | 9-22 | - | - | 48 | 35 | 17 | 2.2 | S | 4.0 |
| RS2498 | Renk | 9-22 | - | 50 | 48 | 36 | 17 | 2.4 | S | 4.5 |
| KB240 | Kaltenberg | 9-23 | - | - | 56 | 34 | 18 | 2.4 | S | 4.5 |
| L2126 | CroPlan | 9-23 | - | - | 53 | 35 | 17 | 2.1 | S | 4.5 |
| S21-P3 | NK Brand | 9-23 | - | - | 53 | 35 | 17 | 2.1 | S | 4.5 |
| H-2411 | Golden Harvest | 9-23 | - | - | 53 | 35 | 17 | 2.4 | S | 4.5 |
| Ex7332 | Thompson | 9-23 | - | - | 53 | 35 | 17 | 2.4 | S | 4.5 |
| S24-K4 | NK Brand | 9-23 | - | - | 52 | 34 | 18 | 2.4 | Rps3 | 4.5 |
| PBR-216 | PBR | 9-23 | 58 | 52 | 52 | 34 | 17 | 2.1 | S | 4.5 |
| 2202 | Hy-Vigor | 9-23 | - | - | 51 | 35 | 17 | 2.2 | Rps1k | 4.5 |
| IA2008R | Iowa AES | 9-23 | 55 | 51 | 51 | 34 | 17 | 2.1 | Rps1k | 4.0 |
| IA2052 | Iowa AES | 9-23 | - | - | 51 | 35 | 17 | 2.3 | S | 4.5 |
| 530 Brand | Latham | 9-23 | - | - | 50 | 35 | 17 | 2.1 | S | 4.0 |
| K-2515 | Yield King | 9-23 | - | - | 49 | 35 | 17 | 2.3 | S | 5.0 |
| L2495 | CroPlan | 9-23 | - | 49 | 49 | 34 | 18 | 2.4 | S | 4.5 |
| L1969 | CroPlan | 9-23 | - | - | 47 | 35 | 17 | 1.9 | Rps1c | 4.0 |
| PB-256 | Prairie Brand | 9-24 | - | - | 54 | 34 | 18 | 2.5 | S | 4.5 |
| USS219 | US Seeds | 9-24 | - | - | 53 | 35 | 17 | 2.1 | S | 4.5 |
| K-2555 | Kruger | 9-24 | - | 51 | 52 | 35 | 17 | 2.4 | S | 4.5 |
| R2498 | Ramy | 9-24 | - | - | 51 | 36 | 17 | 2.4 | S | 4.0 |
| G2215 | Midwest Seed | 9-24 | - | - | 51 | 36 | 17 | 2.2 | S | 4.5 |
| T-3243 | Thompson | 9-24 | - | - | 50 | 36 | 17 | 2.4 | S | 4.0 |
| DKB23-95 | Dekalb | 9-24 | - | - | 50 | 36 | 17 | 2.3 | S | 4.5 |
| C24007 | Crow's | 9-24 | - | - | 50 | 36 | 17 | 2.4 | S | 4.5 |
| PS2500 | ProfiSeed | 9-24 | - | - | 50 | 35 | 17 | 2.4 | S | 5.0 |
| K-2555+ | Yield King | 9-25 | - | - | 49 | 35 | 17 | 2.3 | S | 5.0 |
| K-2505 | Yield King | 9-25 | - | - | 49 | 34 | 17 | 2.3 | S | 4.5 |
| X2013 | Mallard | 9-25 | - | - | 48 | 36 | 17 | 2.3 | S | 4.5 |
| LSD 20% | | | 1 | 1 | 2 | | | | | |

Performance and characteristics of very early maturing soybean varieties, 1996-2000.

| Variety | Maturity Rating | Yield, Bushels/Acre | | | Average | Percent | | Phytophthora Gene | Chlorosis Score |
|---------|-----------------|---------------------|--------|---------|---------|---------|-----|-------------------|-----------------|
| | | Grand Rapids | Roseau | Kennedy | | Protein | Oil | | |
| Daksoy | 00.6 | 24 | 23 | 38 | 26 | 36 | 17 | S | 4.5 |
| McCall | 00.7 | 21 | 22 | 31 | 26 | 36 | 17 | S | 4.0 |
| Jim | 00.7 | 24 | 25 | 34 | 26 | 37 | 17 | S | 4.0 |
| Agassiz | 0.0 | 22 | 22 | 29 | 24 | 37 | 17 | Rps1 | 4.5 |
| Traill | 0.0 | 18 | 21 | 31 | 21 | 37 | 17 | S | 3.5 |
| LSD 20% | | 1 | 2 | 3 | 2 | | | | |

Performance and characteristics of public soybean varieties, southeastern Minn., 1996-2000.

| Variety | Maturity Rating | Yield, Bushels/Acre | Percent | | Phytophthora Gene | Chlorosis Score |
|----------|-----------------|---------------------|---------|-----|-------------------|-----------------|
| | | | Protein | Oil | | |
| Lambert | 0.8 | 38 | 36 | 18 | Rps1 | 4.5 |
| MN1301 | 1.3 | 40 | 36 | 17 | Rps1c | 4.0 |
| Kato | 1.3 | 41 | 38 | 16 | Rps1 | 4.5 |
| Parker | 1.5 | 43 | 36 | 17 | Rps1 | 4.5 |
| Freeborn | 1.6 | 41 | 37 | 17 | Rps1 | 4.0 |
| IA1006 | 1.6 | 45 | 36 | 17 | S | 4.5 |
| Sturdy | 2.0 | 44 | 37 | 16 | Rps1 | 4.0 |
| IA2021 | 2.1 | 44 | 36 | 17 | Rps1k | 4.5 |
| LSD 20% | | 1 | | | | |

Performance and characteristics of Roundup Ready soybean varieties, northern zone; Crookston and Shelly 1999-2000.

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|------------|---------------------|---------------|---------------------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1999-2000 | 2000 | Protein | Oil | | | |
| S00-N7 | NK Brand | 9-16 | - | 34 | 34 | 18 | 0.1 | Rps1c | 4.0 |
| DKB03-51 | Dekalb | 9-17 | - | 38 | 34 | 18 | 0.3 | Rps1 | 4.0 |
| 9314RR | Northstar | 9-17 | - | 37 | 34 | 18 | 0.3 | S | 4.0 |
| 0205RR | Northstar | 9-18 | - | 40 | 34 | 18 | 0.2 | S | 4.0 |
| RR Rugged | Hyland | 9-18 | 44 | 38 | 32 | 19 | 0.3 | S | 4.0 |
| 6020RR | Top Farm | 9-19 | - | 43 | 33 | 18 | 0.2 | S | 4.5 |
| W2039RR | Wensman | 9-19 | 44 | 39 | 32 | 19 | 0.3 | S | 4.5 |
| R200RR | Ramy | 9-19 | - | 39 | 32 | 18 | 0.2 | S | 4.0 |
| 90B31 | Pioneer | 9-19 | 36 | 38 | 33 | 18 | 0.3 | S | 4.0 |
| PBR-0303RR | PBR | 9-19 | 43 | 36 | 33 | 18 | 0.3 | S | 4.0 |
| W2050RR | Wensman | 9-20 | - | 40 | 34 | 18 | 0.5 | Rps1k | 4.5 |
| 903RR | Dahlman | 9-20 | 42 | 39 | 34 | 18 | 0.3 | S | 4.0 |
| S04-E1 | NK Brand | 9-20 | - | 34 | 33 | 18 | 0.4 | Rps1c | 4.0 |
| 9031RR | Dahlco | 9-21 | - | 41 | 32 | 19 | 0.3 | S | 4.0 |
| 6059RR | Top Farm | 9-21 | 44 | 39 | 32 | 18 | 0.5 | S | 4.5 |
| S04-E1 | NK Brand | 9-21 | - | 33 | 31 | 19 | 0.4 | Rps1c | 4.0 |
| H-0537RR | Golden Harvest | 9-22 | - | 44 | 33 | 18 | 0.5 | S | 4.0 |
| AG0801 | Asgrow | 9-23 | - | 42 | 31 | 18 | 0.8 | Rps1k | 3.5 |

Performance and characteristics of Roundup ready soybean varieties, northern zone, Crookston and Shelly 1999-2000 (continued).

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|-------------|---------------------|---------------|---------------------|------|--|---------|-----|-----------------|-------------------|-----------------|
| | | | 1999-2000 | 2000 | | Protein | Oil | | | |
| 0700-4 | Stine | 9-23 | — | 41 | | 35 | 17 | 0.6 | S | 4.0 |
| DKB06-51 | Dekalb | 9-23 | — | 40 | | 32 | 19 | 0.6 | Rps1k | 4.0 |
| PBR-0550RR | PBR | 9-23 | — | 39 | | 32 | 19 | 0.5 | Rps1k | 4.0 |
| RT0313 | CroPlan | 9-23 | — | 38 | | 33 | 19 | 0.3 | S | 3.5 |
| 0200-4 | Stine | 9-23 | — | 36 | | 36 | 16 | 0.4 | S | 4.0 |
| K-077RR | Kruger | 9-24 | — | 40 | | 34 | 18 | 0.5 | S | 4.0 |
| K-077+RR | Kruger | 9-24 | — | 40 | | 35 | 17 | 0.5 | Rps1k | 4.0 |
| W2075RR | Wensman | 9-24 | — | 36 | | 34 | 18 | 0.7 | Rps1k | 4.5 |
| M-079RR | Mustang | 9-25 | 42 | 43 | | 33 | 17 | 0.7 | S | 4.0 |
| K-088RR | Kruger | 9-25 | — | 41 | | 33 | 18 | 0.6 | Rps1k | 4.0 |
| PB-0330RR | Prairie Brand | 9-25 | — | 37 | | 35 | 17 | 0.3 | S | 4.0 |
| K-070RR | Kruger | 9-26 | — | 44 | | 32 | 18 | 0.5 | Rps1k | 4.0 |
| DSR-075/RR | Dairyland | 9-27 | — | 44 | | 32 | 18 | 0.7 | S | 4.0 |
| PB-1030RR | Prairie Brand | 9-27 | 40 | 41 | | 33 | 18 | 0.9 | Rps1c | 4.0 |
| PB-0810RR | Prairie Brand | 9-27 | — | 40 | | 33 | 18 | 0.8 | S | 4.0 |
| PBR-0920RR | PBR | 9-27 | 40 | 38 | | 35 | 17 | 0.9 | S | 4.0 |
| PB-0730RR | Prairie Brand | 9-27 | 39 | 35 | | 31 | 18 | 0.7 | Rps1k | 4.0 |
| M-082RR | Mustang | 9-27 | — | 35 | | 34 | 17 | 0.8 | Rps1k | 4.0 |
| W2070RR | Wensman | 9-27 | — | 35 | | 32 | 18 | 0.7 | Rps1k | 4.5 |
| RT0874 | CroPlan | 9-28 | — | 41 | | 33 | 18 | 0.3 | Rps1k | 4.0 |
| PBR-0990+RR | PBR | 9-28 | — | 39 | | 36 | 16 | 0.9 | S | 4.0 |
| DSR091/RR | Dairyland | 9-29 | 40 | 37 | | 33 | 18 | 0.9 | S | 4.0 |
| 0990-4 | Stine | 9-30 | 37 | 37 | | 33 | 18 | 0.9 | S | 4.5 |
| M-091RR | Mustang | 9-30 | 41 | 37 | | 34 | 17 | 0.9 | S | 4.0 |
| LSD 20% | | | 2 | 3 | | | | | | |

Performance and characteristics of Roundup Ready soybean varieties, central zone Rosemount and Morris 1998-2000.

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|-----------|---------------------|---------------|---------------------|-----------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil | | | |
| RR Rugged | Hyland | 9-12 | — | — | 45 | 34 | 18 | 0.3 | S | 4.5 |
| DKB10-51 | Dekalb | 9-15 | — | — | 53 | 35 | 17 | 1.0 | Rps1c | 4.5 |
| DKB06-51 | Dekalb | 9-15 | — | — | 51 | 34 | 18 | 0.6 | Rps1k | 5.0 |
| BT7101R | Zifler | 9-15 | — | — | 50 | 35 | 18 | 1.0 | S | 4.5 |
| RR Rally | Hyland | 9-15 | — | — | 48 | 36 | 17 | 0.7 | S | 3.5 |
| S09-Y9 | NK Brand | 9-16 | — | — | 57 | 36 | 17 | 0.9 | Rps1c | 4.5 |
| 8097ARR | Jung | 9-16 | — | — | 56 | 36 | 17 | 0.9 | S | 5.0 |
| W2100RR | Wensman | 9-16 | — | — | 56 | 35 | 17 | 1.0 | Rps1c | 4.5 |
| AG0801 | Asgrow | 9-16 | — | 52 | 54 | 34 | 18 | 1.8 | Rps1k | 4.5 |
| H-0979RR | Golden Harvest | 9-16 | — | 51 | 53 | 35 | 18 | 0.9 | S | 4.5 |
| KB100RR | Kaltenberg | 9-16 | — | — | 53 | 35 | 17 | 1.0 | Rps1c | 4.5 |
| 91B02 | Pioneer | 9-16 | 53 | 51 | 51 | 35 | 17 | 1.0 | Rps1c | 5.0 |
| K-099+RR | Kruger | 9-16 | — | 53 | 51 | 35 | 18 | 0.8 | S | 5.0 |
| 0705RR | Northstar | 9-16 | — | — | 51 | 37 | 17 | 0.7 | S | 3.5 |
| RT0744 | CroPlan | 9-16 | — | — | 51 | 34 | 18 | 0.7 | Rps1k | 4.5 |
| 90B93 | Pioneer | 9-16 | 53 | 51 | 51 | 35 | 17 | 0.9 | Rps1c | 4.5 |
| 808RR | Dahlman | 9-16 | — | 50 | 50 | 34 | 18 | 0.8 | S | 4.5 |
| 90B72 | Pioneer | 9-16 | 49 | 47 | 45 | 35 | 17 | 0.7 | Rps1 | 4.0 |
| AG1301 | Asgrow | 9-17 | — | 59 | 60 | 34 | 18 | 1.3 | Rps1 | 4.5 |
| RRX1011 | Malford | 9-17 | — | — | 59 | 35 | 17 | 1.0 | Rps1c | 4.5 |

| Variety | Brand or Originator | Maturity Date | Yield, bushels/acre | | | Percent | | | Phytophthora | Osmosis Score |
|-------------|---------------------|---------------|---------------------|-----------|------|---------|-----|--------|--------------|---------------|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil | Rating | | |
| 3138RR | UAP Midwest | 9-17 | - | - | 54 | 33 | 17 | 1.3 | S | 4.5 |
| 2101RR | High Cycle | 9-17 | - | 55 | 54 | 35 | 17 | 1.0 | S | 4.5 |
| BT7106R | Ziller | 9-17 | - | - | 53 | 35 | 17 | 1.0 | Rps1c | 5.0 |
| PBR-0920RR | PBR | 9-17 | - | 55 | 53 | 37 | 17 | 0.9 | S | 4.5 |
| 2008RR | Dahlman | 9-17 | - | - | 51 | 35 | 18 | 0.8 | Rps1k | 4.5 |
| W2098RR | Wensman | 9-17 | - | - | 51 | 35 | 17 | 0.9 | S | 4.5 |
| 1114RR | Northstar | 9-17 | - | - | 48 | 36 | 17 | 1.1 | S | 4.0 |
| AP11551R | Agripro | 9-17 | - | - | 45 | 36 | 17 | 1.1 | Rps1k | 4.0 |
| M-152RR | Mustang | 9-18 | - | - | 60 | 37 | 16 | 1.5 | S | 4.0 |
| M-091RR | Mustang | 9-18 | - | 56 | 59 | 35 | 17 | 0.9 | S | 5.0 |
| DSR-130/RR | Dairyland | 9-18 | - | - | 58 | 35 | 17 | 1.3 | S | 5.0 |
| K-099A | KSC/Challenger | 9-18 | - | 56 | 57 | 35 | 17 | 0.9 | S | 4.5 |
| G0945R | Midwest Seed | 9-18 | - | - | 57 | 36 | 17 | 0.9 | S | 4.5 |
| 6149RR | Top Farm | 9-18 | - | - | 54 | 35 | 17 | 1.4 | Rps1k | 4.0 |
| RS099RR | Renk | 9-18 | - | 52 | 52 | 33 | 18 | 0.9 | Rps1k | 4.5 |
| USS0909RR | US Seeds | 9-18 | - | - | 51 | 35 | 18 | 0.9 | S | 4.5 |
| S115RR | Mycogen/Atlas | 9-18 | - | - | 51 | 35 | 17 | 1.1 | S | 4.5 |
| 9101RR | Dahlco | 9-18 | - | - | 47 | 36 | 17 | 1.0 | S | 4.0 |
| BT7150R | Ziller | 9-19 | - | 66 | 67 | 32 | 18 | 1.5 | Rps1c | 4.5 |
| K-141 | KSC/Challenger | 9-19 | - | 60 | 62 | 32 | 18 | 1.2 | S | 4.5 |
| L1432RR | LG Seeds | 9-19 | - | - | 62 | 34 | 18 | 1.4 | Rps1k | 4.5 |
| 1015RR | Northstar | 9-19 | - | - | 62 | 35 | 17 | 1.0 | S | 4.5 |
| SOI 1200RR | Sands | 9-19 | - | - | 61 | 34 | 18 | 1.2 | Rps1k | 4.5 |
| AG1602 | Asgrow | 9-19 | - | - | 60 | 33 | 18 | 1.6 | Rps1k | 4.5 |
| M-142RR | Mustang | 9-19 | - | - | 59 | 34 | 18 | 1.4 | Rps1k | 4.5 |
| 9145RR | Dahlco | 9-19 | - | - | 55 | 34 | 18 | 1.4 | S | 4.0 |
| 3123RR | UAP Midwest | 9-19 | - | - | 53 | 33 | 18 | 1.2 | Rps1k | 4.5 |
| 6090RR | Top Farm | 9-19 | - | 50 | 50 | 36 | 17 | 0.9 | S | 4.0 |
| RS159RR | Renk | 9-20 | - | 64 | 68 | 33 | 17 | 1.5 | Rps1c | 4.5 |
| 2152RR | High Cycle | 9-20 | - | - | 67 | 33 | 18 | 1.5 | Rps1c | 4.0 |
| PBR-1620RR | PBR | 9-20 | - | 60 | 66 | 33 | 18 | 1.6 | Rps1c | 4.5 |
| K-133RR | KSC/Challenger | 9-20 | - | - | 65 | 36 | 17 | 1.2 | S | 5.0 |
| BRX1511 | Mallard | 9-20 | - | - | 64 | 36 | 17 | 1.5 | S | 4.0 |
| 6150RR | Top Farm | 9-20 | - | 59 | 64 | 32 | 18 | 1.5 | Rps1c | 4.5 |
| KB161RR | Kaltenberg | 9-20 | - | 60 | 63 | 33 | 18 | 1.6 | Rps1c | 4.5 |
| K-166RR | Kruger | 9-20 | - | - | 62 | 32 | 18 | 1.5 | Rps1c | 4.5 |
| 914RR | Dahlman | 9-20 | - | - | 62 | 34 | 18 | 1.4 | Rps1k | 4.0 |
| H-1565RR | Golden Harvest | 9-20 | - | - | 62 | 33 | 18 | 1.5 | Rps1c | 4.5 |
| PB-1402RR | Prairie Brand | 9-20 | - | - | 60 | 34 | 18 | 1.4 | Rps1k | 4.5 |
| TS5170RR | Terning | 9-20 | - | - | 60 | 33 | 18 | 1.5 | Rps1k | 5.0 |
| K-177RR | Kruger | 9-20 | - | - | 59 | 35 | 17 | 1.8 | S | 4.5 |
| EX-137RR | Latham | 9-20 | - | - | 58 | 36 | 17 | 1.3 | S | 4.5 |
| TS5141RR | Terning | 9-20 | - | - | 58 | 34 | 17 | 1.4 | Rps1k | 4.0 |
| 3149 | UAP Midwest | 9-20 | - | - | 58 | 33 | 18 | 1.4 | Rps1k | 4.5 |
| PB-1202RR | Prairie Brand | 9-20 | - | - | 58 | 35 | 17 | 1.2 | Rps1k | 4.5 |
| VI-151RR | Mustang | 9-21 | - | 62 | 66 | 35 | 17 | 1.5 | Rps1c | 4.0 |
| RT1399 | CroPlan | 9-21 | - | - | 64 | 32 | 18 | 1.3 | Rps1c | 4.5 |
| W2160RR | Wensman | 9-21 | - | - | 60 | 32 | 18 | 1.6 | Rps1c | 4.5 |
| 3900RR | Rainy | 9-21 | - | - | 59 | 35 | 17 | 0.9 | Rps1k | 4.5 |
| XB16-51 | Dekalb | 9-21 | - | - | 58 | 36 | 17 | 1.6 | S | 4.5 |
| 31B52 | Pioneer | 9-21 | 46 | 38 | 55 | 35 | 18 | 1.5 | Rps1k | 4.5 |
| 3158 | UAP Midwest | 9-21 | - | - | 53 | 36 | 17 | 1.5 | S | 4.5 |
| K-199RR/STS | KSC/Challenger | 9-22 | - | - | 64 | 34 | 18 | 1.7 | S | 4.5 |

**Performance and characteristics of Roundup Ready soybean varieties, central zone
Rosemount and Morris 1998-2000 (continued).**

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|------------|---------------------|---------------|---------------------|-----------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil | | | |
| 8137RR | Jung | 9-22 | - | - | 63 | 36 | 17 | 1.3 | S | 4.5 |
| DSR-185/RR | Dairyland | 9-22 | - | - | 61 | 36 | 17 | 1.8 | S | 4.5 |
| W2140RR | Wensman | 9-22 | - | - | 60 | 36 | 17 | 1.4 | S | 4.5 |
| KB150RR | Kaltenberg | 9-22 | - | - | 60 | 36 | 17 | 1.5 | S | 4.5 |
| 917RR | Dahlman | 9-22 | - | - | 60 | 35 | 18 | 1.7 | S | 4.5 |
| SOI 1515RR | Sands | 9-22 | - | - | 59 | 36 | 17 | 1.5 | S | 4.5 |
| Ex0741RR | Thompson | 9-22 | - | - | 59 | 36 | 17 | 1.4 | S | 4.0 |
| DKB19-51 | Dekalb | 9-22 | - | - | 59 | 34 | 18 | 1.9 | Rps1k | 4.0 |
| R1490RR | Ramy | 9-22 | - | - | 58 | 36 | 17 | 1.5 | S | 4.5 |
| Exp 1414RR | Sands | 9-22 | - | 57 | 58 | 36 | 17 | 1.4 | S | 4.5 |
| K-155+RR | Yield King | 9-22 | - | - | 58 | 36 | 17 | 1.4 | S | 4.0 |
| K-188RR | Yield King | 9-23 | - | - | 61 | 35 | 18 | 1.7 | S | 5.0 |
| PB-1246RR | Prairie Brand | 9-23 | - | - | 60 | 37 | 17 | 1.3 | S | 4.5 |
| PB-1540RR | Prairie Brand | 9-23 | - | - | 60 | 35 | 17 | 1.5 | S | 4.0 |
| K-202+RR | Yield King | 9-23 | - | 58 | 59 | 35 | 18 | 1.8 | S | 4.5 |
| S-160XRR | Sansgaard | 9-23 | - | - | 59 | 35 | 17 | 1.6 | S | 5.0 |
| PS4150 | Profiseed | 9-23 | - | - | 58 | 36 | 17 | 1.5 | S | 4.5 |
| 1506-4 | Stine | 9-23 | - | - | 57 | 36 | 17 | 1.4 | S | 4.5 |
| K-199+RR | Yield King | 9-24 | - | - | 61 | 34 | 18 | 1.8 | S | 5.0 |
| PBR-1901RR | PBR | 9-24 | - | - | 59 | 34 | 18 | 1.9 | Rps1k | 5.0 |
| AG1801 | Asgrow | 9-24 | - | - | 58 | 36 | 17 | 1.8 | Rps1 | 4.5 |
| PBR-1930RR | PBR | 9-24 | - | - | 58 | 34 | 17 | 1.9 | Rps1k | 4.5 |
| Ex0751RR | Thompson | 9-24 | - | - | 55 | 34 | 18 | 1.5 | S | 4.5 |
| K-233+RR | Kruger | 9-25 | - | - | 59 | 34 | 18 | 1.8 | S | 4.5 |
| LSD 20% | | | 1 | 2 | 3 | | | | | |

**Performance and characteristics of Roundup Ready soybean varieties, southern zone;
Lamberton and Waseca, 1998-2000.**

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|----------|---------------------|---------------|---------------------|-----------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil | | | |
| 2014RR | Dahlman | 9-18 | - | - | 54 | 34 | 18 | 1.4 | Rps1k | 4.5 |
| H-1565RR | Golden Harvest | 9-19 | - | 52 | 57 | 33 | 18 | 1.5 | Rps1c | 4.0 |
| 91B91 | Pioneer | 9-19 | 54 | 50 | 53 | 35 | 17 | 1.7 | S | 4.5 |
| AP1702 | AgriPro | 9-20 | - | 54 | 57 | 33 | 18 | 1.7 | Rps1c | 4.5 |
| 6016RR | Gold Country | 9-20 | - | - | 55 | 33 | 18 | 1.6 | Rps1c | 4.5 |
| 9201RR | Dahlco | 9-20 | - | - | 50 | 35 | 18 | 2.0 | S | 4.5 |
| 1506-4 | Stine | 9-20 | - | - | 49 | 36 | 18 | 1.4 | S | 4.0 |
| G1710R | Midwest Seed | 9-21 | - | - | 61 | 33 | 18 | 1.6 | Rps1c | 4.5 |
| BT7150R | Ziller | 9-21 | - | - | 57 | 33 | 18 | 1.5 | Rps1c | 4.0 |
| 9160RR | Dahlco | 9-21 | - | - | 55 | 33 | 18 | 1.6 | Rps1c | 4.5 |
| 92B05 | Pioneer | 9-21 | 57 | 53 | 54 | 33 | 18 | 1.9 | Rps1k | 4.5 |
| 91B64 | Pioneer | 9-21 | 55 | 52 | 51 | 33 | 19 | 1.6 | Rps1c | 4.5 |
| PS418 | Profiseed | 9-21 | - | - | 50 | 34 | 18 | 1.8 | Rps1k | 4.5 |
| W2160RR | Wensman | 9-22 | - | - | 64 | 33 | 18 | 1.6 | Rps1c | 4.5 |
| K-166RR | Kruger | 9-22 | - | - | 55 | 32 | 18 | 1.5 | Rps1c | 4.0 |
| GL1501RR | Great Lakes | 9-22 | - | 51 | 52 | 35 | 18 | 2.1 | S | 5.0 |
| Ex187RR | Latham | 9-22 | - | - | 52 | 35 | 18 | 1.5 | S | 4.5 |
| FA7184 | Farm Advantage | 9-22 | - | - | 52 | 33 | 18 | 1.8 | Rps1k | 4.5 |
| 5173RR | Mycogen | 9-22 | - | 52 | 52 | 35 | 18 | 1.7 | S | 4.5 |
| Ex407RR | Latham | 9-22 | - | - | 51 | 34 | 18 | 1.9 | Rps1k | 5.0 |

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|-------------|---------------------|---------------|---------------------|-----------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil | | | |
| PBR-1930RR | PBR | 9-22 | - | - | 51 | 34 | 18 | 1.9 | Rps1k | 4.5 |
| FA7153 | Farm Advantage | 9-22 | - | - | 50 | 36 | 17 | 1.5 | S | 4.5 |
| TS5172RR | Terning | 9-22 | - | - | 50 | 35 | 18 | 1.7 | S | 4.5 |
| RT1948 | CroPlan | 9-22 | - | - | 50 | 34 | 18 | 1.9 | Rps1k | 4.5 |
| C9190RR | LG Seeds | 9-22 | - | 50 | 50 | 35 | 17 | 1.9 | S | 5.0 |
| T-3180RR | Thompson | 9-22 | - | - | 49 | 35 | 18 | 1.8 | S | 4.5 |
| E3193RR | Top Farm | 9-23 | - | - | 58 | 34 | 18 | 1.8 | Rps1k | 5.0 |
| 914RR | Dahlman | 9-23 | - | - | 56 | 34 | 18 | 1.4 | Rps1k | 4.0 |
| 2004RR | Northstar | 9-23 | - | 54 | 56 | 35 | 18 | 2.0 | S | 4.5 |
| 1822RR | Anderson | 9-23 | - | - | 56 | 34 | 18 | 1.8 | Rps1k | 4.5 |
| Ex217RR | Latham | 9-23 | - | - | 56 | 34 | 18 | 1.8 | Rps1k | 4.0 |
| SOI 1800RR | Sands | 9-23 | - | - | 56 | 35 | 18 | 1.8 | Rps1k | 4.0 |
| RS199RR | Renk | 9-23 | - | - | 56 | 33 | 19 | 1.9 | Rps1k | 5.0 |
| BT7191R | Ziller | 9-23 | - | - | 54 | 36 | 18 | 1.9 | S | 4.5 |
| E1971RR | Top Farm | 9-23 | - | - | 54 | 35 | 18 | 1.9 | S | 4.0 |
| KB182RR | Kaltenberg | 9-23 | - | - | 54 | 34 | 18 | 1.8 | Rps1k | 4.5 |
| K-177RR | Kruger | 9-23 | - | - | 53 | 35 | 18 | 1.5 | S | 4.5 |
| 3193RR | UAP Midwest | 9-23 | - | - | 53 | 34 | 18 | 1.9 | Rps1k | 5.0 |
| 6190RR | Top Farm | 9-23 | - | - | 52 | 35 | 18 | 1.9 | S | 4.5 |
| 1120RR | Gold Country | 9-23 | - | - | 52 | 35 | 18 | 2.0 | S | 4.5 |
| 9194RR | Dahico | 9-23 | - | - | 52 | 35 | 18 | 1.9 | S | 4.5 |
| RRX1912 | Mallard | 9-23 | - | - | 50 | 34 | 18 | 1.9 | Rps1k | 4.5 |
| DSR-215/RR | Dairyland | 9-23 | 54 | 50 | 49 | 35 | 18 | 2.0 | S | 5.0 |
| S-22XRR | Sansgaard | 9-23 | - | - | 43 | 34 | 18 | 2.2 | S | 5.0 |
| TS5191RR | Terning | 9-24 | - | - | 58 | 35 | 18 | 1.9 | S | 4.5 |
| 92B36 | Pioneer | 9-24 | - | - | 58 | 34 | 18 | 2.3 | S | 4.5 |
| USS2009RR | US Seeds | 9-24 | - | - | 58 | 35 | 18 | 2.0 | S | 4.5 |
| 8192RR | Jung | 9-24 | - | 55 | 57 | 35 | 18 | 1.9 | S | 4.5 |
| BT7211R | Ziller | 9-24 | - | - | 57 | 36 | 17 | 2.1 | S | 4.5 |
| 2000RR | Viking | 9-24 | - | 55 | 57 | 35 | 17 | 2.0 | S | 5.0 |
| S-2117RR | Sansgaard | 9-24 | - | - | 55 | 35 | 18 | 2.1 | S | 4.5 |
| Ex467RR | Latham | 9-24 | - | - | 55 | 35 | 17 | 2.1 | S | 4.0 |
| AG2001 | Asgrow | 9-24 | - | 51 | 55 | 35 | 18 | 2.0 | Rps1k | 4.5 |
| 1122RR | Gold Country | 9-24 | - | - | 55 | 35 | 18 | 2.2 | S | 4.5 |
| 1991-4 | Stine | 9-24 | 57 | 53 | 54 | 35 | 17 | 2.1 | S | 4.5 |
| CX198RR | Dekalb | 9-24 | - | 53 | 54 | 36 | 17 | 1.9 | S | 4.5 |
| S20-25 | NK Brand | 9-24 | - | - | 54 | 34 | 18 | 2.0 | Rps1 | 4.5 |
| AG2103 | Asgrow | 9-24 | - | - | 54 | 34 | 18 | 2.1 | Rps1k | 4.5 |
| M-179RR | Mustang | 9-24 | - | - | 54 | 35 | 18 | 1.7 | S | 4.5 |
| K-221RR | KSC/Challenger | 9-24 | - | - | 53 | 35 | 18 | 2.0 | S | 5.0 |
| K-222RR | KSC/Challenger | 9-24 | - | - | 53 | 35 | 17 | 2.0 | S | 4.5 |
| 2016-4 | Stine | 9-24 | - | - | 53 | 35 | 17 | 2.0 | S | 4.5 |
| 437RR Brand | Latham | 9-24 | - | - | 52 | 35 | 17 | 2.1 | S | 4.5 |
| T-3200RR | Thompson | 9-24 | - | - | 52 | 35 | 18 | 2.0 | S | 4.5 |
| AG1801 | Asgrow | 9-24 | - | - | 52 | 36 | 17 | 1.8 | Rps1k | 5.0 |
| M-199RR | Mustang | 9-24 | - | 53 | 52 | 35 | 18 | 1.9 | S | 4.5 |
| 8226RR | Jung | 9-24 | - | - | 51 | 35 | 18 | 2.2 | S | 4.5 |
| 819-ARR | Dahlman | 9-24 | - | - | 51 | 35 | 18 | 1.9 | S | 4.5 |
| 2063RR | Anderson | 9-24 | - | 50 | 51 | 35 | 18 | 2.0 | S | 4.5 |
| 2192RR | High Cycle | 9-24 | - | 50 | 51 | 35 | 18 | 1.9 | S | 4.5 |
| 337RR Brand | Latham | 9-24 | - | - | 51 | 35 | 18 | 1.9 | S | 4.5 |
| H-1911RR | Golden Harvest | 9-24 | - | - | 51 | 35 | 18 | 1.9 | S | 4.5 |
| 3206RR | UAP Midwest | 9-24 | - | 48 | 50 | 36 | 17 | 2.0 | S | 4.5 |

Performance and characteristics of non-tannin heavy soybean varieties, southern zone, Lamberton and Waseca, 1998-2000 (continued).

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|------------|---------------------|---------------|---------------------|-----------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil | | | |
| R1980RR | Ramy | 9-24 | - | 51 | 50 | 35 | 18 | 1.9 | Rps1k | 4.5 |
| 917RR | Dahlman | 9-24 | - | 51 | 49 | 35 | 18 | 1.7 | Rps1k | 4.5 |
| RT1921 | CroPlan | 9-24 | - | - | 49 | 35 | 18 | 1.9 | S | 4.5 |
| S24-K4 | NK Brand | 9-25 | - | - | 61 | 34 | 18 | 2.4 | Rps1 | 4.5 |
| AG2302 | Asgrow | 9-25 | - | - | 60 | 35 | 18 | 2.3 | Rps1k | 4.5 |
| K-256RR | Yield King | 9-25 | - | - | 59 | 35 | 17 | 2.3 | S | 4.5 |
| AP2002 | Agripro | 9-25 | - | 51 | 56 | 34 | 17 | 2.0 | Rps1c | 4.0 |
| PBR-2290RR | PBR | 9-25 | - | - | 56 | 35 | 18 | 2.2 | S | 4.5 |
| RS240RR | Renk | 9-25 | - | - | 55 | 35 | 17 | 2.4 | Rps1k | 4.5 |
| 2416-4 | Stine | 9-25 | - | - | 54 | 35 | 17 | 2.4 | Rps1k | 4.5 |
| XR0024A47 | Garst | 9-25 | - | - | 54 | 34 | 18 | 2.3 | S | 4.5 |
| RRX2212 | Mallard | 9-25 | - | - | 53 | 35 | 18 | 2.2 | Rps1k | 4.5 |
| T-3230RR | Thompson | 9-25 | - | - | 53 | 36 | 17 | 2.3 | Rps1k | 4.5 |
| K-202+RR | Kruger | 9-25 | - | 52 | 53 | 34 | 17 | 1.8 | S | 4.5 |
| AG-2501 | Asgrow | 9-25 | - | - | 52 | 35 | 18 | 2.5 | Rps1 | 4.5 |
| XR0023A96 | Garst | 9-25 | - | - | 52 | 36 | 18 | 2.0 | S | 4.5 |
| SOI 244RR | Sands | 9-25 | - | 50 | 51 | 35 | 18 | 2.4 | Rps1k | 4.5 |
| FA7242 | Farm Advantage | 9-25 | - | - | 51 | 36 | 17 | 2.4 | Rps1k | 4.5 |
| 222RR | Hy-Vigor | 9-25 | - | - | 51 | 35 | 18 | 2.2 | S | 4.5 |
| 2271RR | Viking | 9-25 | - | - | 50 | 35 | 17 | 2.2 | Rps1k | 4.5 |
| S-2297RR | Sansgaard | 9-25 | - | 49 | 49 | 35 | 18 | 2.2 | S | 5.0 |
| M-239RR | Mustang | 9-25 | - | 50 | 49 | 35 | 17 | 2.3 | Rps1k | 4.5 |
| Ex507RR | Latham | 9-25 | - | - | 49 | 35 | 18 | 2.1 | S | 4.5 |
| T-3238RR | Thompson | 9-25 | - | - | 48 | 36 | 18 | 2.3 | S | 4.5 |
| S23-Q3 | NK Brand | 9-25 | - | - | 48 | 36 | 17 | 2.3 | Rps1c | 4.5 |
| PB-2121RR | Prairie Brand | 9-26 | - | - | 61 | 35 | 17 | 2.1 | S | 4.5 |
| DSR-228/RR | Dairyland | 9-26 | - | - | 60 | 35 | 17 | 2.2 | S | 4.5 |
| M-222RR | Mustang | 9-26 | - | - | 59 | 34 | 18 | 2.2 | S | 4.5 |
| PS4199 | Profiseed | 9-26 | - | - | 58 | 34 | 18 | 1.9 | Rps1 | 4.5 |
| Exp2459RR | Sands | 9-26 | - | - | 58 | 36 | 17 | 2.4 | S | 4.5 |
| W2198RR | Wensman | 9-26 | - | 58 | 57 | 36 | 17 | 1.9 | S | 4.5 |
| PB-2101RR | Prairie Brand | 9-26 | - | - | 56 | 34 | 17 | 2.1 | Rps1 | 4.5 |
| S240RR | Mycogen | 9-26 | - | - | 56 | 35 | 18 | 2.4 | S | 4.5 |
| 3212RR | UAP Midwest | 9-26 | - | - | 56 | 35 | 17 | 2.1 | S | 4.0 |
| K-223+RR | Kruger | 9-26 | - | - | 56 | 35 | 18 | 1.8 | S | 4.5 |
| K-199+RR | Yield King | 9-26 | - | - | 54 | 34 | 18 | 1.8 | S | 5.0 |
| KB210RR | Kaltenberg | 9-26 | - | - | 54 | 35 | 18 | 2.1 | S | 4.5 |
| DSR-241/RR | Dairyland | 9-26 | 57 | 53 | 53 | 34 | 18 | 2.3 | Rps1k | 5.0 |
| PS4206 | Profiseed | 9-26 | - | - | 52 | 34 | 18 | 2.1 | S | 5.0 |
| C24009RN | Crow's | 9-26 | - | - | 52 | 35 | 17 | 2.2 | S | 4.0 |
| S-2299XRR | Sansgaard | 9-26 | - | - | 52 | 35 | 18 | 2.2 | Rps1 | 4.5 |
| K-266+RR | KSC/Challenger | 9-26 | - | - | 51 | 35 | 17 | 2.2 | Rps1k | 4.0 |
| T-3242RR | Thompson | 9-26 | - | - | 51 | 35 | 17 | 2.4 | Rps1k | 4.5 |
| KB242RR | Kaltenberg | 9-26 | - | 50 | 51 | 34 | 18 | 2.4 | Rps1k | 4.5 |
| DKB23-51 | Dekalb | 9-26 | - | - | 51 | 35 | 18 | 2.3 | Rps1 | 4.5 |
| 2472RR | Hy-Vigor | 9-26 | - | - | 48 | 35 | 18 | 2.4 | Rps1k | 4.5 |
| SOI226RR | Sands | 9-27 | - | - | 60 | 34 | 18 | 2.2 | S | 5.0 |
| FA7227 | Farm Advantage | 9-27 | - | - | 59 | 34 | 18 | 2.2 | S | 5.0 |
| K-250RR | Yield King | 9-27 | - | - | 59 | 34 | 18 | 2.4 | S | 4.5 |
| PBR-2404RR | PBR | 9-27 | - | - | 58 | 36 | 17 | 2.4 | S | 4.5 |
| T-3213RR | Thompson | 9-27 | - | - | 57 | 34 | 18 | 2.1 | S | 4.5 |

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|------------|---------------------|---------------|---------------------|-----------|------|---------|-----|-----------------|-------------------|-----------------|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil | | | |
| 3238RR | UAP Midwest | 9-27 | - | 52 | 56 | 35 | 17 | 2.4 | Rps1k | 4.5 |
| X92304RR | Golden Harvest | 9-27 | - | - | 55 | 35 | 18 | 2.3 | S | 5.0 |
| PB-2430RR | Prairie Brand | 9-27 | - | 51 | 54 | 35 | 17 | 2.4 | Rps1k | 4.5 |
| PB-2397RR | Prairie Brand | 9-27 | - | 51 | 54 | 35 | 18 | 2.3 | S | 4.5 |
| K-244RR | KSC/Challenger | 9-27 | - | - | 52 | 34 | 18 | 2.1 | Rps1k | 4.5 |
| PSX42 | Profiseed | 9-27 | - | - | 51 | 34 | 18 | 2.2 | Rps1 | 4.5 |
| R2220RR | Ramy | 9-27 | - | - | 50 | 35 | 17 | 2.1 | S | 4.5 |
| K-255RR | Yield King | 9-27 | - | - | 50 | 36 | 17 | 2.3 | S | 4.5 |
| G2245R | Midwest Seed | 9-28 | - | - | 56 | 33 | 18 | 2.2 | S | 4.5 |
| PBR-2510RR | PBR | 9-28 | - | - | 55 | 34 | 18 | 2.5 | Rps1 | 4.5 |
| USS2409RR | US Seeds | 9-28 | - | - | 49 | 35 | 17 | 2.4 | Rps1k | 4.5 |
| LSD 20% | | | 1 | 2 | 3 | | | | | |

Performance and characteristics of soybeans in soybean-cyst-nematode-infested (Lamberton, Waseca, Fairmont and Waltham) and non-infested (Fairmont, Lamberton and Waseca) sites, 1998-2000.

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score | SCN Rating |
|--------------|---------------------|---------------|---------------------|-------|------|--------------------|-------|------|---------|-----|-----------------|-------------------|-----------------|------------|
| | | | Infested Sites | | | Non-Infested Sites | | | Protein | Oil | | | | |
| | | | 98-00 | 99-00 | 2000 | 98-00 | 99-00 | 2000 | | | | | | |
| L1309CN | CroPlan | 9-11 | - | - | 47 | - | - | 55 | 34 | 18 | 1.4 | S | 4.0 | S |
| US E131 | US Seeds | 9-11 | - | - | 43 | - | - | 54 | 35 | 17 | 1.8 | Rps1c | 4.0 | S |
| AP1512RR/N | AgriPro | 9-12 | - | - | 43 | - | - | 53 | 35 | 17 | 1.5 | Rps1 | 4.5 | S |
| D151RR/N | Garst | 9-13 | - | - | 44 | - | - | 53 | 35 | 18 | 1.5 | Rps1 | 5.0 | S |
| 1202-4 | Stine | 9-13 | - | - | 39 | - | - | 50 | 34 | 18 | 1.3 | Rps1 | 5.0 | S |
| D177N | Garst | 9-15 | - | - | 46 | - | - | 56 | 36 | 17 | 1.7 | Rps1k | 4.5 | MR |
| DSR-150 | Dairyland | 9-15 | - | 44 | 47 | - | 51 | 52 | 35 | 18 | 1.5 | Rps1 | 4.0 | MR |
| R1605CN | Ramy | 9-16 | - | - | 47 | - | - | 55 | 35 | 18 | 1.8 | S | 4.0 | R |
| EX1202-2 | Stine | 9-16 | - | - | 44 | - | - | 49 | 36 | 17 | 1.3 | S | 4.5 | S |
| C1818N | LG Seeds | 9-18 | - | - | 49 | - | - | 54 | 35 | 17 | 1.8 | S | 4.5 | MR |
| Exp2300N | Sands | 9-19 | - | - | 47 | - | - | 58 | 34 | 18 | 2.3 | Rps1k | 4.5 | S |
| 1892-2 | Stine | 9-19 | - | - | 53 | - | - | 56 | 33 | 18 | 1.8 | S | 4.5 | MR |
| USS189 | US Seeds | 9-19 | - | - | 43 | - | - | 56 | 34 | 18 | 2.2 | S | 4.5 | S |
| Parker | Minn. AES | 9-19 | 42 | 40 | 41 | 53 | 54 | 56 | 34 | 18 | 1.5 | Rps1 | 5.0 | S |
| EX1802-4 | Stine | 9-19 | - | - | 41 | - | - | 51 | 35 | 17 | 1.8 | S | 4.5 | MR |
| X018R | NKBrand | 9-19 | - | - | 36 | - | - | 38 | 36 | 17 | 1.8 | Rps1c | 4.5 | - |
| PB-210N | Prairie Brand | 9-20 | - | - | 53 | - | - | 60 | 34 | 17 | 2.1 | Rps1 | 4.5 | MR |
| K-2220+SCN | Kruger | 9-20 | - | - | 54 | - | - | 58 | 34 | 17 | 2.0 | S | 4.5 | S |
| K-1919+SCN | KSC/Challenger | 9-20 | - | - | 46 | - | - | 56 | 35 | 17 | 1.8 | S | 4.5 | S |
| K-2414SCN | KSC/Challenger | 9-20 | - | - | 49 | - | - | 56 | 35 | 17 | 2.2 | S | 4.5 | MR |
| 9185Cyst | Dahlco | 9-20 | - | - | 52 | - | - | 56 | 34 | 18 | 1.8 | S | 4.5 | MR |
| 5212N | Mycogen | 9-20 | - | 46 | 48 | - | 52 | 54 | 34 | 18 | 2.1 | S | 4.5 | R |
| EX2608 | Thompson | 9-20 | - | - | 48 | - | - | 54 | 35 | 17 | 2.1 | S | 4.5 | MR |
| YK-191RR/SCN | Yield King | 9-20 | - | - | 42 | - | - | 53 | 35 | 17 | 1.8 | S | 4.5 | MR |
| 92B35 | Pioneer | 9-20 | - | 48 | 52 | - | 51 | 53 | 35 | 17 | 2.3 | Rps1 | 4.5 | MR |
| Freeborn | Minn. AES | 9-20 | 47 | 44 | 45 | 51 | 50 | 52 | 36 | 17 | 1.6 | Rps1 | 4.5 | MR |
| PS419RR | Profiseed | 9-20 | - | - | 39 | - | - | 52 | 35 | 17 | 1.9 | S | 4.5 | R |
| PBR-234CN | PBR | 9-21 | - | 48 | 49 | - | 57 | 59 | 35 | 17 | 2.3 | S | 5.0 | R |
| 1882-1 | Stine | 9-21 | 50 | 46 | 49 | 58 | 56 | 59 | 34 | 18 | 1.9 | | 4.5 | S |
| 2181CN | Viking | 9-21 | - | - | 48 | - | - | 59 | 35 | 17 | 2.1 | S | 5.0 | MR |
| EX-632CN | Latham | 9-21 | - | - | 48 | - | - | 58 | 35 | 17 | 2.3 | S | 5.0 | MR |
| IA1008 | Iowa AES | 9-21 | - | 42 | 43 | - | 53 | 57 | 35 | 17 | 1.9 | S | 4.5 | MR |
| R2200CN | Ramy | 9-21 | - | - | 48 | - | - | 57 | 34 | 18 | 2.2 | Rps1k | 4.5 | R |
| T-3236CN | Thompson | 9-21 | 52 | 50 | 51 | 55 | 53 | 56 | 34 | 17 | 2.3 | S | 4.5 | S |
| IA2021 | Iowa AES | 9-21 | 42 | 38 | 37 | 55 | 53 | 56 | 33 | 18 | 2.1 | Rps1k | 4.5 | S |

Performance and characteristics of soybeans in soybean-cyst-nematode-infested (Lamberton, Waseca, Fairmont and Waltham) and non-infested (Fairmont, Lambertson and Waseca) sites, 1998-2000 (continued).

| Variety | Brand or Originator | Maturity Date | Yield, Bushels/Acre | | | | | | Percent | | Maturity Rating | Phytophthora Gene | Chlorosis Score | SCN Rating |
|--------------|---------------------|---------------|---------------------|-------|------|--------------------|-------|------|---------|-----|-----------------|-------------------|-----------------|------------|
| | | | Infested Sites | | | Non-Infested Sites | | | Protein | Oil | | | | |
| | | | 98-00 | 99-00 | 2000 | 98-00 | 99-00 | 2000 | | | | | | |
| 1902-4 | Stine | 9-21 | - | - | 45 | - | - | 56 | 35 | 18 | 2.2 | S | 5.0 | MR |
| 9234 | Pioneer | 9-21 | 48 | 45 | 49 | 53 | 52 | 55 | 35 | 17 | 2.2 | Rps1 | 4.0 | R |
| 352CN Brand | Latham | 9-21 | 50 | 48 | 51 | 54 | 51 | 54 | 34 | 17 | 1.9 | S | 4.5 | MR |
| AP2101N | AgriPro | 9-21 | - | - | 46 | - | - | 51 | 35 | 17 | 2.1 | Rps1k | 4.5 | MR |
| K-2220SCN | KSC/Challenger | 9-22 | 49 | 48 | 48 | 58 | 59 | 61 | 33 | 18 | 2.1 | Rps1k | 4.5 | S |
| T-3219CN | Thompson | 9-22 | 48 | 44 | 45 | 58 | 58 | 60 | 35 | 17 | 2.1 | S | 4.5 | S |
| K-2020SCN | Kruger | 9-22 | - | 48 | 51 | - | 57 | 59 | 33 | 17 | 1.9 | Rps1 | 4.5 | MR |
| IA2036 | Iowa AES | 9-22 | 47 | 44 | 47 | 53 | 52 | 58 | 34 | 17 | 2.1 | S | 4.5 | S |
| Turner | Albert Lee | 9-22 | - | 46 | 47 | - | 51 | 56 | 34 | 18 | 2.2 | S | 4.5 | MR |
| K-252RR/SCN | Kruger | 9-22 | - | - | 47 | - | - | 56 | 35 | 17 | 2.4 | S | 4.5 | MR |
| PB-222CN | Prairie Brand | 9-22 | - | 44 | 46 | - | 54 | 55 | 36 | 17 | 2.2 | Rps1 | 5.0 | MR |
| YK-254RR/SCN | Yield King | 9-22 | - | - | 45 | - | - | 54 | 34 | 18 | 2.4 | S | 4.0 | S |
| 2234CRR | Northstar | 9-22 | - | - | 48 | - | - | 52 | 35 | 17 | 2.2 | S | 4.0 | MR |
| DSR-232/RR | Dairyland | 9-23 | - | - | 48 | - | - | 59 | 35 | 17 | 2.3 | S | 5.0 | S |
| YK-2313SCN | Yield King | 9-23 | - | - | 48 | - | - | 57 | 36 | 17 | 2.2 | S | 4.0 | S |
| K-233RR/SCN | Kruger | 9-23 | - | - | 48 | - | - | 56 | 35 | 17 | 2.2 | S | 5.0 | S |
| Exp2120NRR | Sands | 9-23 | - | - | 46 | - | - | 55 | 34 | 18 | 2.1 | Rps1k | 5.0 | S |
| C9241NRR | LG Seeds | 9-23 | - | 45 | 47 | - | 50 | 53 | 35 | 17 | 2.2 | S | 4.5 | MR |
| PB-2309NRR | Prairie Brand | 9-24 | - | 42 | 46 | - | 52 | 54 | 35 | 17 | 2.3 | S | 4.5 | S |
| AP2212RR/N | Agripro | 9-24 | - | - | 48 | - | - | 54 | 35 | 17 | 2.2 | S | 4.5 | S |
| YK-232RRSCN | Yield King | 9-24 | - | - | 44 | - | - | 53 | 34 | 18 | 2.1 | S | 4.5 | S |
| 2231RR/SCN | High Cycle | 9-24 | - | - | 46 | - | - | 50 | 35 | 18 | 2.3 | S | 4.5 | S |
| H-2348RR | Golden Harvest | 9-25 | - | - | 49 | - | - | 54 | 35 | 17 | 2.3 | S | 4.0 | S |
| D221RR/N | Garst | 9-25 | - | - | 45 | - | - | 52 | 35 | 17 | 2.2 | S | 4.5 | S |
| K-263RRSCN | KSC/Challenger | 9-26 | - | - | 47 | - | - | 51 | 35 | 17 | 2.4 | S | 4.5 | - |
| LSD 20% | | | 1 | 1 | 2 | 1 | 1 | 2 | | | | | | |

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Rosemount, 2000.

| Variety | Brand or Originator | Maturity Rating | White Mold Incidence (%) | Yield, Bu/Acre | Lodging, 1-5 Scale | Performance Rank, High to Low |
|-----------|---------------------|-----------------|--------------------------|----------------|--------------------|-------------------------------|
| 1207-4 | Stine | 1.2 | 0.3 | 58.4 | 1.3 | 1.0 |
| H-1411 RR | Golden Harvest | 1.4 | 0.5 | 58.7 | 2.0 | 2.0 |
| MIN1301 | Minn. AES | 1.3 | 1.5 | 59.0 | 2.0 | 3.0 |
| 91B64 RR | Pioneer | 1.6 | 1.8 | 63.9 | 1.5 | 4.0 |
| 91B53 | Pioneer | 1.5 | 2.0 | 65.9 | 1.8 | 5.0 |
| AG1301 | Asgrow | 1.3 | 2.3 | 44.5 | 1.3 | 6.0 |
| Toyopro | Minn. AES | 0.6 | 2.5 | 48.5 | 1.0 | 7.0 |
| EXP 1191 | Sands | 1.1 | 2.8 | 53.1 | 2.0 | 8.0 |
| 9163 | Pioneer | 1.6 | 3.0 | 58.6 | 3.3 | 10.5 |
| AG0801 | Asgrow | 0.8 | 3.0 | 58.3 | 2.0 | 10.5 |
| CX166 | Dekalb | 1.6 | 3.0 | 50.0 | 1.5 | 10.5 |
| Surge | S.D. and Minn. AES | 0.9 | 3.0 | 58.3 | 2.3 | 10.5 |
| 1506-4 | Stine | 1.4 | 3.3 | 56.6 | 1.5 | 14.5 |
| Kate | Minn. AES | 1.3 | 3.3 | 48.6 | 2.3 | 14.5 |
| MIN 0901 | Minn. AES | 0.9 | 3.3 | 55.7 | 3.3 | 14.5 |
| S09-Y9 | NK Brand | 0.9 | 3.3 | 53.8 | 1.3 | 14.5 |
| AG2102 | Asgrow | 2.1 | 3.5 | 60.1 | 1.5 | 17.5 |
| Minnatto | Minn. AES | 0.9 | 3.5 | 47.3 | 2.0 | 17.5 |

| Variety | Brand or Originator | Maturity Rating | White Mold Incidence (%) | Yield, Bu/Acre | Lodging, 1-5 Scale | Performance Rank, High to Low |
|------------|---------------------|-----------------|--------------------------|----------------|--------------------|-------------------------------|
| EXP 9111 | Thompson | 1.4 | 5.5 | 53.1 | 2.0 | 19.0 |
| 1386-6 | Stine | 1.3 | 5.8 | 56.1 | 1.5 | 20.0 |
| Parker | Minn. AES | 1.5 | 6.3 | 49.1 | 3.5 | 21.0 |
| AP1394 | AgriPro | 1.3 | 6.5 | 56.6 | 2.0 | 22.5 |
| DKB10-51 | Dekalb | 1.0 | 6.5 | 66.6 | 1.3 | 22.5 |
| PB-1246 RR | Prairie Brand | 1.3 | 6.8 | 66.3 | 2.0 | 24.0 |
| 1150 | Hy-Vigor | 1.0 | 8.5 | 50.9 | 3.0 | 25.0 |
| Lambert | Minn. AES | 0.7 | 8.8 | 54.4 | 2.5 | 26.0 |
| Janatto | North Dakota AES | 0.4 | 9.0 | 46.6 | 2.3 | 27.5 |
| VN 0301 | Minn. AES | 0.3 | 9.0 | 45.8 | 3.3 | 27.5 |
| VN 0902 CN | Minn. AES | 0.9 | 9.3 | 56.5 | 2.3 | 29.0 |
| DKB16-51 | Dekalb | 1.6 | 10.3 | 61.3 | 2.8 | 30.0 |
| P1B52 RR | Pioneer | 1.5 | 11.0 | 63.9 | 1.8 | 31.0 |
| DKB13-81 | Dekalb | 1.3 | 11.8 | 65.8 | 1.8 | 32.0 |
| Freeborn | Minn. AES | 1.6 | 13.3 | 41.3 | 5.0 | 33.0 |
| 1101-6 | Stine | 1.1 | 13.8 | 59.1 | 1.8 | 34.0 |
| PB-1221 | Prairie Brand | 1.2 | 17.0 | 60.6 | 1.0 | 35.0 |
| SD 5% | | | 11.4 | 13.4 | 1.0 | |

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Morris, 2000.

| Variety | Brand or Originator | Maturity Rating | White Mold Incidence (%) | Yield, Bu/Acre | Lodging, 1-5 Scale | Performance Rank, High to Low |
|------------|---------------------|-----------------|--------------------------|----------------|--------------------|-------------------------------|
| S09-Y9 | NK Brand | 0.9 | 18.3 | 71.5 | 1.7 | 1.0 |
| P1B64 RR | Pioneer | 1.6 | 21.7 | 74.6 | 2.7 | 2.0 |
| AG1301 | Asgrow | 1.3 | 23.7 | 74.0 | 1.7 | 3.0 |
| EXP 1191 | Sands | 1.1 | 26.7 | 75.8 | 3.7 | 4.0 |
| P1B53 | Pioneer | 1.5 | 30.0 | 77.4 | 2.0 | 5.5 |
| Toyopro | Minn. AES | 0.9 | 30.0 | 55.4 | 2.3 | 5.5 |
| CX166 | Dekalb | 1.6 | 31.7 | 69.4 | 2.3 | 7.0 |
| AG0801 | Asgrow | 0.8 | 33.3 | 68.1 | 3.0 | 8.0 |
| P163 | Pioneer | 1.6 | 35.0 | 64.6 | 3.0 | 9.0 |
| P1B52 RR | Pioneer | 1.5 | 36.7 | 56.7 | 2.3 | 11.0 |
| AG2102 | Asgrow | 2.1 | 36.7 | 56.8 | 2.0 | 11.0 |
| AP1394 | AgriPro | 1.3 | 36.7 | 55.4 | 2.7 | 11.0 |
| DKB10-51 | Dekalb | 1.0 | 38.3 | 65.9 | 2.3 | 13.0 |
| 1207-4 | Stine | 1.2 | 40.0 | 54.6 | 1.7 | 14.0 |
| P-1411 RR | Golden Harvest | 1.4 | 43.3 | 55.4 | 3.0 | 15.5 |
| VN1301 | Minn. AES | 1.3 | 43.3 | 57.3 | 3.3 | 15.5 |
| DKB16-51 | Dekalb | 1.6 | 46.7 | 67.0 | 1.7 | 17.0 |
| 101-6 | Stine | 1.1 | 48.3 | 64.5 | 2.7 | 18.0 |
| DKB13-81 | Dekalb | 1.3 | 48.7 | 69.9 | 2.0 | 19.0 |
| 150 | Hy-Vigor | 1.0 | 50.0 | 64.1 | 2.7 | 20.5 |
| VN 0301 | Minn. AES | 0.3 | 50.0 | 63.1 | 3.7 | 20.5 |
| VN 0902 CN | Minn. AES | 0.9 | 51.7 | 60.1 | 3.7 | 22.0 |
| Janatto | Minn. AES | 1.3 | 53.3 | 51.6 | 3.7 | 23.0 |
| 506-4 | Stine | 1.4 | 55.0 | 57.9 | 1.7 | 24.0 |
| 1386-6 | Stine | 1.3 | 60.0 | 67.9 | 3.3 | 25.5 |
| PB-1246 RR | Prairie Brand | 1.3 | 60.0 | 57.8 | 2.0 | 25.5 |
| PB-1221 | Prairie Brand | 1.2 | 61.7 | 59.2 | 2.0 | 27.0 |
| Janatto | North Dakota AES | 0.4 | 65.0 | 48.2 | 4.3 | 28.5 |
| EXP 9111 | Thompson | 1.4 | 65.0 | 65.4 | 3.7 | 28.5 |

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Morris, 2000 (continued).

| Variety | Brand or Originator | Maturity Rating | White Mold Incidence (%) | Yield, Bu/Acre | Lodging, 1-5 Scale | Performance Rank, High to Low |
|----------|---------------------|-----------------|--------------------------|----------------|--------------------|-------------------------------|
| Surge | S.D. and Minn. AES | 0.9 | 68.3 | 61.1 | 4.7 | 30.0 |
| Minnatto | Minn. AES | 0.9 | 70.0 | 40.9 | 4.0 | 31.0 |
| Parker | Minn. AES | 1.5 | 71.7 | 44.8 | 4.7 | 32.0 |
| Lambert | Minn. AES | 0.7 | 76.7 | 62.8 | 4.3 | 33.5 |
| MN 0901 | Minn. AES | 0.9 | 76.7 | 64.3 | 5.0 | 33.5 |
| Freeborn | Minn. AES | 1.6 | 93.3 | 46.7 | 5.0 | 35.0 |
| LSD 5% | | | 29.9 | 12.2 | 1.2 | |

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Waseca, 2000.

| Variety | Brand or Originator | Relative Maturity | White Mold Incidence (%) | Yield, Bu/Acre | Lodging, 1-5 Scale | Performance Rank, High to Low |
|-------------|---------------------|-------------------|--------------------------|----------------|--------------------|-------------------------------|
| MN 1301 | Minn. AES | 1.3 | 4.5 | 45.7 | 1.0 | 1.0 |
| 91B52 RR | Pioneer | 1.5 | 4.8 | 47.6 | 1.0 | 2.0 |
| S19-90 | NK Brand | 1.9 | 5.5 | 45.7 | 1.0 | 3.0 |
| EX-290 | Latham | 1.7 | 10.5 | 39.7 | 1.5 | 4.0 |
| H-1184 | Golden Harvest | 1.8 | 12.3 | 44.4 | 1.8 | 5.0 |
| 91B53 | Pioneer | 1.5 | 13.3 | 48.3 | 1.5 | 6.0 |
| US E1901 RR | US Seeds | 1.9 | 14.5 | 44.5 | 1.3 | 7.0 |
| AP1394 | AgriPro | 1.3 | 15.3 | 43.9 | 1.5 | 8.0 |
| IA 2021 | Iowa AES | 2.1 | 16.3 | 41.6 | 1.8 | 9.0 |
| DKB19-51 | Dekalb | 1.9 | 16.5 | 41.6 | 1.8 | 10.5 |
| H-2348 RR | Golden Harvest | 2.3 | 16.5 | 33.9 | 1.3 | 10.5 |
| IA 1006 | Iowa AES | 1.6 | 17.3 | 43.3 | 1.8 | 12.0 |
| 207 | Trelay | 2.0 | 18.3 | 41.2 | 2.0 | 13.5 |
| 9163 | Pioneer | 1.6 | 18.3 | 39.7 | 1.8 | 13.5 |
| US E1501 RR | US Seeds | 1.5 | 19.8 | 43.0 | 1.3 | 15.0 |
| EX-187 RR | Latham | 1.5 | 20.0 | 43.7 | 1.0 | 16.0 |
| AG2501 | Asgrow | 2.5 | 22.3 | 38.1 | 1.8 | 17.0 |
| MN1801 | Minn. AES | 1.8 | 23.0 | 45.4 | 2.0 | 18.0 |
| Viking 1771 | Albert Lea | 1.7 | 23.8 | 43.5 | 1.8 | 19.0 |
| AG2001 | Asgrow | 2.0 | 24.3 | 43.6 | 1.5 | 20.5 |
| EX-407 RR | Latham | 1.9 | 24.3 | 37.5 | 1.3 | 20.5 |
| SOI 260 | Sands | 2.0 | 25.3 | 41.1 | 1.5 | 22.0 |
| PB-184 | Prairie Brand | 1.8 | 26.3 | 40.7 | 1.5 | 23.0 |
| US S199 | US Seeds | 1.9 | 26.8 | 42.9 | 2.0 | 24.0 |
| Sturdy | Minn. AES | 2.0 | 27.0 | 40.2 | 1.8 | 25.0 |
| S20-Z5 | NK Brand | 2.0 | 28.5 | 39.0 | 1.8 | 26.0 |
| DSR-218 | Dairyland | 2.2 | 30.0 | 37.5 | 2.0 | 27.0 |
| EXP 1799 RR | Sands | 1.7 | 30.5 | 47.2 | 1.8 | 28.0 |
| 91B64 RR | Pioneer | 1.6 | 31.8 | 40.7 | 1.5 | 29.0 |
| 2500-7 | Stine | 1.5 | 34.0 | 42.1 | 2.3 | 30.0 |
| DKB23-95 | Dekalb | 2.3 | 35.3 | 39.3 | 1.5 | 31.0 |
| AG1923 | Asgrow | 1.9 | 35.5 | 39.7 | 1.8 | 32.0 |
| T-3203 | Thompson | 2.0 | 36.0 | 39.8 | 2.0 | 33.0 |
| AG2102 | Asgrow | 2.1 | 37.5 | 34.2 | 1.3 | 34.0 |
| IA2036 | Iowa AES | 2.1 | 42.3 | 43.7 | 3.3 | 35.0 |
| T-3184 | Thompson | 1.8 | 43.0 | 39.7 | 2.3 | 36.0 |
| AG1801 | Asgrow | 1.8 | 43.5 | 38.1 | 1.5 | 37.0 |
| PB-2121 RR | Prairie Brand | 2.1 | 43.8 | 35.0 | 2.3 | 38.0 |

| Variety | Brand or Originator | Relative Maturity | White Mold Incidence (%) | Yield, Bu/Acre | Lodging 1-5 Scale | Performance Rank, High to Low |
|-------------|---------------------|-------------------|--------------------------|----------------|-------------------|-------------------------------|
| 1700-4 | Stine | 1.6 | 45.0 | 36.6 | 1.3 | 39.0 |
| EXP 2111 RR | Sands | 2.1 | 46.5 | 36.5 | 1.8 | 40.0 |
| LSD 5% | | | 26.6 | 7.3 | 1.0 | |

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Staples, 2000.

| Variety | Brand or Originator | Relative Maturity | White Mold Incidence (%) | Yield, Bu/Acre | Lodging 1-5 Scale | Performance Rank High to Low |
|-------------|---------------------|-------------------|--------------------------|----------------|-------------------|------------------------------|
| 504-E1 | NK Brand | 0.3 | 0.0 | 47.5 | 1.0 | 4.0 |
| 90A07 | Pioneer | 00.7 | 0.0 | 56.9 | 1.0 | 4.0 |
| Jim | Minn. AES | 00.7 | 0.0 | 58.1 | 1.3 | 4.0 |
| Minn. Exp 1 | Minn. AES | 0.3 | 0.0 | 53.9 | 1.0 | 4.0 |
| PB-810 RR | Prairie Brand | 0.8 | 0.0 | 51.0 | 1.3 | 4.0 |
| PBR-0303 RR | PBR | 0.3 | 0.0 | 47.2 | 1.0 | 4.0 |
| UM3 | Minn. AES | 0.3 | 0.0 | 47.6 | 1.0 | 4.0 |
| MN 0301 | Minn. AES | 0.3 | 1.3 | 54.6 | 1.0 | 8.5 |
| Trail | N. D. AES | 0.0 | 1.3 | 51.8 | 1.3 | 8.5 |
| DKB03-51 | Dekalb | 0.3 | 2.5 | 55.9 | 1.5 | 10.0 |
| Agassiz | Minn. AES | 0.0 | 3.8 | 54.0 | 1.5 | 11.5 |
| McCall | Minn. AES | 0.7 | 3.8 | 54.7 | 2.0 | 11.5 |
| LSD 5% | | | 3.5 | 8.5 | 0.7 | |

Performance of special-use soybean varieties, 1998-2000.

| Variety | Releasing Institution | Maturity Date | Yield, Bushels/Acre | | | Percent | |
|--|-----------------------|---------------|---------------------|-----------|------|---------|-----|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil |
| Northern Zone, 1999, 2000; Crookston, Moorhead and Shelly | | | | | | | |
| Jim | N.D. AES | 9-7 | - | 26 | 22 | 32 | 18 |
| Agassiz | Minn. AES | 9-13 | 33 | 28 | 22 | 34 | 18 |
| UM3 | Minn. AES | 9-16 | 33 | 31 | 25 | 34 | 18 |
| Danatto | N.D. AES | 9-22 | 27 | 30 | 28 | 32 | 18 |
| Minnatto | Minn. AES | 9-25 | 30 | 28 | 26 | 35 | 17 |
| Central Zone, 2000; Becker, Morris and Rosemount | | | | | | | |
| MNO301 | Minn. AES | 9-11 | 41 | 41 | 42 | 34 | 18 |
| Danatto | N.D. AES | 9-12 | - | - | 32 | 34 | 17 |
| Lambert | Minn. AES | 9-14 | 47 | 47 | 50 | 35 | 17 |
| Proto | Minn. AES | 9-14 | - | - | 37 | 38 | 15 |
| MNO901 | Minn. AES | 9-15 | 49 | 49 | 52 | 34 | 18 |
| Surge | Minn. & S.D. AES | 9-15 | 50 | 51 | 50 | 36 | 17 |
| Toyopro | Minn. AES | 9-15 | 42 | 43 | 44 | 39 | 15 |
| Minnatto | Minn. AES | 9-15 | 30 | 32 | 33 | 36 | 16 |
| Kato | Minn. AES | 9-17 | 49 | 50 | 49 | 38 | 16 |
| Parker | Minn. AES | 9-18 | - | 51 | 47 | 35 | 17 |
| Southern Zone, Lambertson and Waseca | | | | | | | |
| Parker | Minn. AES | 9-17 | 50 | 50 | 54 | 35 | 18 |
| IA1009 | Iowa AES | 9-18 | - | 52 | 55 | 35 | 17 |
| IA1006 | Iowa AES | 9-19 | 53 | 53 | 57 | 35 | 17 |
| IA1005 | Iowa AES | 9-19 | 52 | 51 | 54 | 36 | 17 |
| IA1007 | Iowa AES | 9-19 | 47 | 44 | 47 | 36 | 17 |
| IA1008 | Iowa AES | 9-20 | - | 54 | 55 | 36 | 17 |
| IA2017 | Iowa AES | 9-22 | 45 | 43 | 53 | 37 | 17 |
| A2041 | Iowa AES | 9-22 | - | 47 | 51 | 39 | 16 |
| A2012 | Iowa AES | 9-22 | 48 | 45 | 50 | 36 | 17 |
| A2011 | Iowa AES | 9-22 | 48 | 43 | 49 | 36 | 17 |

Performance of special-use soybean varieties, 1998-2000 (continued).

| Variety | Releasing Institution | Maturity Date | Yield, Bushels/Acre | | | Percent | |
|--|-----------------------|---------------|---------------------|-----------|------|---------|-----|
| | | | 1998-2000 | 1999-2000 | 2000 | Protein | Oil |
| Southern Zone, Lambertson and Waseca (continued) | | | | | | | |
| A2042 | Iowa AES | 9-22 | - | 45 | 49 | 37 | 16 |
| IA2016 | Iowa AES | 9-22 | 45 | 44 | 47 | 38 | 16 |
| Vinton 81 | Iowa AES | 9-22 | 43 | 42 | 45 | 38 | 16 |
| IA2033 | Iowa AES | 9-23 | 44 | 44 | 48 | 37 | 16 |
| IA2032 | Iowa AES | 9-23 | 45 | 42 | 47 | 37 | 17 |
| IA2027 | Iowa AES | 9-23 | 43 | 41 | 47 | 36 | 17 |
| IA2024 | Iowa AES | 9-23 | 37 | 37 | 41 | 38 | 16 |
| IA2034 | Iowa AES | 9-24 | 51 | 47 | 50 | 38 | 16 |
| IA2020 | Iowa AES | 9-24 | 45 | 42 | 47 | 37 | 16 |
| IA2030 | Iowa AES | 9-24 | 44 | 42 | 46 | 37 | 16 |
| IA2028 | Iowa AES | 9-24 | 45 | 42 | 45 | 36 | 17 |
| IA2035 | Iowa AES | 9-24 | 38 | 37 | 42 | 38 | 16 |
| IA2029 | Iowa AES | 9-24 | 41 | 40 | 42 | 37 | 16 |
| IA2040 | Iowa AES | 9-25 | - | 48 | 53 | 37 | 17 |
| IA2025 | Iowa AES | 9-25 | 44 | 41 | 46 | 38 | 16 |
| IA2023 | Iowa AES | 9-25 | 39 | 38 | 42 | 38 | 15 |
| LSD 20% | | | 1 | 2 | 3 | | |

Characteristics of special-use soybean varieties, 2000.

| Variety | Releasing Institution | Maturity Rating | Special Characteristics | Hilum Color | Phytophthora Gene | Chlorosis Score | Seeds/Pound |
|--|-----------------------|-----------------|----------------------------|-------------|-------------------|-----------------|-------------|
| Northern Zone, 1999,2000; Crookston, Moorhead and Shelly | | | | | | | |
| Jim | N.D. AES | 00.0 | General Purpose | Yellow | S | 4.0 | 2,820 |
| Agassiz | Minn. AES | 0.0 | General Purpose | Buff | Rps1 | 4.5 | 3,047 |
| UM3 | Minn. AES | 0.3 | Small Seed | Yellow | Rps1 | 4.5 | 6,219 |
| Danatto | N.D. AES | 0.4 | Small Seed | Yellow | S | 4.5 | 5,537 |
| Minnatto | Minn. AES | 0.7 | Small Seed | Yellow | Rps1 | 4.5 | 5,341 |
| Central Zone, 2000; Becker, Morris and Rosemount | | | | | | | |
| MN0301 | Minn. AES | 0.3 | General Purpose | Yellow | Rps1 | 4.0 | 2,752 |
| Danatto | N.D. AES | 0.4 | Small Seed | Yellow | S | 4.5 | 4,633 |
| Lambert | Minn. AES | 0.7 | General Purpose | Buff | Rps1 | 4.5 | 2,671 |
| Proto | Minn. AES | 0.5 | High Protein | Yellow | S | 4.5 | 2,402 |
| MN0901 | Minn. AES | 0.9 | General Purpose | Black | Rps1 | 4.5 | 2,838 |
| Surge | Minn. & S.D. AES | 0.9 | Higher Protein | Yellow | Rps1 | 4.0 | 2,204 |
| Toyopro | Minn. AES | 0.9 | High Protein | Yellow | S | 4.0 | 2,892 |
| Minnatto | Minn. AES | 0.9 | Small Seed | Yellow | Rps1 | 4.5 | 4,633 |
| Kato | Minn. AES | 1.3 | Large Seed, Higher Protein | Black | Rps1 | 4.0 | 2,073 |
| Parker | Minn. AES | 1.5 | General Purpose | Buff | Rps1 | 4.5 | 2,580 |
| Southern Zone, Lambertson 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 | 5.0 | 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 Lipoygenase 2 | Yellow | S | 4.5 | 2,248 |
| IA2042 | Iowa AES | 2.1 | Large Seed, High Protein | Yellow | S | 4.5 | 2,027 |

| Variety | Releasing Institution | Maturity Rating | Special Characteristics | Hilum Color | Phytophthora Gene | Chlorosis Score | Seeds/Pound |
|--|-----------------------|-----------------|--------------------------|-------------|-------------------|-----------------|-------------|
| <i>Southern Zone, Lambert and Waseca (continued)</i> | | | | | | | |
| 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 | 4.5 | 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 |

Publicly developed soybean varieties entered in 2000 tests.

| Variety | Releasing Institution | Maturity Rating | Phytophthora Gene | BSR Reaction | SCN Reaction | Chlorosis Score |
|-----------|-----------------------|-----------------|-------------------|--------------|--------------|-----------------|
| Daksoy | N.D. AES | 00.6 | S | S | S | 4.5 |
| Jim | N.D. AES | 00.7 | S | S | S | 4.0 |
| McCall | Minn. AES | 00.7 | S | S | S | 4.0 |
| Glacier | Minn. AES | 00.8 | Rps6 | S | S | 4.0 |
| Agassiz | Minn. AES | 0.0 | Rps1 | S | S | 4.0 |
| Trail | N.D. AES | 0.0 | S | S | S | 3.5 |
| Barnes | N.D. AES | 0.2 | Rps6 | S | S | 4.5 |
| MN0301 | Minn. AES | 0.3 | Rps1 | S | S | 4.0 |
| Council | N.D. AES | 0.5 | Rps1 | S | S | 4.0 |
| Lambert | Minn. AES | 0.7 | Rps1 | S | S | 4.5 |
| Hendricks | Minn. + S.D. AES | 0.9 | Rps1 | S | S | 4.0 |
| MN0901 | Minn. AES | 0.9 | Rps1 | S | S | 4.5 |
| MN0902CN | Minn. AES | 0.9 | Rps1 | R | R | 4.0 |
| Surge | S.D. + Minn. AES | 0.9 | Rps1 | S | S | 4.0 |
| MN1301 | Minn. AES | 1.3 | Rps1c | S | S | 3.5 |
| Kato | Minn. AES | 1.3 | Rps1 | S | S | 4.0 |
| MN1401 | Minn. AES | 1.4 | Rps1 | S | S | 4.0 |
| Parker | Minn. AES | 1.5 | Rps1 | S | S | 4.5 |
| Freeborn | Minn. AES | 1.6 | Rps1 | R | R | 4.0 |
| IA1006 | Iowa AES | 1.6 | S | R | S | 4.5 |
| MN1801 | Minn. AES | 1.8 | Rps1c | S | S | 4.5 |
| IA1009 | Iowa AES | 1.9 | S | S | R | 4.5 |
| Hardin 91 | Iowa AES | 2.0 | Rps1k | S | S | 5.0 |
| Sturdy | Minn. AES | 2.0 | Rps1 | S | S | 4.0 |
| IA1008 | Iowa AES | 2.0 | S | S | R | 5.0 |
| IA2008R | Iowa AES | 2.1 | Rps1k | R | S | 4.0 |
| IA2021 | Iowa AES | 2.1 | Rps1k | S | S | 4.0 |
| IA2036 | Iowa AES | 2.1 | S | S | R | 5.0 |
| IA2050 | Iowa AES | 2.1 | S | S | S | 4.5 |
| Turner | S.D. AES | 2.2 | S | S | R | 4.5 |
| IA2052 | Iowa AES | 2.3 | S | R | S | 4.5 |

Minnesota Crop Improvement Association

Minnesota Crop Improvement Association (MCIA), an independent, non-profit association, is Minnesota's official seed certification and noxious weed-seed-free forage and mulch certifying agency. It also provides Identity Preserved, Quality Assurance and prevariety certification of forest reproductive materials and native grasses and forbs services to members. Its Foundation Seed Department distributes Foundation seed of public varieties and provides contract production services for private companies. MCIA's seed purity and germination laboratory provides certification and special-service testing to members.

In 2000 MCIA became exclusive marketing agent for new University of Minnesota field crop varieties and advanced genetic material.

For information about any MCIA service contact Gary Beil, MCIA President and CEO, 1900 Hendon Avenue, St. Paul, MN 55108, phone 800-510-6242, fax 612-625-3748.

Registered and Certified Seed Sources

Sources of Registered and Certified seed of crop varieties grown for certification in Minnesota in 2000 are in the list beginning below.

MCIA inspected of these seed fields of these growers. To be eligible for final certification the seed produced on these fields must be sampled, tested and inspected by MCIA after conditioning.

The term "certified" is broadly applied to three classes of seed, Foundation, Registered and Certified. Registered seed is grown from Foundation seed and Certified seed is usually grown from Registered seed, though Certified seed of some varieties is grown directly from the Foundation seed class.

Certified seed transported across state lines must comply with the stipulations of the Federal Seed Act and with seed laws and regulations of the state into which it is transported. Seed tagged with MCIA certification tags or for which an MCIA bulk certification certificate has been issued has been grown, conditioned, sampled and tested according to MCIA regulations and meets applicable requirements of the Minnesota Department of Agriculture.

This listing 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 the sale of seed.

Notice to Seed Buyers

Should you ever suspect misrepresentation, mislabeling or violation of the regulations under which certified seed classes are produced and marketed, contact MCIA at the address in column one.

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 addressed to 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.

It is the responsibility of the seller of certified seed to supply seed representative of the samples submitted and approved for certification by MCIA. Purchasers of seed should insist on certification being complete, with certified seed tags attached to bags or a bulk sale certificate issued for bulk seed lots.



Sources of Registered and Certified seed. 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 | | | |
|-----------------|---|--------------|-----|
| Excel | | | |
| Kittson | Weinlaender Seed Company, Drayton | 701-454-6427 | R |
| Marshall | Kowalski, James, Stephen | 218-478-3899 | R |
| Foster | | | |
| Douglas | Sward Seed Farm, Nelson | 320-762-0143 | C |
| Hazen | | | |
| Todd | Faust, Kevin, Long Prairie | 320-732-3361 | R |
| Wright | Dafako Seeds, Inc., Kokato | 320-286-5982 | C |
| Lacey | | | |
| Clay | Pearson, Carol G., Georgetown | 218-861-6668 | R |
| Clay | Petermann Seeds, Inc., Hawley | 218-483-3302 | R |
| Clay | Yang, Gordon & Sons, Felton | 218-494-3643 | R |
| Grant | Adams Seed, Wendell | 218-458-2151 | R |
| Grant | Lacey Company, Gerald A., Wendell | 218-458-2595 | R |
| Kittson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | R |
| Kittson | Carlson, James A., Hallowell | 218-843-3483 | R |
| Kittson | Jensen, A. Gay Farms Co., Drayton | 701-454-6294 | R |
| Kittson | Petersen, Ronald L., Lake Bronson | 218-754-4631 | R |
| Kittson | Rickesberg, Jeff, Kennedy | 218-674-4231 | R |
| Kittson | Weinlaender Seed Company, Drayton | 701-454-6427 | R |
| Marshall | Backstrom Farms, Inc., Warren | 218-745-5113 | R |
| Marshall | Jensen Farms, Stephen | 218-478-3398 | R |
| Marshall | Kowalski, James, Stephen | 218-478-3899 | R |
| Marshall | Peterson, Maynard, Stephen | 218-478-3859 | R |
| Marshall | Riopelle, Jack L., Argyle | 218-437-8147 | R |
| Marshall | Rivard Farms, Inc., Argyle | 218-437-6479 | R |
| Meecker | Wigen Seed Farm, Litchfield | 320-693-8182 | R |
| Norman | Brandt, Wayne G. & John, Ada | 218-784-4774 | R |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | R |
| Norman | Circle C Seeds, Gary | 218-356-8214 | R |
| Pennington | Engelstad Farms of Rocksbury, Thief River Falls | 218-681-1000 | R |
| Pennington | Schohn Farms, Thief River Falls | 218-964-5268 | R |
| Pennington | Swanson, Curtis W., Thief River Falls | 218-964-5619 | R |
| Polk | Capistras, Kevin, Crookston | 218-281-5705 | R |
| Polk | Capistras, Wayne, Crookston | 218-281-5705 | R |
| Polk | Peterson, Douglas, E. Grand Forks | 218-773-9120 | R |
| Polk | Ross Seed Co., Fisher | 218-891-2211 | R |
| Polk | Thorsen Farm, Inc. J.O., E. Grand Forks | 218-893-2285 | R |
| Roseau | Habstritt Farms, Inc., Roseau | 358-463-1193 | R |
| Wikas | Friedrichs Farm, Foxhome | 218-643-2363 | R |
| Wikin | Knapp Seed Farm, Inc., Foxhome | 218-739-3366 | R |
| Logan | | | |
| Pipestone | Skyline Production System, Woodstock | 507-777-4262 | C R |
| R/NBrite | | | |
| Pipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | R |
| Robust | | | |
| Clay | Bredy Farms, Inc., Moorhead | 218-236-8082 | C |

| | | | |
|------------|--|--------------|-----|
| Clay | Heartland Seeds, Moorhead | 218-585-4621 | C R |
| Clay | Hurner, Craig, Glyndon | 218-236-6790 | C |
| Clay | Olek, Bradley, Felton | 218-494-3440 | C |
| Clay | Olek, Vernard, Felton | 218-494-3440 | C |
| Clay | Tobolt Seed, Moorhead | 218-287-2904 | R |
| 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 R |
| Grant | Adams Seed, Wendell | 218-458-2151 | C |
| Grant | Lacey Company, Gerald A., Wendell | 218-458-2595 | R |
| Kittson | Carlson, James A., Hallock | 218-843-3483 | C |
| Mahnomen | Greenhills, Inc., Mahnomen | 218-935-2446 | R |
| Mahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | C |
| Marshall | Anderson, Harvey O. & Luther H., Stephen | 218-455-3305 | R |
| Marshall | Double A Farms, Viking | 218-523-4245 | C |
| Marshall | Farmers Elevator Company, Alvarado | 218-965-4812 | R |
| Meeker | Peterson, Melvin, Atwater | 320-877-7585 | C |
| Meeker | Peterson, Russell M., Grove City | 320-877-7793 | C |
| Meeker | Wigen Seed Farm, Litchfield | 320-693-8182 | C |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | C |
| Murray | Blankers, Jerry, Lake Wilson | 507-879-3103 | R |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | R |
| Norman | Kveno, Harry, Gary | 218-356-8278 | R |
| Norman | Malme, Cecil, Shelly | 218-886-8488 | C |
| Otter Tail | Crop Production Services, Perham | 218-346-2355 | C |
| Pipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | C |
| Polk | Brule, David A., Crookston | 218-281-2944 | C |
| Polk | Clementson, Jon, Erskine | 218-687-2345 | C |
| Polk | Gullekson, Ray, Brent & Brian, Beltrami | 218-926-5642 | C |
| Polk | Larson Farms, Inc., Ralph, E. Grand Forks | 218-773-1463 | R |
| Polk | Mat - Co., Inc., Fosston | 218-435-6667 | C R |
| Polk | Thorson Farm, Inc., J. O., E. Grand Forks | 218-893-2285 | C |
| Polk | Thorson, Osmund and Chad, E., Grand Forks | 218-893-2285 | C |
| Roseau | Cenex Harvest States Salol Elevator (Greenbush), Greenbush | 218-782-2111 | C |
| Roseau | Habstritt Farms, Inc., Roseau | 218-463-1193 | C |
| Roseau | Kilen, Jered, Greenbush | 218-782-2883 | C |
| Stearns | Jokeland Farms, Joel & Kathy Ebnet, Holdingford | 320-746-2147 | C |
| Stearns | Middendorf Seed Farm, Sauk Centre | 320-352-6053 | C |
| Stearns | Nietfeld Farm, Inc., Melrose | 320-987-3442 | C |
| Todd | Brekke, Floyd, Eagle Bend | 218-738-2672 | C |
| Todd | Faust, Kevin, Long Prairie | 320-732-3361 | C |
| Todd | Sweeney, Paul D., Bertha | 218-924-2921 | C |
| Wilkin | Haugrud Seed Plant, Rothsay | 218-493-4275 | C R |
| Wilkin | Knapp Seed Farm, Inc., Foxhome | 218-739-3366 | C R |

Royal

| | | | |
|----------|---|--------------|-----|
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| Houston | Troendle Farms, Spring Grove | 507-724-2211 | C |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |
| Wabasha | Zabel Seeds, Plainview | 507-534-2487 | C R |

Stander

| | | | |
|------------|--|--------------|-----|
| Douglas | Sward Seed Farm, Nelson | 320-762-0143 | C |
| Goodhue | Buck, Dou, Zumbrota | 507-732-5186 | C |
| Kandiyohi | Behn Seed Company, Atwater | 320-974-3003 | C |
| Kittson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | C R |
| Marshall | Jensen Farms, Stephen | 218-478-3398 | R |
| Meeker | Wigen Seed Farm, Litchfield | 320-693-8182 | C |
| Pennington | Scholin Farms, Thief River Falls | 218-964-5268 | C |
| Pipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | C R |
| Wright | Hopkins, Joseph, Buffalo | 763-682-1868 | C |

BEANS

Arthur Navy

| | | | |
|-------|-------------------------------|--------------|---|
| Grant | Kaprhahn, John M., Elbow Lake | 218-685-4604 | R |
|-------|-------------------------------|--------------|---|

BIG BLUESTEM

Bison

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

BIRDSFOOT TREFOIL

Norcen

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

CANADA WILD RYE

Mandan

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

CANOLA

Q2

| | | | |
|--------------|---|--------------|---|
| Out of State | Interstate Payco Seed Co., West Fargo, N.D. | 701-282-7338 | C |
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CORN

E500 Hybrid

| | | | |
|----------|-------------------------------|--------------|---|
| Renville | Enestvedt Bros., Sacred Heart | 320-765-2728 | C |
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E570 Hybrid

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

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

E605 Hybrid

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

E606 Hybrid

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

E670A Hybrid

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

E670Abi Hybrid

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

E690 Hybrid

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

DURUM WHEAT

Lebsock

| | | | |
|----------|------------------------------|--------------|---|
| Marshall | Sczepsanski, Thomas, Stephen | 218-478-2462 | R |
|----------|------------------------------|--------------|---|

Mountrail

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

Plaza

| | | | |
|----------|------------------------------|--------------|---|
| Marshall | Sczepsanski, Thomas, Stephen | 218-478-2462 | R |
|----------|------------------------------|--------------|---|

FIELD PEAS

Carnival

| | | | |
|-----------|--------------------------------------|--------------|---|
| Pipestone | Skyline Production System, Woodstock | 507-777-4262 | C |
|-----------|--------------------------------------|--------------|---|

FLAX

Omega

| | | | |
|--------|----------------------------------|--------------|---|
| Roseau | K & L Farms (Kraig Lee), Wamauka | 218-425-7739 | C |
|--------|----------------------------------|--------------|---|

Pembina

| | | | |
|----------|---------------------------------|--------------|-----|
| Kittson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | C R |
| Marshall | MacGregor, Clifford, Warren | 218-745-5753 | C |

INDIANGRASS

Towhatchawak

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

KENTUCKY BLUEGRASS

Minnifine

| | | | |
|--------|-------------------------------|--------------|---|
| Roseau | Habstritt Farms, Inc., Roseau | 218-463-1193 | C |
| Roseau | Marvin's, Warroad | 218-386-1333 | C |

Park

| | | | |
|---------------|---------------------------------------|--------------|-----|
| Lake of Woods | Pieper Farms, Jerry, Williams | 218-783-6610 | C |
| Lake of Woods | Pieper, Robert, Williams | 218-783-4352 | C |
| Roseau | Eastman, Bob, Roseau | 218-463-2873 | C |
| Roseau | Eastwood Estates/R&G Trucking, Roseau | 218-424-7509 | C |
| Roseau | Evergreen Farms, Inc., Roseau | 218-425-7432 | C |
| Roseau | Grahn, Greg R., Warroad | 218-463-3570 | C |
| Roseau | Habstritt Farms, Inc., Roseau | 218-463-1193 | C R |
| Roseau | Hagen, L & L Farms, Inc., Badger | 218-528-3523 | C |
| Roseau | Johnson Seed Farms, Inc., Salol | 218-424-7269 | C |
| Roseau | Johnson, Steve, Roseau | 218-424-7070 | C |
| Roseau | Lund, Ludvig, Roseau | 218-463-1029 | C |
| Roseau | Magnusson Farms, Roseau | 218-463-2374 | C |
| Roseau | Magnusson, Ardehl, 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 | 218-463-1179 | C R |
| Roseau | Olafson, Mark, Roseau | 218-463-3958 | C |
| Roseau | Santl Farms, 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

| | | | |
|------------|---------------------------------------|--------------|---|
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C |
| Kandiyohi | Behm Seed Company, Atwater | 320-974-3003 | C |
| Le Sueur | Stangler Farm Seed, Dick, Kilkenny | 507-595-2883 | C |
| Lincoln | Lincoln County Feed & Seed, Ivanhoe | 507-694-1243 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | C |
| Otter Tail | Peeters, John, Menahga | 218-385-2609 | C |
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | C |

Dane

| | | | |
|-----------|---|--------------|---|
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| Goodhue | Tri, Robert R., Zumbrota | 507-732-7153 | C |
| Houston | Troendle Farms, Spring Grove | 507-724-2211 | C |
| Kandiyohi | Loge, Alan, Willmar | 320-235-4178 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |
| Meeker | Wigen Seed Farm, Litchfield | 320-693-8182 | C |
| Redwood | Sawwell's 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

| | | | |
|------|-----------------------|--------------|---|
| Clay | Tobolt Seed, Moorhead | 218-287-2904 | R |
|------|-----------------------|--------------|---|

Gem

| | | | |
|-----------|---|--------------|---|
| Brown | Cumingham Seed Farms, Sleepy Eye | 507-794-7323 | 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 |
| Lyon | Tbolen Seeds, Tracy | 507-629-3505 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |
| Meeker | Wigen Seed Farm, Litchfield | 320-693-8182 | C |
| Mower | Corning Seed & Supply Inc., Austin | 507-433-9002 | C |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | C |
| Olmsted | Meyer's Seeds, Inc., Elgin | 507-876-2482 | C |
| Redwood | Sawwell's Seed, Inc., Clements | 507-692-2240 | C |
| Renville | Kiecker, Greg, Hector | 507-426-8167 | C |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |
| Stearns | Krippner, Joe, Richmond | 320-597-4442 | C |
| Stearns | Nietfeld Farm, Inc., Melrose | 320-987-5442 | C |

| | | | |
|---------|---------------------------------|--------------|---|
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | C |
| Todd | Perish Farms, Inc., Browerville | 320-594-6586 | C |
| Todd | Schwanke, Lloyd, Grey Eagle | 320-285-5417 | C |
| Wabasha | Dill Company, LLC, Wabasha | 651-565-2611 | C |
| Wabasha | Zabel Seeds, Plainview | 507-534-2487 | C |

Jerry

| | | | |
|------------|---|--------------|-----|
| Blue Earth | Ramy Seed Co., Michael Ramy, Mankato | 507-387-4091 | C |
| Brown | Rosbach Lakeside Seeds, Inc., Hanska | 507-794-7698 | C |
| Clay | Rehder, Paul, Moorhead | 218-585-4389 | C |
| Clearwater | Holm, DuWayne, Shevlin | 218-785-2786 | C |
| Cottonwood | Bondhus, Barry N., Storden | 507-445-3226 | C R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| Goodhue | Tri, Robert R., Zumbrota | 507-732-7153 | C |
| Le Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C |
| Lyon | Blomme, Bill, Marshall | 507-532-6092 | C |
| Marshall | Newfolden Co-op Elevator Assn., Newfolden | 218-874-7465 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |
| Mower | Corning Seed & Supply Inc., Austin | 507-433-9002 | C |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | C |
| Mower | Ruhter, Elmer & David, Austin | 507-567-2242 | C |
| Nobles | Double A Farms, Bigelow | 507-372-7630 | C |
| Norman | Kurpius, Roger J., Gary | 218-356-8280 | C |
| Otter Tail | Crop Production Services, Perham | 218-346-2355 | C |
| Pennington | Scholin Farms, Thief River Falls | 218-964-5268 | C |
| Pine | Cabak, Daniel C., Hinckley | 320-384-7377 | C |
| Pipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | C |
| Polk | Capistran Seed Company, Crookston | 218-281-7840 | C |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C |
| Redwood | Sawwell's Seed, Inc., Clements | 507-692-2240 | C |
| Rice | Salaba, Larry, Faribault | 507-334-2603 | C |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |
| Stearns | Middendorf Seed Farm, Sauk Centre | 320-352-6053 | C |
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | C R |
| Wabasha | Dill Company, LLC, Wabasha | 651-565-2611 | C |
| Washington | Bowens, Thomas, Hugo | 612-640-8338 | C |
| Wright | Terning Seeds, Inc., Cokato | 320-286-2168 | C |

Jim

| | | | |
|------------|---------------------------------------|--------------|---|
| Blue Earth | Ramy Seed Co., Michael Ramy, Mankato | 507-387-4091 | C |
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C |
| Le Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |
| Wabasha | Dill Company, LLC, Wabasha | 651-565-2611 | C |

Loyal

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

Milton

| | | | |
|------------|---------------------------------------|--------------|-----|
| Lyon | Olson, Jonathan, Cottonwood | 507-423-6340 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |
| Norman | Chisholm, Mark M., Gary | 218-356-8507 | C |
| Norman | Malm, Cecil, Shelly | 218-886-8488 | R |
| Otter Tail | Crop Production Services, Perham | 218-346-2355 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |
| Stearns | Krippner, Joe, Richmond | 320-597-4442 | C |
| Todd | Schwanke, Lloyd, Grey Eagle | 320-285-5417 | C R |

Ogle

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|-----------|---------------------------------|--------------|---|
| Faribault | Watsonwan Farm Service, Koester | 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 |
| Stearns | Middendorf Seed Farm, Sauk Centre | 320-352-6053 | C |
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | C |

Richard

| | | | |
|---------|-------------------------------|--------------|---|
| Dakota | Moy, Jr., William, Farmington | 952-463-8541 | C |
| Douglas | Sward Seed Farm, Nelson | 320-762-0143 | R |

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|------------|---|--------------|-----|
| Douglas | Thompson Farms, Kensington | 320-965-2486 | R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Goodhue | Tri, Robert R., Zumbrota | 507-732-7153 | R |
| Kandiyohi | Loge, Alan, Willmar | 320-235-4178 | R |
| Le Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | R |
| Le Sueur | Stangler Farm Seed, Dick, Kilkenny | 507-595-2883 | R |
| Lincoln | Lincoln County Feed & Seed, Ivanhoe | 507-694-1243 | R |
| Lyon | Huso, Elroy & Howard, Ghent | 507-872-6821 | R |
| Lyon | Olson, Jonathan, Cottonwood | 507-423-6340 | R |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | R |
| Meeker | Smith, Steven, Darwin | 320-693-6769 | R |
| Meeker | Wigen Seed Farm, Litchfield | 320-693-8182 | R |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | R |
| Mower | Zimmerman Seeds, Racine | 507-378-2077 | R |
| Nicollet | Anderson & Sons, St. Peter | 507-246-5032 | R |
| Norman | Chisholm, Mark M., Gary | 218-356-8507 | R |
| Olmsted | Meyer's Seeds, Inc., Elgin | 507-876-2482 | R |
| Otter Tail | Dittmann, Lyle E., New York Mills | 218-385-2392 | R |
| Otter Tail | Huwe, Janice, New York Mills | 218-385-3865 | R |
| Pine | Cabak, Daniel C., Hinckley | 320-384-7377 | R |
| Pipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | R |
| Renville | JSF, Inc. (Johnson Seed Farm), Sacred Heart | 320-765-2225 | R |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | R |
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | R |
| Swift | Nelson Seed Company, Benson | 320-843-3610 | R |

Riser

| | | | |
|------------|---|--------------|-----|
| Blue Earth | Ramy Seed Co., Michael Ramy, Mankato | 507-387-4091 | C |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Goodhue | Stenlund, Arne H. & Son, Goodhue | 651-923-4107 | C |
| Le Sueur | Stangler Farm Seed, Dick, Kilkenny | 507-595-2883 | C R |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | C |
| Mower | Zimmerman Seeds, Racine | 507-378-2077 | C |
| Renville | Kiecker, Greg, Hector | 507-426-8167 | R |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |
| 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, Wabasha | 651-565-2611 | C |
| Wabasha | Zabel Seeds, Plainview | 507-534-2487 | C |

Troy

| | | | |
|------------|---|--------------|-----|
| Marshall | Newfölden Co-op Elevator Assn., Newfölden | 218-874-7465 | C |
| Otter Tail | Crop Production Services, Perham | 218-346-2355 | C |
| Otter Tail | Miller, Donald, Henning | 218-583-2451 | C R |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |
| Todd | Schwanzke, Lloyd, Grey Eagle | 320-285-5417 | C R |

Vista

| | | | |
|------------|---|--------------|---|
| Dakota | May, Jr., William, Farmington | 952-463-8541 | C |
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | 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 | Smith, Steven, Darwin | 320-693-6769 | C |
| Mower | Zimmerman Seeds, Racine | 507-378-2077 | C |
| Olmsted | Meyer's Seeds, Inc., Elgin | 507-876-2482 | C |
| Otter Tail | Peeters, John, Menahga | 218-385-2609 | C |
| Pipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | C |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |
| Wabasha | Dill Company, LLC, Wabasha | 651-565-2611 | C |
| Wabasha | Zabel Seeds, Plainview | 507-534-2487 | C |
| Washington | Wetlander, Arthur, Stillwater | 651-439-2598 | C |

PERENNIAL RYEGRASS

Gator II

| | | | |
|---------------|-----------------------------|--------------|---|
| Lake of Woods | Hefustetter Farm, Roosevelt | 218-442-7285 | C |
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PR 8820

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| Lake of Woods | Tveit Farms, Roosevelt | 218-442-5281 | C |
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RED CLOVER

Marathon

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

RYE

Rymin

| | | | |
|----------|---|--------------|-----|
| Brown | Goblirsch, Glen, Springfield | 507-723-6559 | C |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| Meeker | Wigen, Marlow E., Litchfield | 320-693-8182 | C R |

SOYBEANS

Agassiz

| | | | |
|------|------------------------------------|--------------|-----|
| Polk | Clementson, Jon, Erskine | 218-687-2345 | C R |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C |
| Polk | Larson Farms, Jerry Larson, Climax | 218-857-3345 | C |

Barnes

| | | | |
|----------|--|--------------|---|
| Clay | Anderson, Lynn, Moorhead | 218-287-1765 | R |
| Douglas | Sward Seed Farm, Nelson | 320-762-0143 | R |
| Marshall | Baird Farms, Inc., Warren | 218-745-5330 | R |
| Marshall | Peterson Farms of Warren, Inc., D.L., Warren | 218-745-4077 | R |

Bert

| | | | |
|---------------|-------------------------------|--------------|-----|
| Lac qui Parle | Harwick, Kenneth, Madison | 320-752-4455 | C |
| Renville | Enestvedt Bros., Sacred Heart | 320-765-2728 | C R |

Corona

| | | | |
|----------|--------------------------------------|--------------|---|
| Kitson | Johnson Farms, Inc., Lloyd, Karlstad | 218-436-2817 | C |
| Marshall | Jensen Seed Company, Stephen | 218-478-3397 | C |

Corsoy 79

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

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| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| Polk | Ostenaar, Sidney & DeWayne, Mc Intosh | 218-563-7395 | R |
| Wilkin | Haugrud Seed Plant, Rothsay | 218-493-4275 | C R |

Daksoy

| | | | |
|----------|--------------------------------------|--------------|---|
| Marshall | Efta, Joe, Argyle | 218-437-6457 | C |
| Marshall | Kowalski, James, Stephen | 218-478-3899 | C |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | R |
| Norman | Chisholm, Mark M., Gary | 218-356-8507 | C |
| Polk | Kovar, Frank & Duane, E. Grand Forks | 218-773-9238 | C |
| Polk | Peterson, D. W., Inc., Warren | 218-745-4507 | R |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C |
| Roseau | Slatet, Gary, Roseau | 218-463-1064 | R |

Evans

| | | | |
|--------|---------------------------------------|--------------|---|
| Becker | Hein Farms, Inc., Audubon | 218-439-6621 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |

Freeborn

| | | | |
|-----------|---|--------------|-----|
| Faribault | Ehrich Seed Farm, Elmore | 507-943-3762 | C |
| Faribault | Watowwan Farm Service, Kiester | 507-294-3697 | C |
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | R |

Glacier

| | | | |
|----------|-------------------------------|--------------|---|
| Marshall | Backstrom Farms, Inc., Warren | 218-745-5113 | C |
|----------|-------------------------------|--------------|---|

Granite

| | | | |
|---------|-------------------------|--------------|---|
| Lincoln | Popowski, John, Ivanhoe | 507-694-3593 | C |
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HP204

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|--------------|---|--------------|-----|
| Dodge | Frontier Commodities, Byron | 507-775-2174 | R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | C |
| Out of State | Patison Bros, Inc., Fayette, Iowa | 319-425-3365 | R |
| Wright | Dahlco Seeds, Inc., Colkato | 320-286-5982 | C |

Hardin 91

| | | | |
|--------------|---|--------------|-----|
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Meeker | Miller Seed Farm, Dassel | 320-275-2463 | C |
| Meeker | Smith, Steven, Darwin | 320-693-6769 | C |
| Out of state | Wash. Department Of Agriculture, Yakima | 509-575-2750 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |

IA1006

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|-----------|---|--------------|-----|
| Dodge | Koss, William, Dodge Center | 507-374-6786 | R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Freeborn | Kuiters, Keith S., Clarks Grove | 507-256-4300 | C |
| Jackson | Brunk Bros., Gene or William, Brewster | 507-842-5471 | C |
| Kandiyohi | Loge, Alan, Willmar | 320-235-4178 | C |
| Le Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C R |
| Lincoln | Jerzak, John, Ivanhoe | 507-694-1834 | C |
| Meeker | Anderson Seeds, Dassel | 320-286-2700 | C |
| Meeker | Miller Seed Farm, Dassel | 320-275-2463 | C R |
| Mower | Zimmerman Seeds, Racine | 507-378-2077 | C |
| Nicollet | Anderson & Sons, St. Peter | 507-246-5032 | C |
| Pipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | C |
| Redwood | Lange, Robert A., Windom | 507-831-4065 | C |
| Renville | Enestvedt Bros., Sacred Heart | 320-765-2728 | C R |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |

IA1007

| | | | |
|----------|---|--------------|-----|
| Dodge | Frontier Commodities, Byron | 507-775-2174 | R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |

IA1008

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|-----------|-----------------------------------|--------------|---|
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |

IA2008

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|----------|---|--------------|---|
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
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IA2008R

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|-----------|--------------------------------------|--------------|-----|
| Brown | Rosbach Lakeside Seeds, Inc., Hanska | 507-794-7698 | C |
| Faribault | Watowan Farm Service, Kiester | 507-294-3697 | C |
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C R |
| Le Sueur | Birr Brothers, Mark & Gene, Kasota | 507-931-2218 | C R |
| Mower | Zimmerman Seeds, Racine | 507-378-2077 | C |
| Renville | Enestvedt Bros., Sacred Heart | 320-765-2728 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |

IA2012

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|----------|---|--------------|---|
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
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IA2016

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|------------|---|--------------|---|
| Cottonwood | Bondhus, Barry N., Storden | 507-445-3226 | C |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |

IA2020

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|-------|-----------------------------|--------------|---|
| Dodge | Frontier Commodities, Byron | 507-775-2174 | R |
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IA2021

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|------------|---|--------------|-----|
| Brown | Rosbach Lakeside Seeds, Inc., Hanska | 507-794-7698 | C |
| Cottonwood | Bondhus, Barry N., Storden | 507-445-3226 | C R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Jackson | Pietz Farms, Inc. & Curtis Pietz, Lakefield | 507-662-6309 | C |
| Le Sueur | Goettl Farms % R & J Goettl, Le Center | 507-357-6509 | C R |
| Le Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C R |
| Lyon | Olson, Jonathan, Cottonwood | 507-423-6340 | C R |
| Nicollet | Anderson & Sons, St. Peter | 507-246-5032 | C |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |

IA2036

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|-----------|-----------------------------------|--------------|---|
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C |
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IA2041

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| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | R |
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IA2050

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| Lac qui Parle | Hermanson Seed Plant, Boyd | 320-855-2582 | R |
| Wabasha | Zabel Seeds, Plainview | 507-534-2487 | R |

Jim

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| Becker | Hein Farms, Inc., Audubon | 218-439-6621 | C |
| Carlton | Korhonen, Art, Kettle River | 218-273-4931 | C |
| Clay | Heartland Seeds, Moorhead | 218-585-4621 | C |
| Kittson | Johnson Farms, Inc., Lloyd, Karlstad | 218-436-2817 | C |
| Kittson | Petersen, Ronald L., Lake Bronson | 218-754-4631 | C |
| Kittson | Wiese, Inc., James C., Humboldt | 218-379-3257 | C |
| Marshall | Anderson, Brian C., Stephen | 218-455-3495 | C |
| Marshall | Backstrom Farms, Inc., Warren | 218-745-5113 | C |
| Marshall | Efta, Joe, Argyle | 218-437-6457 | C |
| Marshall | Farmers Elevator Company, Alvarado | 218-965-4812 | C |
| Marshall | Kowalski, James, Stephen | 218-478-3899 | C R |
| Marshall | Peterson Farms of Warren, Inc., D.L., Warren | 218-745-4077 | R |
| Marshall | Peterson, Maynard, Stephen | 218-478-3859 | C R |
| Marshall | Pietruszewski, Alan, Stephen | 218-478-2431 | C |
| Marshall | Riopelle, Earl & Brent, Argyle | 218-437-8291 | C |
| Marshall | Riopelle, Jack L., Argyle | 218-437-8147 | R |
| Marshall | Widner, Neil, Stephen | 218-478-3616 | C |
| Norman | Chisholm, Michael, Gary | 218-356-8507 | C |
| Out of state | Anderson, Gerald D., Grand Forks | 701-775-8766 | C R |
| Pennington | Scholin Farms, Thief River Falls | 218-964-5268 | C |
| Pennington | Swanson, Curtis W., Thief River Falls | 218-964-5619 | C |
| Polk | Anderson Tronnes Farms, Inc., Climax | 218-857-3326 | C |
| Polk | Balstad, Scott, Fosston | 218-435-6311 | C |
| Polk | Bauer Farms, Erskine | 218-687-5356 | C |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C R |
| Polk | Gullekson, Ray, Brent & Brian, Beltrami | 218-926-5642 | C |
| Polk | Johnstad, David, Beltrami | 218-926-5663 | R |
| Polk | Kovar, Frank & Duane, E. Grand Forks | 218-773-9238 | C |
| Polk | Mat - Co., Inc., Fosston | 218-435-6667 | C R |
| Polk | Novak, James, Angus | 218-745-5048 | C |
| Polk | Ostenaar, Sidney & DeWayne, Mc Intosh | 218-563-7395 | C |
| Polk | Peterson, D.W., Inc., Warren | 218-745-4507 | C |
| Polk | Vig Farms Inc., Fosston | 218-435-1316 | C |
| Red Lake | Myhre Farms, Red Lake Falls | 218-698-4485 | C |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C R |

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|----------|----------------------------|--------------|-----|
| Meeker | Thissen, Ben, Litchfield | 320-693-7382 | C |
| Renville | Wertish, Thomas R., Hector | 320-848-2453 | R |
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | C R |
| Swift | Lee's Seed Farm, Benson | 320-843-2857 | R |

Lambert

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|-----------|---|--------------|-----|
| Douglas | Sward Seed Farm, Nelson | 320-762-0143 | C |
| Douglas | Thompson Farms, Kensington | 320-965-2486 | C R |
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| Grant | Adams Seed, Wendell | 218-458-2151 | C |
| Le Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C R |
| 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 | C R |
| Todd | Faust, Kevin, Long Prairie | 320-732-3361 | C |
| Wilkin | Steenblock Farms, Dale, Campbell | 218-630-5500 | C |

MN0301

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|----------|-------------------------------|--------------|---|
| Clay | Fuglie, Duane, Ulen | 218-596-8528 | C |
| Clay | Hastings, Joseph, Felton | 218-494-3935 | C |
| Clay | Lee Seed Farm, Borup | 218-494-3330 | C |
| Clay | Tobolt Seed, Moorhead | 218-287-2904 | C |
| Clay | Tri-County Co-op Assn., Ulen | 218-596-8821 | C |
| Clay | Zimmerman, Wayne, Ulen | 218-596-8628 | C |
| Mahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | C |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | C |
| Wilkin | Haugrud Seed Plant, Rothsay | 218-493-4275 | C |

MN0901

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|----------|--------------------------|--------------|-----|
| Le Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C R |
| Renville | Kiecker, Greg, Hector | 507-426-8167 | R |

IN0902CN

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|-----------|-------------------------------------|--------------|---|
| rown | Cunningham Seed Farms, Sleepy Eye | 507-794-7323 | R |
| ille Lacs | Schimming, Mike & Walter, Princeton | 763-389-2679 | R |
| enville | Fredrickson, Lester, Hector | 320-848-2601 | R |

IN1301

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|----------|--|--------------|---|
| ig Stone | Clinton Ag Service, Inc., Clinton | 320-325-5203 | C |
| ouglas | Sward Seed Farm, Nelson | 320-762-0143 | C |
| rant | Jennen, Richard J. II & Family, Elbow Lake | 218-685-4903 | C |
| leeker | Thissen, Ben, Litchfield | 320-693-7382 | C |
| enville | Kiecker, Greg, Hector | 507-426-8167 | C |
| wift | Falk Seed Farm, Murdock | 320-875-4341 | C |

IN1401

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| andiyohi | Loge, Alan, Willmar | 320-235-4178 | C |
| e Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C R |
| leeker | Thissen, Ben, Litchfield | 320-693-7382 | C |
| enville | Kiecker, Greg, Hector | 507-426-8167 | C R |
| ott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |

IN1801

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|--------------|---|--------------|-----|
| ottonwood | Bondhus, Barry N., Storden | 507-445-3226 | R |
| odge | Koss, William, Dodge Center | 507-374-6786 | R |
| eeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| andiyohi | Loge, Alan, Willmar | 320-235-4178 | C |
| ac qui Parle | Buer's Seeds, Canby | 507-223-5100 | C R |
| ac qui Parle | Hermanson Seed Plant, Boyd | 320-855-2582 | C |
| ac qui Parle | Kemen, Robert & Sons, Madison | 320-769-4413 | C R |
| e Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C R |
| leeker | Anderson Seeds, Dassel | 320-286-2700 | C |
| leeker | Thissen, Ben, Litchfield | 320-693-7382 | C |
| icollet | Anderson & Sons, St. Peter | 507-246-5032 | C |
| ipestone | Spronk, Art & Sons Seed Farm, Edgerton | 507-442-5334 | R |
| enville | Kiecker, Greg, Hector | 507-426-8167 | C R |
| ice | Werner Farm Seeds, Dundas | 507-645-7995 | C R |
| ott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |
| ellow Med. | Rosetter, Richard D., Granite Falls | 320-564-3620 | R |

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| ilkin | Friederichs Farm, Foxhome | 218-643-2363 | C |
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| lay | Petermann Seeds, Inc., Hawley | 218-483-3302 | C |
| ahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | C |

IAC Atwood

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| arshall | Robertson Brothers, Argyle | 218-437-6411 | C |
| olk | Peterson, D W., Inc., Warren | 218-745-4507 | C |

IAC Millennium

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|-------------|---------------------------------------|--------------|---|
| ut of state | Anderson, Gerald D, Grand Forks, N.D. | 701-775-8766 | C |
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arker

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| icoln | Jerzak, John, Ivanhoe | 507-694-1834 | C |
| icoln | Popowski, John, Ivanhoe | 507-694-1593 | C |

iturdy

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|--------------|---|--------------|-----|
| rown | Rosbach Lakeside Seeds, Inc., Hanska | 507-794-7698 | C |
| eeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| ac qui Parle | Buer's Seeds, Canby | 507-223-5100 | C R |
| ac qui Parle | Hermanson Seed Plant, Boyd | 320-855-2582 | C |
| e Sueur | Birr Brothers, Mark & Gene, Kasota | 507-931-2218 | C R |
| e Sueur | Haas Seed Farm, Le Sueur | 507-665-3683 | C |
| enville | Kiecker, Greg, Hector | 507-426-8167 | C R |

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|--------------|---|--------------|-----|
| lay | Heartland Seeds, Moorhead | 218-585-4621 | C |
| ouglas | Sward Seed Farm, Nelson | 320-762-0143 | C |
| eeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| rant | Adams Seed, Wendell | 218-458-2151 | C |
| andiyohi | Loge, Alan, Willmar | 320-235-4178 | C |
| ac qui Parle | Hermanson Seed Plant, Boyd | 320-855-2582 | C |
| ac qui Parle | Kemen, Robert & Sons, Madison | 320-769-4413 | C R |

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|----------|-------------------------------|--------------|-----|
| Lincoln | Deutz, Daniel, Lake Benton | 507-368-9234 | C R |
| Meeker | Thissen, Ben, Litchfield | 320-693-7382 | C |
| Renville | Enestvedt Bros., Sacred Heart | 320-765-2728 | C |
| Renville | Enestvedt Bros., Sacred Heart | 320-765-2728 | R |
| Rice | Werner Farm Seeds, Dundas | 507-645-7995 | C |
| Swift | Nelson Seed Company, Benson | 320-843-3610 | C |
| Traverse | Rinke, David, Wheaton | 320-563-4864 | R |

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

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| Clay | Olggaard, Inc., Harold, Moorhead | 218-585-4535 | C |
| Clay | Peterson Farm, Sherwood E, Sabin | 218-789-7378 | C |
| Clay | Wetterlin, Jerry & Aaron, Glyndon | 218-494-3339 | C |
| Clay | Zimmerman, Wayne, Ulen | 218-596-8628 | C R |
| Mahnomen | Haugo, David, Waubun | 218-473-2254 | C R |
| Mahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | C |
| Marshall | Anderson, Travis, Argyle | 218-437-8107 | C |
| Marshall | Backstrom Farms, Inc., Warren | 218-745-5113 | C |
| Marshall | Efta, Joe, Argyle | 218-437-6457 | C |
| Marshall | Farmers Elevator Company, Alvarado | 218-965-4812 | C |
| Marshall | Hammerlund Farms, Oslo | 218-695-3481 | C |
| Marshall | Osowski, Joel, Oslo | 218-695-0917 | C |
| Marshall | Peterson, Maynard, Stephen | 218-478-3859 | C R |
| Marshall | Pietruszewski, Alan, Stephen | 218-478-2431 | C |
| Norman | Ramstad Brothers, Ada | 218-784-7190 | C |
| Out of state | Anderson, Gerald D, Grand Forks, N.D. | 701-775-8766 | C R |
| Out of state | Wash. Department Of Agriculture, Yakima | 509-575-2750 | R |
| Pennington | Swanson, Curtis W., Thief River Falls | 218-964-5619 | C |
| Polk | Balstad, Scott, Fosston | 218-435-6311 | C |
| Polk | Bauer Farms, Erskine | 218-687-3336 | C |
| Polk | Dvorak, Ted, Warren | 218-745-5636 | R |
| Polk | Kovar, Frank & Duane, E. Grand Forks | 218-773-9238 | C |
| Polk | Larson Farms, Inc., Owen, Clifton | 701-775-3546 | C |
| Polk | Mid-Valley Grain Cooperative, Crookston | 218-281-2881 | C |
| Polk | Nelson, Jon W., Oslo | 218-695-3691 | C |
| Polk | Ostenaar, Sidney & DeWayne, Mc Intosh | 218-563-7395 | C R |
| Polk | Peterson, Douglas, E. Grand Forks | 218-773-9120 | C |
| Polk | Ross Seed Co., Fisher | 218-891-2211 | C |
| Polk | Sonstelic, Gordon & Gary, Winger | 218-938-4189 | C |
| Polk | Vig Farms Inc., Fosston | 218-435-1316 | C R |
| Red Lake | Nymann Farms, Erik, Nymann, Plummer | 218-465-4423 | C |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C R |

Turner

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|-------------|---|--------------|-----|
| Brown | Cunningham Seed Farms, Sleepy Eye | 507-794-7323 | R |
| Brown | Rosbach Lakeside Seeds, Inc., Hanska | 507-794-7698 | C |
| Dodge | Koss, William, Dodge Center | 507-374-6786 | R |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Jackson | Brunk Bros., Gene or William, Brewster | 507-842-5471 | C |
| Redwood | Lange, Robert A., Windom | 507-831-4065 | C |
| Yellow Med. | Rosetter, Richard D., Granite Falls | 320-564-3620 | R |

Vinton 81

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|------------|---|--------------|-----|
| Blue Earth | Ramy Seed Co., Michael Ramy, Mankato | 507-387-4093 | C R |
| Cottonwood | Bondhus, Barry N., Storden | 507-445-3226 | C |
| Cottonwood | Imker, Brent, Lamberton | 507-752-7697 | C |
| Faribault | Willette Seed Farm, Inc., Delavan | 507-854-3595 | C R |
| Fillmore | Moe'ler, Virgil, Spring Valley | 507-346-2057 | C |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Mower | Grass & Sons Seed Service, Le Roy | 507-324-5820 | C |
| Steele | SunRich, Hope | 507-451-3316 | R |

TIMOTHY

Clair

| | | | |
|----------|----------------------------------|--------------|-----|
| Marshall | Klamar Farms, Gatzke | 218-459-3380 | C R |
| Roseau | Marvik's, Warrroad | 218-286-1333 | C |
| Roseau | McFarlane Seeds, Inc., Greenbush | 218-782-2700 | C R |

Climax

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|---------------|----------------------------------|--------------|---|
| Lake of Woods | Pieper, Robert, Williams | 218-783-4352 | C |
| Roseau | McFarlane Seeds, Inc., Greenbush | 218-782-2700 | C |
| Roseau | Vatnsdal, David, Roseau | 218-463-3239 | C |

WHEAT

2375

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|---------------|---|--------------|---|
| Clay | Thompson, Richard, Barnesville | 218-789-7208 | C |
| Grant | Red River Marketing Co., Elbow Lake | 218-685-6100 | C |
| Lac qui Parle | Kemen, Robert & Sons, Madison | 320-769-4413 | C |
| Lincoln | Jerzak, John, Ivanhoe | 507-694-1834 | C |
| Lincoln | Popowski, John, Ivanhoe | 507-694-1593 | C |
| Lyon | Olson, Jonathan, Cottonwood | 507-423-6340 | C |
| Marshall | Farmers Elevator Company, Alvarado | 218-965-4812 | C |
| Marshall | Green, Carl M., Strandquist | 218-597-2861 | C |
| Norman | Malme, Cecil, Shelly | 218-886-8488 | C |
| Polk | Barrett, John M., E. Grand Forks | 218-773-0338 | C |
| Polk | Gullekson, Ray, Brent & Brian, Beltrami | 218-926-5642 | C |
| Renville | Kiecker, Greg, Hector | 507-426-8167 | C |
| Roseau | Cenex Harvest States Saiol Elevator (Greenbush), Greenbush | 218-782-2111 | C |
| Roseau | Kukowski, Jim, Strathcona | 218-781-2478 | C |
| Roseau | Magnusson Farms, Roseau | 218-463-2374 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |
| Wright | Dahico Seeds, Inc., Cokato | 320-286-5982 | C |
| Wright | Hopkins, Joseph, Buffalo | 763-682-1868 | C |
| Wright | Terning Seeds, Inc., Cokato | 320-286-2168 | C |

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| Wright | Terning Seeds, Inc., Cokato | 320-286-2168 | C R |
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AC Barrie

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|--------|---------------------------------|--------------|-----|
| Kitson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | C R |
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Alsen

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|---------------|--|--------------|---|
| Clay | Lee Seed Farm, Borup | 218-494-3330 | R |
| Clay | Petermann Seeds, Inc., Hawley | 218-483-3302 | R |
| Clay | Tande, Harmen, Moorhead | 218-233-0250 | R |
| Clay | Tang, Gordon & Sons, Felton | 218-494-3643 | R |
| Clay | Toboit Seed, Moorhead | 218-287-2904 | R |
| Clay | Zimmerman, Wayne, Ulen | 218-596-8628 | R |
| Douglas | Sward Seed Farm, Nelson | 320-762-0143 | R |
| Grant | Adams Seed, Wendell | 218-458-2151 | R |
| Grant | Jennen, Richard J. II & Family, Elbow Lake | 218-685-4903 | R |
| Kitson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | R |
| Kitson | Carlson, James A., Hallock | 218-843-3483 | R |
| Kitson | Jensen, A. Gay Farms Co., Drayton | 701-454-6294 | R |
| Kitson | Johnson Farms, Inc., Lloyd, Karlstad | 218-436-2817 | R |
| Kitson | Olsonawski, Jerry, Hallock | 218-379-3235 | R |
| Kitson | Osowski, Terry, Hallock | 218-843-3371 | R |
| Kitson | Petersen, Ronald L., Lake Bronson | 218-754-4631 | R |
| Kitson | Rickenberg, Jeff, Kennedy | 218-674-4231 | R |
| Kitson | Sedensquist Farms, Inc., Kennedy | 218-674-4218 | R |
| Kitson | Sorenson, David, Hallock | 218-843-3436 | R |
| Kitson | Stewart, H. Shane, St. Vincent | 218-379-3282 | R |
| Lake of Woods | Bitter, Willis M., Williams | 218-783-6292 | R |
| Lake of Woods | Helmstetter Farm, Roosevelt | 218-442-7285 | R |
| Mahnomen | Haugo, David, Waubun | 218-473-2254 | R |
| Mahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | R |
| Marshall | Anderson, Harvey O. & Luther H., Stephen | 218-455-3305 | R |
| Marshall | Baird Farms, Inc., Warren | 218-745-5330 | R |
| Marshall | Gostanzak, Stan, Argyle | 218-437-8149 | R |
| Marshall | Holte, Steven, Grygla | 218-294-6537 | R |
| Marshall | Jensen Farms, Stephen | 218-478-3398 | R |
| Marshall | Kowalski, James, Stephen | 218-478-3899 | R |
| Marshall | Peterson Farms of Warren, Inc., D.L., Warren | 218-745-4077 | R |
| Marshall | Peterson, Maynard, Stephen | 218-478-3859 | R |
| Marshall | Riopelle, Earl & Brent, Argyle | 218-437-8291 | R |

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| Marshall | Riopelle, Jack L., Argyle | 218-437-8147 | R |
| Marshall | Rivard Farms, Inc., Argyle | 218-437-6479 | R |
| Marshall | Robertson Brothers, Argyle | 218-437-6411 | R |
| Marshall | Widner, Neil, Stephen | 218-478-3616 | R |
| Marshall | Yutzenka, Don and Mark, Argyle | 218-437-8428 | R |
| Norman | Bernhardson, Charles E., Shelly | 218-886-7335 | R |
| Norman | Brandt, Robert, Ada | 218-784-4093 | R |
| Norman | Brandt, Wayne G. & John, Ada | 218-784-4774 | R |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | R |
| Norman | Ellingson Farms, Borup | 218-861-6605 | R |
| Norman | Malme, Cecil, Shelly | 218-886-8488 | R |
| Pennington | Engelstad Farms of Rocksbury, Thf Rvr Falls | 218-681-1000 | R |
| Pennington | Scholin Farms, Thief River Falls | 218-964-5268 | R |
| Pennington | Swanson, Curtis W., Thief River Falls | 218-964-5619 | R |
| Polk | Balstad, Scott, Fosston | 218-435-6311 | R |
| Polk | Holy, Donald J., E. Grand Forks | 218-773-1468 | R |
| Polk | Larson, Ray H., Inc., Angus | 218-745-5923 | R |
| Polk | Mat - Co., Inc., Fosston | 218-435-6667 | R |
| Polk | Peterson, D.W., Inc., Warren | 218-745-4507 | R |
| Polk | Peterson, Douglas, E. Grand Forks | 218-773-9120 | R |
| Polk | Ross Seed Co., Fisher | 218-891-2211 | R |
| Polk | Thorson Farm, Inc., J. O., E. Grand Forks | 218-893-2285 | R |
| Polk | Tiedemann, Gene R., Euclid | 218-281-6723 | R |
| Polk | Wentzel, Walton Farms, Inc., Fisher | 218-281-2207 | R |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | R |
| Renville | JSE Inc. (Johnson Seed Farm), Sacred Heart | 320-765-2225 | R |
| Roseau | Habstritt Farms, Inc., Roseau | 218-463-1193 | R |
| Roseau | Kukowski, Jim, Strathcona | 218-781-2478 | R |
| Roseau | Magnusson Farms, Roseau | 218-463-2374 | R |
| Roseau | Marvin's, Warroad | 218-386-1333 | R |
| Roseau | Olafson, Mark, Roseau | 218-463-3958 | R |
| Traverse | Johnson, Robert, Wheaton | 320-563-4490 | R |
| Traverse | Raguse, William, Tintah | 320-563-4865 | R |
| Wilkin | Friederichs Farm, Foxhome | 218-643-2363 | R |
| Wilkin | Haugrud Seed Plant, Rothsay | 218-493-4275 | R |
| Wilkin | Knapp Seed Farm, Inc., Foxhome | 218-739-3366 | R |
| Wilkin | Kruse & Tischer Farms, Breckenridge | 218-643-1100 | R |
| Wilkin | Larson Farms/Eldon, Rothsay | 218-867-2674 | R |
| Wilkin | Torkelson, Dennis & Brent, Foxhome | 218-736-4697 | R |

Argent

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| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C |
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| Marshall | Elseth, Elden & Robert, Warren | 218-745-6515 | C |
| Marshall | Riopelle, Jack L., Argyle | 218-437-8147 | R |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | R |
| Polk | Barrett, Glenn R., Angus | 218-745-4782 | R |
| Polk | Pulkrabek, Anthony H., Angus | 218-745-5053 | C |

Dandy

| | | | |
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| Goodhue | NorthStar Genetics, Wanamingo | 507-824-2878 | C |
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Ember

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| Marshall | Jensen Farms, Stephen | 218-478-3398 | R |
| Marshall | Kowalski, James, Stephen | 218-478-3899 | R |
| Marshall | Riopelle, Jack L., Argyle | 218-437-8147 | R |
| Marshall | Robertson Brothers, Argyle | 218-437-6411 | R |
| Norman | Brandt, Robert Jr., Ada | 218-784-4093 | R |
| Otter Tail | Kelles, Clifford L., Fergus Falls | 218-736-4664 | C |
| Polk | Larson, Roger O., Euclid | 218-281-5697 | R |
| Polk | Peterson, D.W., Inc., Warren | 218-745-4507 | R |

Forge

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| Clay | Thompson, Richard, Barnesville | 218-789-7208 | C |
| Kandiyohi | Loge, Alan, Willmar | 320-235-4178 | C |
| Kitson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | C R |
| Kitson | Petersen, Ronald L., Lake Bronson | 218-754-4631 | C |
| Lake of Woods | Helmstetter Farm, Roosevelt | 218-442-7285 | C |
| Lake of Woods | Olson, Emil A., Roosevelt | 218-442-5465 | C |
| Marshall | Jensen Farms, Stephen | 218-478-3398 | C |

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|---------------|---|--------------|-----|---------------|--|--------------|-----|
| farshall | Nybladh, Alvin, Stephen | 218-478-3345 | C | Clay | Zimmerman, Wayne, Ulen | 218-596-8628 | C |
| farshall | Peterson, Maynard, Stephen | 218-478-3859 | C | Douglas | Sward Seed Farm, Nelson | 320-762-0143 | C |
| olk | Egeland, Inc., John M., Fisher | 218-893-2662 | C | Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| olk | Kovar, Frank & Duane, E. Grand Forks | 218-773-9238 | C | Grant | Adams Seed, Wendell | 218-458-2151 | C |
| olk | Ross Seed Co., Fisher | 218-891-2211 | C | Grant | Backman Seeds, Inc., Herman | 320-677-2231 | C R |
| ellow Med. | Rosetter, Richard D., Granite Falls | 320-564-3620 | R | Grant | Kapphahn, John M., Elbow Lake | 218-685-4604 | C R |
| runner | | | | Grant | Thiel Seed Service, Wendell | 218-458-2415 | C |
| lay | Lee Seed Farm, Borup | 218-494-3330 | C | Kandiyohi | Behm Seed Company, Atwater | 320-974-3003 | C R |
| ittson | Petersen, Ronald L., Lake Bronson | 218-754-4631 | C | Kitson | Carlson, James A., Hallock | 218-843-3483 | R |
| olk | Capistran Seed Company, Crookston | 218-281-7840 | C R | Kitson | Johnson Farms, Inc., Lloyd, Karlstad | 218-436-2817 | R |
| olk | Ross Seed Co., Fisher | 218-891-2211 | C R | Kitson | Minske, Lyndon, Hallock | 218-843-2723 | C |
| 1998 | | | | Kitson | Petersen, Ronald L., Lake Bronson | 218-754-4631 | C |
| lay | Benedict Farms, Inc., Sabin | 218-789-7326 | C | Lac qui Parle | Buer, Reid, Canby | 507-223-7946 | R |
| lay | Heartland Seeds, Moorhead | 218-585-4621 | C | Le Sueur | Sapp Farms % Robert Sapp, Le Center | 507-357-4659 | C |
| lay | Krabbenhoft & Sons, Inc., Sabin | 218-789-7206 | C | Lincoln | Anderson, Merv, Porter | 507-223-7981 | C |
| lay | Wetterlin, Jerry & Aaron, Glyndon | 218-494-3339 | C | Lincoln | Jerzak, Jerome, Ivanhoe | 507-694-1582 | C |
| irant | Westrom, Chad B., Elbow Lake | 218-685-4232 | C | Mahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | C |
| ittson | Anderson Farms (Darwyn), Karlstad | 218-436-2199 | C | Marshall | Circle M, Warren | 218-745-5610 | C |
| ittson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | C | Marshall | Farmers Elevator Company, Alvarado | 218-965-4812 | C |
| ittson | Johnson Farms, Inc., Lloyd, Karlstad | 218-436-2817 | C | Marshall | Field Brothers Farms, Inc., Stephen | 218-478-3508 | C |
| ittson | Wiese, Inc., Kenneth A., Humboldt | 218-379-3120 | C | Marshall | Field, William, Stephen | 218-478-3508 | C |
| ittson | Younggren, Dan, Hallock | 218-843-3318 | C | Marshall | Gajewski, Justin, Stephen | 218-478-2749 | C |
| ake of Woods | Helmstetter Farm, Roosevelt | 218-442-7285 | C R | Marshall | Hammerlund Farms, Oslo | 218-695-3481 | C |
| fahnomen | Bursch Farms, Inc., Mahnomen | 218-935-5353 | C | Marshall | Hoper, Gary J., Stephen | 218-478-2441 | C |
| fahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | C | Marshall | Jensen Farms, Stephen | 218-478-3398 | R |
| farshall | Backstrom Farms, Inc., Warren | 218-745-5113 | C | Marshall | Kowalski, James, Stephen | 218-478-3899 | C R |
| farshall | Baird Farms, Inc., Warren | 218-745-5330 | C | Marshall | McGlynn, Neil, Stephen | 218-478-2777 | C |
| farshall | Bring, Sharon, Strandquist | 218-874-3713 | C | Marshall | Peterson, John C., Stephen | 218-478-3555 | C |
| farshall | Farmers Elevator Company, Alvarado | 218-965-4812 | C | Marshall | Philipp, D. Joe, Goodridge | 218-681-5574 | C |
| farshall | Hammerlund Farms, Oslo | 218-695-3481 | C | Marshall | Riopelle, Jack L., Argyle | 218-437-8147 | R |
| farshall | Jensen Farms, Stephen | 218-478-3398 | C R | Marshall | Rivard Farms, G.A., Argyle | 218-437-6638 | R |
| farshall | Kowalski, James, Stephen | 218-478-3899 | R | Marshall | Robertson Brothers, Argyle | 218-437-6411 | R |
| farshall | Kuznia, Kenneth J., Argyle | 218-437-8203 | R | Marshall | Stusynski, David, Strandquist | 218-436-2717 | C |
| farshall | McGlynn, Neil, Stephen | 218-478-2777 | C | McLeod | Thalman Seeds Inc., Plato | 320-238-2185 | C |
| farshall | Peterson, Maynard, Stephen | 218-478-3859 | C | Meeker | Smith, Steven, Darwin | 320-693-6769 | C |
| farshall | Riopelle, Jack L., Argyle | 218-437-8147 | R | Meeker | Wigen Seed Farm, Litchfield | 320-693-8182 | C |
| orman | Chisholm, Keith P., Gary | 218-356-8674 | C R | Norman | Black, Roger, Bejou | 218-945-3550 | C |
| olk | Balstad, Scott, Fosston | 218-435-6311 | C | Norman | Brandt, Robert Jr., Ada | 218-784-4093 | C |
| olk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C | Norman | Brandt, Wayne G. & John, Ada | 218-784-4774 | C |
| olk | Gullekson, Ray, Brent & Brian, Beltrami | 218-926-5642 | C | Norman | Chisholm, Keith P., Gary | 218-356-8674 | C |
| olk | Novak, James, Angus | 218-745-5048 | R | Norman | Circle C Seeds, Gary | 218-356-8214 | C |
| olk | Ostenaar, Sidney & DeWayne, Mc Intosh | 218-563-7395 | C | Norman | Peppel Bros. Donald & Dennis, Borup | 218-582-3242 | C |
| olk | Peterson, D.W., Inc., Warren | 218-745-4507 | C R | Norman | Ramstad Brothers, Ada | 218-784-7190 | C |
| olk | Vig Farms Inc., Fosston | 218-435-1316 | R | Otter Tail | Lein, Keith, Fergus Falls | 218-736-7735 | C |
| oseau | Kukowski, Jim, Strathcona | 218-781-2478 | R | Otter Tail | Walkup, John, Campbell | 218-739-2580 | C |
| ilkin | Steenblock Farms, Dale, Campbell | 218-630-5500 | C | Out of state | Anderson, Gerald D, Grand Forks | 701-775-8766 | C R |
| ilkin | Torkelson, Dennis & Brent, Foxhome | 218-736-4607 | C | Pennington | Mehrkens, Kyle, Thief River Falls | 218-681-4611 | C |
| tagar | | | | Pennington | Scholin Farms, Thief River Falls | 218-964-5268 | C R |
| ittson | Hunter, Daniel, Lancaster | 218-762-5331 | C | Pennington | Swanson, Curtis W., Thief River Falls | 218-964-5619 | C |
| ngot | | | | Pennington | Trontvet, Daniel, Thief River Falls | 218-681-4028 | C |
| ecker | Hein Farms, Inc., Audubon | 218-439-6621 | C | Polk | Ag Farms, Crookston | 218-281-2840 | C |
| ig Stone | Clinton Ag Service, Inc., Clinton | 320-325-5203 | C | Polk | Amiot, Regis, Crookston | 218-281-1255 | C |
| lay | Benedict Farms, Inc., Sabin | 218-789-7326 | C | Polk | Anderson Farms, Inc., J.D., E. Grand Forks | 218-773-2280 | C |
| lay | Brendemuhl, Inc., M-D, Moorhead | 218-233-5192 | C | Polk | Brule, David A., Crookston | 218-281-2944 | C |
| lay | Evert Farms Ltd Partnership, Sabin | 218-789-7338 | C R | Polk | Brule, Todd, Crookston | 218-281-3148 | C |
| lay | Heartland Seeds, Moorhead | 218-585-4621 | C | Polk | Caillier, Daniel, Crookston | 218-281-2840 | C |
| lay | Iverson, Dwight, Hitterdal | 218-962-3219 | C | Polk | Capistran Seed Company, Crookston | 218-281-7840 | C |
| lay | Krabbenhoft & Sons, Inc., Sabin | 218-789-7206 | C | Polk | Christian Farms, Stuart & Dwight, Fertile | 218-945-6021 | C |
| lay | Kuehl Bros. Farms, Glyndon | 218-498-2141 | C | Polk | Dufault, Tim, Crookston | 218-281-1880 | C |
| lay | Lee Seed Farm, Borup | 218-494-3330 | C | Polk | H & J Farms, Inc., Warren | 218-745-5018 | R |
| lay | Petermann Seeds, Inc., Hawley | 218-483-3302 | C R | Polk | Hanson, Paul M, Crookston | 218-281-5898 | C |
| lay | Peterson Farm, Sherwood E., Sabin | 218-789-7378 | C | Polk | Johnson, Myron J., E. Grand Forks | 218-773-1791 | C |
| lay | Rodke, Steve, Hawley | 218-937-5672 | C | Polk | Kovar, Frank & Duane, E. Grand Forks | 218-773-9238 | C |
| lay | Siffers Farm, Moorhead | 218-233-7841 | R | Polk | Larson Brothers Farming, J. & D., Fertile | 218-945-6736 | C |
| lay | Tri-County Co-op Assn., Ulen | 218-596-8821 | C | Polk | Larson Farms, Inc., Ralph, E. Grand Forks | 218-773-1463 | R |
| lay | Valan, Orien Jr., Moorhead | 218-236-9479 | C | Polk | Larson Farms, Jerry Larson, Climax | 218-857-3345 | C R |
| | | | | Polk | Larson, Arlan Farms, Inc., Climax | 218-857-2535 | C |

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| Polk | Mat - Co., Inc., Fosston | 218-435-6667 | C R |
| Polk | Mid-Valley Grain Cooperative, Crookston | 218-281-2881 | C |
| Polk | Nelson, Jon W., Oslo | 218-695-3691 | C |
| Polk | Novacek, Ronald, E. Grand Forks | 218-773-2293 | C |
| Polk | Novak, James, Angus | 218-745-5048 | C |
| Polk | Ostenaar, Sidney & DeWayne, Mc Intosh | 218-563-7395 | C |
| Polk | Peterson, D.W., Inc., Warren | 218-745-4507 | C R |
| Polk | Peterson, Douglas, E. Grand Forks | 218-773-9120 | C R |
| Polk | Ross Seed Co., Fisher | 218-891-2211 | C |
| Polk | Sonstelie, Gordon & Gary, Winger | 218-938-4189 | C |
| Polk | Thompson Bros. Farms, LLP, E. Grand Forks | 218-773-2251 | C |
| Polk | Thorson Farm, Inc., J. O., E. Grand Forks | 218-893-2285 | C R |
| Polk | Vig Farms Inc., Fosston | 218-435-1316 | C |
| Red Lake | Hinrichs, Roger, Red Lake Falls | 218-253-2295 | C |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C R |
| Red Lake | Vathauer Farm, Red Lake Falls | 218-253-2490 | R |
| Redwood | Sawvell's Seed, Inc., Clements | 507-692-2240 | C |
| Redwood | Sawvell, Ronald, Clements | 507-692-2240 | C |
| Roseau | Habstritt Farms, Inc., Roseau | 218-463-1193 | C |
| Roseau | Kukowski, Jim, Strathcona | 218-781-2478 | R |
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | C |
| Swift | Nelson Seed Company, Benson | 320-843-3610 | C |
| Todd | Faust, Kevin, Long Prairie | 320-732-3361 | C |
| Traverse | Johnson, Merton, Wheaton | 320-563-8025 | C |
| Traverse | Triple E Farms, Inc., Wheaton | 320-563-4239 | C |
| Wilkin | Beyer Seed Farm, Kent | 218-643-5126 | C R |
| Wilkin | Friederichs Farm, Foxhome | 218-643-2363 | C R |
| Wilkin | Haugrud Seed Plant, Rothsay | 218-493-4275 | C R |
| Wilkin | Knapp Seed Farm, Inc., Foxhome | 218-739-3366 | C |
| Wilkin | Korinek, John, Campbell | 218-643-2571 | C |
| Wilkin | Nelson, Bradley, Wolverton | 218-995-2299 | C R |
| Wilkin | Nordick, J & R, Rothsay | 218-867-2605 | C |
| Wilkin | Steenblock Farms, Dale, Campbell | 218-630-5500 | C |
| Wilkin | Torkelson, Dennis & Brent, Foxhome | 218-736-4607 | C |
| Ivan | | | |
| Clay | Lee Seed Farm, Borup | 218-494-3330 | C |
| Grant | Thiel Seed Service, Wendell | 218-458-2415 | C |
| Kittson | Hunter, Daniel, Lancaster | 218-762-5331 | C |
| Kittson | Petersen, Ronald L., Lake Bronson | 218-754-4631 | C |
| Polk | Capistran Seed Company, Crookston | 218-281-7840 | C R |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C |
| Polk | Nelson, Jon W., Oslo | 218-695-3691 | C |
| Polk | Ross Seed Co., Fisher | 218-891-2211 | C |
| Renville | Ziffer Seed Company, Inc., Bird Island | 320-365-3674 | C |
| Kulm | | | |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Lars | | | |
| Renville | Ziffer Seed Company, Inc., Bird Island | 320-365-3674 | C |
| Marshall | | | |
| Roseau | Klein, Jerel, Greenhusin | 218-782-2883 | C |
| Roseau | Kukowski, Jim, Strathcona | 218-781-2478 | C |
| McVey | | | |
| Kittson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | C R |
| Kittson | Klein, David, Hallock | 218-843-2451 | C |
| Kittson | Klein, Todd, Scott & Kevin, Hallock | 218-843-2764 | C |
| Kittson | Schwenzler Bros., Hallock | 218-754-6891 | C |
| Kittson | Sorenson, David, Hallock | 218-843-3436 | C |
| Kittson | Stronsgren Farms, Lake Bronson | 218-754-7405 | C |
| Mahnomen | Bursch Farms, Inc., Mahnomen | 218-935-5353 | C |
| Marshall | Baird Farms, Inc., Warren | 218-745-5330 | C |
| Marshall | Jensen Farms, Stephen | 218-478-3398 | C R |
| Marshall | Kruger Bros. Farms, Inc., Warren | 218-437-8435 | C |
| Marshall | Peterson Farms of Warren, Inc., D.L., Warren | 218-745-4077 | C |
| Marshall | Tulibaski Brothers, Argyle | 218-437-8415 | C |
| Polk | Larson, Roger O., Euclid | 218-281-5697 | R |
| Polk | Pulkrabek Farms, Inc. Gary, Angus | 218-745-5891 | R |

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| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C |
| Roseau | Habstritt Farms, Inc., Roseau | 218-463-1193 | C R |
| Roseau | Magnusson Farms, Roseau | 218-463-2374 | C |
| Roseau | Marvin's, Warroad | 218-386-1333 | R |
| Nora | | | |
| Polk | Capistran Seed Company, Crookston | 218-281-7840 | C |
| Norm | | | |
| Grant | Westrom, Chad B., Elbow Lake | 218-685-4232 | C |
| Oxen | | | |
| Big Stone | Clinton Ag Service, Inc., Clinton | 320-325-5203 | C |
| Brown | Rossbach Lakeside Seeds, Inc., Hanska | 507-794-7698 | C |
| Clay | Heartland Seeds, Moorhead | 218-585-4621 | C |
| Clay | Johnson, Brian M., Hawley | 218-962-3316 | C |
| Clay | Krabbenhoft & Sons, Inc., Sabin | 218-789-7206 | C |
| Clay | Kuehl Bros. Farms, Glyndon | 218-498-2141 | C |
| Clay | Lee Seed Farm, Borup | 218-494-3330 | C |
| Clay | Petermann Seeds, Inc., Hawley | 218-483-3302 | C R |
| Clay | Peterson Farm, Sherwood E., Sabin | 218-789-7378 | C |
| Clay | Thompson, Shane, Moorhead | 218-236-6582 | C |
| Clay | Tri-County Co-op Assn., Ulen | 218-596-8821 | C |
| Clay | Valan, Orlen Jr., Moorhead | 218-236-9479 | C |
| Clay | Wetterlin, Jerry & Aaron, Glyndon | 218-494-3339 | C |
| Clay | Zimmerman, Wayne, Ulen | 218-596-8628 | C |
| Dodge | Koss, William, Dodge Center | 507-374-6786 | R |
| Douglas | Sward Seed Farm, Nelson | 320-762-0143 | C |
| Douglas | Thompson Farms, Kensington | 320-965-2486 | C |
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C R |
| Grant | Adams Seed, Wendell | 218-458-2151 | C |
| Grant | Backman Seeds, Inc., Herman | 320-677-2231 | C |
| Grant | Backman, Tim, Herman | 320-677-2785 | R |
| Grant | Biss, Larry, Wendell | 218-458-2205 | R |
| Grant | Kapphahn, John M., Elbow Lake | 218-685-4604 | R |
| Grant | Kjesbo, Noel J., Wendell | 320-284-2226 | C |
| Grant | Red River Marketing Co., Elbow Lake | 218-685-6100 | C R |
| Grant | Thiel Seed Service, Wendell | 218-458-2415 | C |
| Grant | Westrom, Chad B., Elbow Lake | 218-685-4232 | C R |
| Kandiyohi | Behm Seed Company, Atwater | 320-974-3003 | C R |
| Kandiyohi | Loge, Alan, Willmar | 320-235-4178 | C |
| Kittson | Rynning Farms, Kennedy | 218-674-4423 | R |
| Lac qui Parle | Buer, Reid, Canby | 507-223-7946 | C |
| Lac qui Parle | Hermanson Seed Plant, Boyd | 320-855-2582 | C |
| Lac qui Parle | Kemen, Robert & Sons, Madison | 320-769-4413 | C R |
| Lake of Woods | Helmstetter Farm, Roosevelt | 218-442-7285 | C |
| Le Sueur | Stangler Farm Seed, Dick, Kilkenny | 507-395-2883 | C |
| Lincoln | Jerzak, Jerome, Ivanhoe | 507-694-1582 | C |
| Lincoln | Jerzak, John, Ivanhoe | 507-694-1834 | C |
| Marshall | Anderson, Harvey O. & Luther H., Stephen | 218-455-3305 | R |
| Marshall | Anderson, Joel, Alvarado | 218-965-4597 | R |
| Marshall | Anvinson, Chad, Oslo | 218-695-3585 | C |
| Marshall | Baird Farms, Inc., Warren | 218-745-5330 | C |
| Marshall | Jensen Farms, Stephen | 218-478-3398 | C |
| Marshall | Peterson, Maynard, Stephen | 218-478-3859 | R |
| Marshall | Stusynski, David, Strandquist | 218-436-2717 | C |
| McLeod | Thalman Seeds Inc., Plato | 320-238-2185 | C |
| Meeker | Anderson Seeds, Dassel | 320-286-2700 | C |
| Meeker | Johnson Seeds of Dassel, Inc., Dassel | 320-275-2430 | C |
| Meeker | Miller Seed Farm, Dassel | 320-275-2463 | C R |
| Meeker | Wigen Seed Farm, Litchfield | 320-693-8182 | C |
| Norman | Brandt, Robert, Ada | 218-784-4093 | C |
| Norman | Hanson, Corey M., Gary | 218-356-8678 | C |
| Norman | Peppel Bros. Donald & Dennis, Borup | 218-582-3242 | C |
| Otter Tail | Walkup, John, Campbell | 218-739-2580 | C |
| Polk | Bauer Farms, Erskine | 218-687-5356 | C |
| Polk | Brule, David A., Crookston | 218-281-2944 | C |
| Polk | Brule, Todd, Crookston | 218-281-3148 | C |
| Polk | Caillier, Daniel, Crookston | 218-281-2840 | C |

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| Polk | Clementson, Jon, Erskine | 218-687-2345 | C R |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C |
| Polk | Larson, Arlan Farms, Inc., Climax | 218-857-2535 | C |
| Polk | Mat - Co., Inc., Fosston | 218-435-6667 | C R |
| Polk | Mid-Valley Grain Cooperative, Crookston | 218-281-2881 | C |
| Polk | Peterson, D.W., Inc., Warren | 218-745-4507 | C R |
| Polk | Vig Farms Inc., Fosston | 218-435-1316 | R |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C |
| Red Lake | Vatthauer Farm, Red Lake Falls | 218-253-2490 | C |
| Redwood | Sawvell's Seed, Inc., Clements | 507-692-2240 | C |
| Renville | Enestvedt Bros., Sacred Heart | 320-765-2728 | C |
| Renville | JSE, Inc. (Johnson Seed Farm), Sacred Heart | 320-765-2225 | C |
| Renville | Kiecker, Greg, Hector | 507-426-8167 | R |
| Roseau | Genex Harvest States Salol Elevator (Greenbush), Greenbush | 218-782-2111 | C |
| Roseau | Habstritt Farms, Inc., Roseau | 218-463-1193 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |
| Stearns | Middendorf Seed Farm, Sauk Centre | 320-352-6053 | C |
| Stevens | Haberer Seed Farm, Morris | 320-795-2468 | C |
| Stevens | Sperr, Duane & Rollie, Donnelly | 320-246-3496 | C |
| Swift | Busse Seeds, Appleton | 320-394-2315 | C R |
| Swift | Falk Seed Farm, Murdock | 320-875-4341 | C R |
| Swift | Lee's Seed Farm, Benson | 320-843-2857 | C |
| Swift | Nelson Seed Company, Benson | 320-843-3610 | C |
| Traverse | Lundquist Seed, Inc., Wheaton | 320-563-8622 | C |
| Traverse | Lundquist, Gene, Wheaton | 320-563-8644 | C |
| Traverse | Rinke, David, Wheaton | 320-563-4864 | R |
| Wilkin | Beyer Seed Farm, Kent | 218-643-5126 | C R |
| Wilkin | Haugrud Seed Plant, Rothsay | 218-493-4275 | C R |
| Wilkin | Knapp Seed Farm, Inc., Foxhome | 218-739-3366 | C |
| Wilkin | Nordick, J & R, Rothsay | 218-867-2605 | C |
| Wilkin | Steenblock Farms, Daie, Campbell | 218-630-5500 | C |
| Wright | Hopkins, Joseph, Buffalo | 763-682-1868 | C |
| Wright | Terning Seeds, Inc., Cokato | 320-286-2168 | C |

Parshall

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| Kittson | Carlson, James A., Hallock | 218-843-3483 | C |
| Marshall | Backstrom Farms, Inc., Warren | 218-745-5113 | C |
| Marshall | Farmers Elevator Company, Alvarado | 218-965-4812 | C |
| Polk | Ritoch, Thomas, Alvarado | 218-965-4666 | C |
| Swift | Nelson Seed Company, Benson | 320-843-3610 | C |
| Wilkin | Knapp Seed Farm, Inc., Foxhome | 218-739-3366 | R |

Reeder

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| Clay | Heartland Seeds, Moorhead | 218-585-4621 | R |
| Clay | Lee Seed Farm, Borup | 218-494-3330 | R |
| Clay | Tobolt Seed, Moorhead | 218-287-2904 | R |
| Grant | Red River Marketing Co., Elbow Lake | 218-685-6100 | R |
| Kittson | Bloomquist Farms, Inc., Drayton | 218-455-3863 | R |
| Kittson | Carlson, James A., Hallock | 218-843-3483 | C |
| Kittson | Olsonawski, Jerry, Hallock | 218-379-3235 | R |
| Kittson | Stewart, H. Shane, St. Vincent | 218-379-3282 | R |
| Kittson | Stewart, Hilson L., St. Vincent | 218-379-3282 | R |
| Mahnomen | Pazdernik Farms, Inc., Waubun | 218-473-2232 | R |
| Marshall | Kowalski, James, Stephen | 218-478-3899 | R |
| Marshall | Peterson Farms of Warren, 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 |
| Marshall | Yutzenka, Don and Mark, Argyle | 218-437-8428 | R |
| Norman | Brandt, Wayne G. & John, Ada | 218-784-4774 | R |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | R |
| Polk | Larson, Ray H., Inc., Angus | 218-745-5923 | R |
| Polk | Mat - Co., Inc., Fosston | 218-435-6667 | R |
| Polk | Peterson, D.W., Inc., Warren | 218-745-4507 | R |
| Polk | Peterson, Douglas, E. Grand Forks | 218-773-9120 | R |
| Polk | Tiedemann, Gene R., Euclid | 218-281-6723 | R |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | R |
| Roseau | Kukowski, Jim, Strathcona | 218-781-2478 | R |

| | | | |
|--------|-----------------------------|--------------|---|
| Swift | Nelson Seed Company, Benson | 320-843-3610 | R |
| Wilkin | Nelson, Bradley, Wolverton | 218-995-2299 | R |

Russ

| | | | |
|------------|---|--------------|-----|
| Marshall | Farmers Elevator Company, Alvarado | 218-965-4812 | C |
| Marshall | Yutzenka, Don and Mark, Argyle | 218-437-8428 | C |
| Pennington | Scholin Farms, Thief River Falls | 218-964-5268 | C |
| Polk | Bauer Farms, Erskine | 218-687-5356 | C |
| Polk | Brule, David A., Crookston | 218-281-2944 | C |
| Polk | Clementson, Jon, Erskine | 218-687-2345 | C R |
| Polk | Johnson, Myron J., E. Grand Forks | 218-773-1791 | C |
| Polk | Peterson, D.W., Inc., Warren | 218-745-4507 | C R |
| Polk | Thorson Farm, Inc., J. O., E. Grand Forks | 218-893-2285 | C |
| Polk | Thorson, Osmund and Chad, E. Grand Forks | 218-893-2285 | C |
| Red Lake | Myhre Farms, Red Lake Falls | 218-698-4485 | C |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C |
| Roseau | Genex Harvest States Salol Elevator (Greenbush), Greenbush | 218-782-2111 | C |
| Traverse | Lundquist Seed, Inc., Wheaton | 320-563-8622 | C |
| Traverse | Lundquist, Steven, Wheaton | 320-563-8644 | C |

Verde

| | | | |
|---------------|--|--------------|-----|
| Lake of Woods | Helmstetter Farm, Roosevelt | 218-442-7285 | C R |
| Mahnomen | Bursch Farms, Inc., Mahnomen | 218-935-5353 | C |
| Mahnomen | Haugo, David, Waubun | 218-473-2254 | C |
| Marshall | Holte, Steven, Grygla | 218-294-6537 | C |
| Marshall | Jensen Farms, Stephen | 218-478-3398 | C |
| Marshall | Kuznia, Kenneth J., Argyle | 218-437-8203 | R |
| Marshall | Nelson Farm % Doyle, Goodridge | 218-681-6972 | R |
| Marshall | Robertson Brothers, Argyle | 218-437-6411 | R |
| Norman | Kveno, Harry, Gary | 218-356-8278 | R |
| Pennington | Swanson, Curtis W., Thief River Falls | 218-964-5619 | C |
| Red Lake | Swenson Seed Farm, Brooks | 218-796-5285 | C R |
| Roseau | Genex Harvest States, Salol Elevator (Greenbush), Greenbush | 218-782-2111 | C |
| Roseau | Kilen, Jerel, Greenbush | 218-782-2883 | C |
| Roseau | Kukowski, Jim, Strathcona | 218-781-2478 | C R |

WHITE CLOVER

Will

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

WINTER WHEAT

Arapahoe

| | | | |
|----------|------------------------------------|--------------|---|
| Le Sueur | Stangler Farm Seed, Dick, Kilkenny | 507-595-2883 | C |
| McLeod | Thalman Seeds Inc., Plato | 320-238-2185 | C |
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | C |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C |
| Todd | Brekke, Floyd, Eagle Bend | 218-738-2672 | C |

Crimson

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

Elkhorn

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

Harding

| | | | |
|---------|-----------------------------|--------------|---|
| Meecker | Wigen Seed Farm, Litchfield | 320-693-8182 | R |
| Roseau | Magnusson Farms, Roseau | 218-463-2374 | R |

Nekota

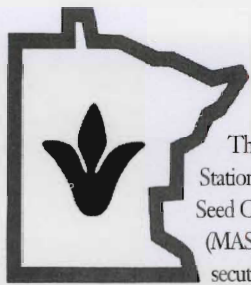
| | | | |
|--------|-------------------------|--------------|---|
| Roseau | Magnusson Farms, Roseau | 218-463-2374 | R |
|--------|-------------------------|--------------|---|

Seward

| | | | |
|----------|---|--------------|---|
| Freeborn | Albert Lea Seed House, Inc., Albert Lea | 507-373-3161 | C |
| Scott | Hauer Farms, Inc., Shakopee | 952-445-7554 | C |

Tandem

| | | | |
|--------|-----------------------------------|--------------|---|
| Norman | Chisholm, Keith P., Gary | 218-356-8674 | R |
| Polk | Fosston Co-op Seed House, Fosston | 218-435-6222 | C |



Minnesota Approved Seed Conditioners and Marketing Association

The Minnesota Agricultural Experiment Station appreciates the Minnesota Approved Seed Conditioners and Marketing Association's (MASCMA) long-time support and third consecutive generous financial contribution toward the publication of *Varietal Trials of Farm Crops*.

Member plants of this association are identified by the symbol shown above. In addition to being approved for conditioning certified seed by the Minnesota Crop Improvement Association (MCIA) 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 the state. 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 MCIA to assure that all requirements for approved plant status are met. Seed conditioning identified by the symbol of The Minnesota Approved Seed Conditioners and Marketing Association are a wise choice for quality seed conditioning services.

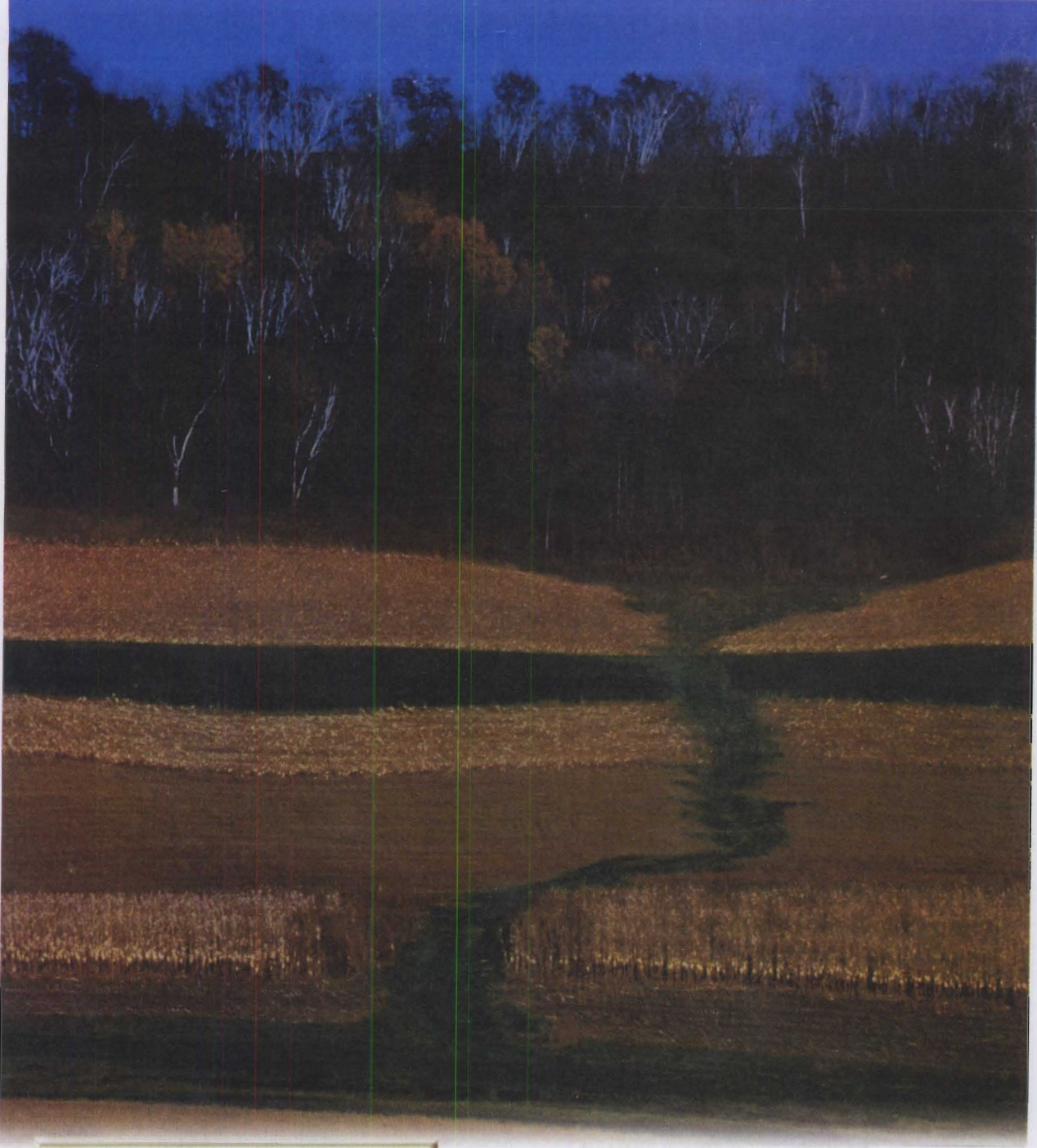
| | | | | | |
|-------------------------------|-------------------|--------------|---------------------------------|-----------------|--------------|
| Adams Seed | Wendell | 218-458-2151 | Lee Seed Farm | Borup | 218-494-3330 |
| Albert Lea Seed House | Albert Lea | 507-373-3161 | Lee's Seed Farm | Benson | 320-843-2857 |
| Angell Seed Farm | Blooming Prairie | 507-583-7581 | Lincoln County Feed & Seed | Ivanhoe | 507-694-1243 |
| Backman Seeds | Herman | 320-677-2231 | Marvin's | Warroad | 218-386-1333 |
| Behm Seed Company | Atwater | 320-974-3003 | McFarlane Seeds | Greenbush | 218-782-2700 |
| Beyer Seed Farm | Kent | 218-643-5126 | Meyer's Seed | Elgin | 507-876-2482 |
| Bloomquist Farms | Drayton, N.D. | 218-455-3863 | Mid-Valley Grain Cooperative | Crookston | 218-281-2881 |
| Borg Seed Farms | Cokato | 320-286-2222 | Nietfeld Farm | Melrose | 320-987-3442 |
| Buer's Seeds | Canby | 507-223-5100 | Petermann Seeds | Hawley | 218-483-3302 |
| Bursch Seed Company | Mahnomen | 218-935-2772 | Red River Marketing Company | Elbow Lake | 218-685-6100 |
| Capistran Seed Company | Crookston | 218-281-7840 | Rivard's Quality Seeds | Argyle | 218-437-6638 |
| Circle C Seeds | Gary | 218-356-8214 | Ron Petersen Seeds | Lake Bronson | 218-754-4631 |
| Clearwater Valley Seeds | Gully | 218-268-4171 | Ross Seed Company | Fisher | 218-891-2211 |
| Clinton Ag Service | Clinton | 320-325-5203 | Rossbach Lakeside Seeds | Hanska | 507-794-7698 |
| Corning Seed & Supply | Austin | 507-433-9002 | Sawvell's Seed | Clements | 507-692-2240 |
| Crop Production Services | Perham | 218-346-2355 | Spronk & Sons Seed Farm | Edgerton | 507-442-5334 |
| Dahlco Seeds | Cokato | 320-286-5982 | State Line Farmers Cooperative | Madison | 320-598-7351 |
| Dammann Seed Farms | Plato | 320-864-3004 | Storden Seed & Chemical Service | Storden | 507-445-3217 |
| Enestvedt Brothers | Sacred Heart | 320-765-2728 | Swenson Seed Farm | Brooks | 218-796-5285 |
| Falk Seed Farm | Murdock | 320-875-4341 | Thiel Seed Service | Wendell | 218-458-2415 |
| Farmers Co-op Grain & Seed | Thief River Falls | 218-681-6281 | Tobolt Seed | Moorhead | 218-287-2904 |
| Galler Seeds | Elysian | 507-267-4328 | McIntyre Farms | Cassleton, N.D. | 701-347-5355 |
| Haberer Seed Farm | Morris | 320-795-2468 | Watonwan 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 | 320-855-2527 | Zabel Seeds | Plainview | 507-534-2487 |
| Farmers Cooperative Assn. | Jackson | 507-847-4160 | Ziller Seed Company | Bird Island | 320-365-3674 |
| Jensen Seed Company | Stephen | 218-478-3397 | Zimmerman Seeds | Racine | 507-378-2077 |
| JSF, Inc. (Johnson Seed Farm) | Sacred Heart | 320-765-2225 | | | |
| Kiecker Seed Company | Hector | 507-426-8167 | | | |
| Knapp Seed Farm | Foxhome | 218-739-3366 | | | |
| L.B. Grain | Lake Bronson | 218-754-4200 | | | |

Planting Rate and Date

Planting 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 |
| Barley | 56 | — | — | 33,000/acre | April 15/May 5 |
| Bean | | | | | |
| 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 |
| Bean | 56 | 88,000 | 42 | 85/sq. ft. | April 15/May 15 |
| Grass | | | | | |
| Range 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 |
| Range 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 | 653,000 | 2 | 30/sq. ft. | Early spring to August 10 |
| Birdsfoot trefoil alone | 60 | 372,000 | 8 | 70/sq. ft. | Early spring or summer |
| Birdsfoot trefoil in mixtures | — | — | 6 | 50/sq. ft. | Early spring or summer |
| Cicer milkvetch | 60 | 122,000 | 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 |
| Timothy | 32 | 16,200 | 60 | 28/sq. ft. | Early spring |
| Timothy | 56 | 18,200 | 60 | 25/sq. ft. | September 1 |
| Barley, rows 18 to 40 in. | 56 | 15,000 | 10 | 150,000/acre | May 20 to June 5 for grain |
| Barley, rows 6 to 14 in. | — | — | 15 | 5/sq. ft. | — |
| Bean, 7-in. rows | 60 | 2,800 | 56 | 2/ft. of row | May 1 to May 10 |
| Bean, 10-inch rows | — | — | — | 3/ft. of row | — |
| Bean, 20-in. rows | — | — | — | 6/ft. of row | — |
| Bean, 22-in. rows | — | — | — | 7/ft. of row | — |
| Bean, 30-in. rows | — | — | — | 9/ft. of row | — |
| Flower, nonoilseed | 24 | 4,300 | 4 | 17,000/acre | May 1–June 15 |
| Flower, 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. | Aug 20/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 1½-2 bu. oat | — | — | 70 | 4/sq. ft. | Early spring |
| Fababean, medium size | 60 | 1,300 | 180 | 5/sq. ft. | Early spring |
| Fababean, with 2 bu. oat | — | — | 60 | 2/sq. ft. | Early spring |
| Lentil, small | 60 | 15,600 | 55 | 20/sq. ft. | Early spring |
| Millet, foxtail | 48 | 218,000 | 15 | 75/sq. ft. | June 15/July 15 |
| Millet, proso | 56 | 65,000 | 20 | 30/sq. ft. | June 15/July 15 |
| Sudangrass, rows 6 to 14 in. | 40 | 44,000 | 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 | 10 | 55/sq. ft. | Early spring |
| Wildrice (wet) | 25 | 7,900 | 33 | 6/sq. ft. | Late fall |

S. legal bushel weight or, if not established, the weight most widely accepted. ² See page 55 for best way to calculate hard red spring wheat planting rate.



MINNESOTA AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF MINNESOTA

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