# MINNESOTA VARIETAL TRIALS RESULTS

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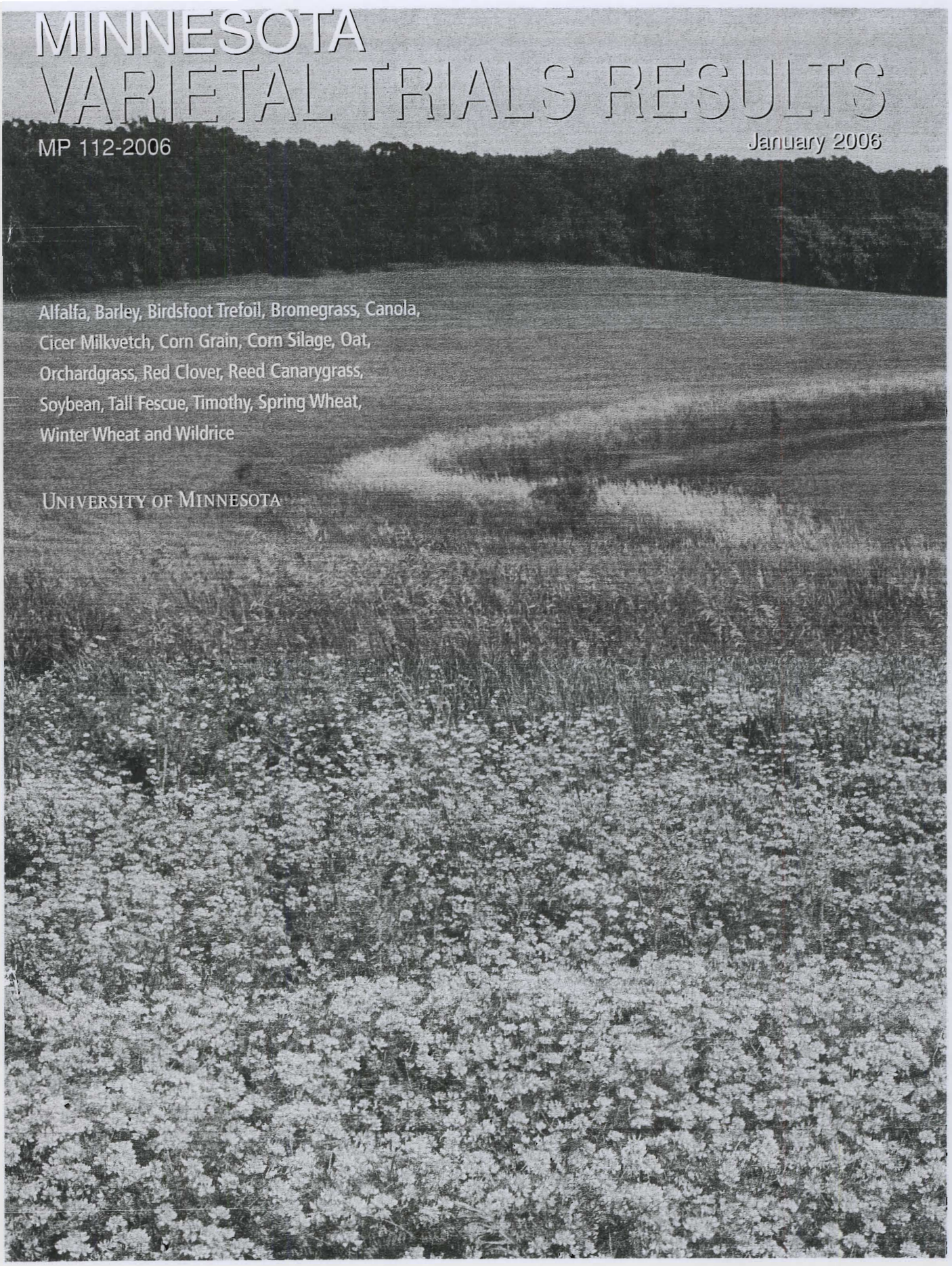

Alfalfa, Barley, Birdsfoot Trefoil, Bromegrass, Canola, Cicer Milkvetch, Corn Grain, Corn Silage, Oat, Orchardgrass, Red Clover, Reed Canarygrass, Soybean, Tall Fescue, Timothy, Spring Wheat, Winter Wheat and Wildrice

UNIVERSITY OF MINNESOTA

# Minnesota
# VARIETAL TRIALS RESULTS

To help growers select varieties best adapted to a specific area the MAES compares varieties in trial plots at St. Paul, Becker, Crookston, Grand Rapids, Lamberton, Morris, Rosemount and Waseca, and on farmers' fields. Crop varieties are grown in replicated plots at each location and factors affecting yield and their characteristics are as nearly the same as possible for all varieties at each location. Not all crop varieties included in previous editions of Minnesota Varietal Trials are included in this 2006 edition. If you have a question about such a crop, contact the author(s) of the related crop section.

### *Certified Seed*

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

### *Interpreting the tables*

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

If the yield difference between two varieties equals or exceeds the LSD value for the yield column, the higher-yielding variety probably was superior in yield. If the difference is less than the LSD the yield difference probably was due to environmental factors. An "NS" notation in a column indicates no significant difference for that characteristic.

The relative maturities of varieties are variously indicated in the tables as date of maturity, date of heading or blooming, days to maturity, heading or blooming, or moisture percentage at harvest. These varietal trials are not designed for crop (species) comparisons. The crops are grown on different fields or with different management. The data should be used only to compare varieties within a table.

### *Abbreviations*

To save space in variety descriptions and some other listings the abbreviation "AES" may be used for agricultural experiment station.

### *Researchers*

Information on the reaction of crop varieties to specific pathogens was obtained mainly by R. Dill-Macky, and B. Steffenson, Department of Plant Pathology; J. Kolmer, USDA-ARS Cereal Disease Laboratory; and F. Kolb, University of Illinois–Urbana. Gary Hareland, USDA-ARS Wheat Quality Laboratory, Fargo, provided grain quality data.

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Go to: www.mncia.org

Information on this Minnesota Agricultural Experiment Station (MAES) web site is presented under authority granted by the Hatch Act of 1887 to conduct performance trials on farm crops and interpret data to the public.



In accordance with the American With Disabilities Act, this information is available in alternative forms upon request. Contact the University of Minnesota Distribution Center at 612-625-8173 for information.

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Minnesota Agricultural Experiment Station
University of Minnesota

# Alfalfa

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Varietal Trials Results, January 2006

## Alfalfa Data Sources, Selection

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

Yield potential of alfalfa varieties is evaluated in trial plots at University of Minnesota Research and Outreach Centers and on cooperating farmers' fields. Plots are seeded yearly at UMORE Park in Rosemount, and alternate years at other locations. Trials are conducted using recommended fertility and pest control practices to optimize alfalfa yield and persistence.

Yield performance of tested varieties is presented as a percentage of check variety yields (average for Vernal, Oneida VR and 5312). Test locations represent the variable winter-injury risk in different regions of Minnesota. Test locations include Rosemount (Dakota Co.), Potsdam (Olmsted Co.), Lamberton (Redwood Co.), St. Martin and Richmond (Stearns Co.), Underwood (Otter Tail Co.), and Grand Rapids (Itasca Co.); see locations map. Some varieties are tested for winter survival index (WSI) and forage quality at selected sites by the Universities of Minnesota, Wisconsin and South Dakota State.

Yield results for alfalfa varieties tested in current Minnesota yield trials (2001 to 2005 seeding years) are listed in tables 1 through 4. Varieties in current winter survival, forage quality and potato leafhopper trials are listed in tables 5 through 7. Alfalfa variety seed marketers, telephone numbers and web addresses are provided in table 8. Disease resistance information for alfalfa varieties is available on the web at www.alfalfa.org.


Locations of alfalfa trials.

## Winterhardiness and Winter Survival Index

Severe winters make winterhardiness a primary consideration in variety selection for most areas of Minnesota. Winterhardiness of varieties is difficult to determine because winter injury can occur as a result of many different weather events that cause varied responses in alfalfa plants of differing ages. 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 locations (Rosemount, Minn.; South Shore, S.D.; and Arlington and Lancaster, Wis.) are the basis for the winter survival index (WSI) in table 5.

The WSI for each tested variety was averaged over all test locations and years to provide a robust estimate of winterhardiness and is presented beside yield data in tables 1 through 4. Varieties are rated from superior (WSI = 1) to no survival (WSI = 6) for winter survival ability. Vernal, a traditional winterhardy variety, is rated very good (WSI = 2). After a severe winter, injury is expected for varieties rated adequate (WSI = 4). All varieties tested to date have rated above adequate.

If a variety does not have a WSI, the company has not entered the variety in the winter survival trial. If a WSI number is not available, yield performance in the third production year after seeding may be the next best indicator of winter survival potential. Fall-dormancy rating used to be a good indicator of winter survival potential, but with modern varieties this is no longer the case.

When selecting alfalfa varieties for your farm, greatest winterhardiness is needed in west central and northwestern Minnesota (see winter injury potential map). Because of the high frequency of severe winters in these areas, only varieties with at least Very Good (WSI~2) winter survival should be selected in these regions. East central and southeastern Minnesota

also frequently experience severe winters. Southwestern Minnesota seldom experiences severe winter injury because of dry soils, high soil potassium levels and neutral soil pH. Northeastern Minnesota also seldom experiences severe winter injury because of dependable snow cover.


## Forage Yield

Yield results for alfalfa varieties tested in current Minnesota trials are presented in tables 1 to 4. Yields are expressed as a percentage of check variety yields; for example, "113" means the variety had 13% greater yield than the average of the check varieties.

Within each table, varieties are ranked according to their average performance across ALL current trials in which they have been tested (2001 to 2005 seedings). Individual tables correspond to test results from different regions of Minnesota.

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

Varietal differences in yield tend to increase with stand age. Thus, to choose a variety for short-term stands, consider especially yield performance the first and second years after seeding (e.g. yield performance in 2004 and 2005 for a 2003 seeding). For long-term stands, choose varieties based on their performance through the third year after seeding (e.g. 2005 yield for 2002 seeding).

## Forage Quality

While maturity is the greatest determinant of forage quality or feeding value of alfalfa, varieties also differ genetically in forage-quality potential. A NAAIC-Standardized Forage Quality Test has been performed at Arlington, Wis., and Rosemount, Minn., since 1995. Forage quality of alfalfa varieties in tests seeded in 2004 (3 harvests) and 2005 (1 harvest) in Minnesota are shown in tables 6a and 6b. Production-year evaluation (first year after seeding) was done by analyzing each of three cuttings taken at late bud to 1/10-bloom stages of maturity. Data are expressed as milk per ton of forage, milk per acre and relative forage quality (RFQ).

Milk per ton is calculated based on MILK2000 and combines crude protein, neutral detergent fiber (NDF) and NDF digestibility to predict milk production per ton of forage DM. In MILK2000, the intake of energy from forage for a 1,350-pound milking cow consuming a 30% NDF diet is calculated, and the cow's maintenance energy requirement is then subtracted from energy intake to provide an estimate of energy available from forage for conversion to milk. Forage DM yield multiplied by milk per ton of forage DM provides an estimate of milk produced per acre and combines yield and quality into a single term. For a technical discussion of NDFD and Milk2000, see: www.uwex.edu/ces/forage/pubs/milk2000.htm.

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

## Potato Leafhopper Tolerance

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

Despite their potential for significant damage, PLH are not a problem in every harvest, year and region of Minnesota. PLH pressure is more consistent south and east of Minnesota. In spring 2005, a new regional PLH-tolerant alfalfa yield trial was established in collaboration with the Universities of Wisconsin, Iowa State and Ohio State. Tests were seeded in Iowa and Ohio, which are areas of more consistent PLH pressure. The results of two seeding-year harvests per location are presented in Table 7. The PLH Yield Index is based on harvests where PLH numbers exceed economic thresholds for non-resistant varieties. Note that in Minnesota and Wisconsin only three of the PLH-tolerant entries and one WSI entrant have been tested for yield.

## Diseae Resistance

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

Brown root rot is known to be present in Minnesota soils, but varietal resistance is currently unknown. While moderate resistance (MR) to a disease will provide protection to a

variety under most conditions, either resistance (R) or high resistance (HR) is required for protection under severe disease conditions.

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

## Blends

Many companies sell blends, a mixture of two or more varieties, at a reduced price from named varieties. Blends may perform as well as the best varieties or may do very poorly. Because blends may have been derived in various ways, their performance depends on the skill and integrity of the seed company. Disease resistance, yield, winter survival and other characteristics may change within a blend from lot to lot or year to year as blend composition changes. Consequently, using *certified* seed of adapted, high-yielding varieties best assures trueness to name.

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

### *Alfalfa Planting Rate and Date*

Bushel Weight, Pounds..... 60

Seeds/Pound..... 220,000

Planting Rate, Pounds/Acre

- Alone..... 13
- With Grass..... 5-10

Planting Rate, Seeds/Sq.Ft.

- Alone..... 65
- With Grass..... 25-50

Planting Date..... late April–early May or late July-early August

*Table 1. Alfalfa variety yields as a percentage of check varieties at Rosemount (Dakota County) and Potsdam (Olmsted County).*

| Variety, in descending order of average performance over all current Minn. trials. **Bold** varieties have been in Minn. trials for more than 5 site-years. | Marketer | WSI | Rosemount | | | | Potsdam | All Site-Years, Average |
|---|---|---|---|---|---|---|---|---|
| | | | 2003 Seeding, Harvest Years | | | 2004 Seeding, Harvest Year | 2004 Seeding, Harvest Year | |
| | | | 2005 | 2004 | 2-Year Total | 2005 | 2005 | |
| *Checks, Tons/Ac as Hay* | | — | *6.3* | *6.6* | *12.9* | *6.9* | *8.0* | *6.7* |
| WL 348 AP | W-L | 2.0 | — | — | — | — | 110 | 117 |
| GOLDLEAF | Al. Lea/ Gold Co. | 3.0 | 115 | 111 | 113 | — | — | 115 |
| FSG 505 | Allied | 3.0 | 118 | 111 | 114 | — | — | 115 |
| DKA33-16 | Monsanto | — | 113 | 107 | 110 | — | — | 114 |
| WL 357 HQ | W-L | 2.0 | 115 | 111 | 113 | — | — | 113 |
| FSG 406 | Allied | 2.0 | 119 | 106 | 112 | — | — | 113 |
| ***IGNITE*** | Jung | — | 104 | 101 | 102 | — | — | 112 |
| PERFECT | Grassland | — | 108 | 106 | 107 | — | — | 112 |
| PHIRST | BioPlant | — | 113 | 105 | 109 | — | — | 112 |
| STAMPEDE | Al. Lea /Allied | — | 115 | 108 | 111 | — | — | 111 |
| POWER 4.2 | Power | — | 111 | 106 | 108 | — | — | 111 |
| FSG 351 | Allied | — | 114 | 112 | 113 | — | — | 111 |

***Table 1. Alfalfa variety yields as a percentage of check varieties at Rosemount (Dakota County) and Potsdam (Olmsted County) (continued).***

| Variety, in descending order of average performance over all current Minn. trials. **Bold** varieties have been in Minn. trials for more than 5 site-years. | Marketer | WSI | Rosemount | | | | Potsdam | All Site-Year Average |
|---|---|---|---|---|---|---|---|---|
| | | | 2003 Seeding, Harvest Years | | | 2004 Seeding, Harvest Year | 2004 Seeding, Harvest Year | |
| | | | 2005 | 2004 | 2-Year Total | 2005 | 2005 | |
| *Checks, Tons/Ac as Hay* | | | *6.3* | *6.6* | *12.9* | *6.9* | *8.0* | *6.7* |
| VITRO II | North-Gro | 2.0 | 113 | 107 | 110 | — | — | 110 |
| **GH 711** | Golden Harvest | 2.0 | 114 | 113 | 113 | — | — | 110 |
| **6420** | Garst | — | 110 | 110 | 110 | — | 108 | 109 |
| **PHABULOUS II** | Trelay | — | 99 | 106 | 103 | 106 | 108 | 109 |
| NOTICE II | Channel | — | 110 | 106 | 108 | — | — | 109 |
| EVERMORE | Allied | — | 109 | 108 | 109 | — | — | 109 |
| **6415** | Garst | 2.0 | 108 | 108 | 108 | 106 | 105 | 109 |
| REBOUND 5.0 | CROPLAN | 2.5 | — | — | — | 103 | 111 | 108 |
| **EXTREME** | LG | — | 114 | 106 | 110 | — | 110 | 108 |
| **54V46** | Pioneer | 3.0 | 115 | 105 | 110 | 102 | 109 | 107 |
| **HYBRIFORCE-420/WET** | DairyLand | 3.0 | 97 | 105 | 101 | 96 | 115 | 107 |
| LIGHTNING III | Jung | 2.5 | — | — | — | 105 | 108 | 106 |
| **SOMERSET** | Syngenta | 2.5 | 109 | 102 | 105 | — | — | 106 |
| FSG 400LH | Allied | — | — | — | — | — | 105 | 105 |
| **54Q25** | Pioneer | — | 106 | 96 | 101 | 99 | 102 | 105 |
| DKA42-15 | Monsanto | 2.5 | — | — | — | 102 | — | 105 |
| ALFASTAR II | KayStar | — | 111 | 107 | 109 | — | — | 105 |
| ABUNDANCE | Ziller | 3.5 | 99 | 104 | 101 | 100 | — | 104 |
| **6400HT** | Garst | 2.5 | 103 | 96 | 99 | 101 | 105 | 104 |
| GENOA | Syngenta | 2.0 | — | — | — | 100 | 108 | 104 |
| **5312** | Check | 3.0 | 100 | 104 | 102 | 102 | 106 | 103 |
| RUGGED | Target | 2.0 | 106 | 99 | 102 | — | — | 103 |
| SUMMERGOLD | Renk | — | — | — | — | 102 | — | 102 |
| JADE III | NC+ | 2.0 | — | — | — | 102 | — | 102 |
| 4A421 | Mycogen | 2.5 | 100 | 104 | 102 | — | — | 102 |
| **54H91** | Pioneer | 3.0 | 95 | 94 | 95 | — | — | 102 |
| MACON | Allied | — | — | — | — | 101 | — | 101 |
| SURPASS | Albert Lea | — | 107 | 94 | 100 | — | — | 100 |
| BARALFA 53HR | Barenbrug | — | 103 | 97 | 100 | — | — | 100 |
| 6200HT | Garst | 2.0 | — | — | — | 99 | — | 100 |
| VIKING 357 | Al.Lea/Leg.Seed | — | — | — | — | 91 | 109 | 100 |
| WRANGLER | Public | — | 100 | 91 | 95 | — | — | 100 |
| **DAKOTA** | Great Plains | 3.5 | 103 | 97 | 100 | — | — | 100 |
| **VERNAL** | Check | 2.0 | 105 | 109 | 107 | 104 | 98 | 98 |
| **ONEIDA VR** | Check | — | 94 | 87 | 91 | 94 | 97 | 98 |
| AGATE | Public | — | 97 | 99 | 98 | — | — | 98 |
| SHAW | Albert Lea | — | — | — | — | 98 | — | 98 |
| 4500 | Legend | — | 98 | 96 | 97 | — | — | 97 |
| LEGENDAIRY 5.0 | CROPLAN | 3.0 | — | — | — | 97 | — | 97 |
| DKA50-18 | Monsanto | — | 100 | 90 | 95 | — | — | 95 |
| 4R429 | Mycogen | 4.0 | — | — | — | 91 | — | 91 |
| LSD 5% | | — | 14 | 9 | 10 | 7 | 10 | — |

***Table 2. Alfalfa variety yields as a percentage of check varieties at Lamberton (Redwood County).***

| Variety, in descending order of average performance over all current Minn. Trials. **Bold** varieties have been in Minn. Trials for more than 5 site-years. | Marketer | WSI | 2001 Seeding, Harvest Years | | | | | 2003 Seeding, Harvest Years | | | All Site-Years, Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2005 | 2004 | 2003 | 2002 | 4-Year Total | 2005 | 2004 | 2-Year Total | |
| *Checks, Tons/Ac as Hay* | | | *7.3* | *7.3* | *7.2* | *7.1* | *29.0* | *6.2* | *7.1* | *13.2* | *6.7* |
| **6410** | Garst | 2.5 | 102 | 105 | 113 | 102 | 105 | — | — | — | 112 |
| **GH 711** | Golden Harvest | 2.0 | — | — | — | — | — | 109 | 101 | 104 | 110 |
| **HYBRIFORCE-400** | DairyLand | 3.0 | 117 | 103 | 107 | 108 | 109 | — | — | — | 110 |
| **6420** | Garst | — | 111 | 105 | 108 | 106 | 108 | 111 | 108 | 109 | 109 |
| JADE II | NC+ | — | 109 | 101 | 114 | 114 | 109 | — | — | — | 109 |
| **6415** | Garst | 2.0 | — | — | — | — | — | 106 | 94 | 100 | 109 |
| **MILK RIVER** | R.J. Hunt | — | 109 | 101 | 108 | 112 | 107 | — | — | — | 108 |
| **9429** | LG | 3.0 | 107 | 96 | 99 | 104 | 101 | — | — | — | 108 |
| **54V46** | Pioneer | 3.0 | — | — | — | — | — | 104 | 96 | 100 | 107 |
| **HYBRIFORCE-420/WET** | DairyLand | 3.0 | — | — | — | — | — | 100 | 98 | 99 | 107 |
| **620** | Garst | 2.5 | — | — | — | — | — | 100 | 105 | 103 | 106 |
| **54Q25** | Pioneer | — | — | — | — | — | — | 99 | 100 | 100 | 105 |
| DKA42-15 | Monsanto | 2.5 | 100 | 115 | 108 | 99 | 106 | — | — | — | 105 |
| **AMERISTAND 403T** | Am. Alf. | 2.0 | 113 | 106 | 110 | 103 | 108 | — | — | — | 105 |
| ALFASTAR II | KayStar | — | — | — | — | — | — | 104 | 97 | 100 | 105 |
| 4 TRAFFIC | Kaltenberg | 2.5 | 109 | 99 | 100 | 105 | 103 | — | — | — | 103 |
| **5312** | Check | 3.0 | 106 | 92 | 101 | 105 | 101 | 107 | 101 | 104 | 103 |
| 54V54 | Pioneer | 2.5 | 103 | 102 | 105 | 102 | 103 | — | | | 103 |
| **FEAST +EV** | Garst | 2.0 | 98 | 114 | 111 | 101 | 106 | 91 | 97 | 94 | 103 |
| **54H91** | Pioneer | 3.0 | — | — | — | — | — | 91 | 98 | 95 | 102 |
| 53Q60 | Pioneer | 3.0 | 100 | 105 | 102 | 94 | 100 | — | — | — | 100 |
| **DAKOTA** | Great Plains | 3.5 | — | — | — | — | — | 86 | 105 | 96 | 100 |
| **VERNAL** | Check | 2.0 | 95 | 111 | 100 | 99 | 101 | 96 | 101 | 99 | 98 |
| **ONEIDA VR** | Check | — | 98 | 98 | 99 | 96 | 98 | 97 | 97 | 97 | 98 |
| RADIANT | Ampac | — | — | — | — | — | — | 73 | 96 | 85 | 84 |
| LSD 5% | | — | 8 | 8 | ns | 9 | 5 | 13 | 12 | 9 | — |

***Table 3. Alfalfa variety yields as a percentage of check varieties at Stearns County, Ottertail County and Grand Rapids (Itasca County).***

| Variety, in descending order of average performance over all current Minn. Trials. **Bold** varieties have been in Minn. Trials for more than 5 site-years. | Marketer | WSI | Stearns County | | | | | | | Ottertail County |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 2002 Seeding, Harvest Years | | | | 2003 Seeding, Harvest Years | | | 2004 Seeding, Harvest Year |
| | | | 2005 | 2004 | 2003 | 3-Year Total | 2005 | 2004 | 2-Year Total | 2005 |
| *Checks, Tons/Ac as Hay* | | | *7.4* | *7.4* | *5.4* | *20.2* | *7.2* | *6.5* | *13.7* | *7.6* |
| WL 319 HQ | W-L | 1.5 | 125 | 117 | 124 | 122 | — | — | — | 102 |
| WL 348 AP | W-L | 2.0 | — | — | — | — | 120 | 120 | 120 | — |
| PHABULOUS | Trelay | — | 116 | 112 | 119 | 115 | — | — | — | — |
| WL 327 | W-L | — | 114 | 108 | 123 | 114 | — | — | — | — |
| ROOT 66 | Trelay | 2.0 | 117 | 107 | 121 | 115 | — | — | — | — |
| GOLDLEAF | Al. Lea/Gold Co. | 3.0 | — | — | — | — | 115 | 118 | 116 | — |
| DKA33-16 | Monsanto | — | — | — | — | — | 114 | 123 | 118 | — |
| LEGENDAIRY YPQ | CROPLAN | — | 125 | 116 | 122 | 121 | — | — | — | — |
| POINTER | Dahlco | — | 116 | 105 | 119 | 113 | — | — | — | — |
| SETTER | Dahlco | — | 119 | 112 | 122 | 117 | — | — | — | — |
| **IGNITE** | Jung | — | 123 | 114 | 119 | 119 | 112 | 115 | 113 | — |
| VALUE PLUS I | Brown Seed | 3.0 | | | | | 111 | 114 | 112 | — |
| PERFECT | Grassland | — | 117 | 107 | 123 | 115 | — | — | — | — |
| **6410** | Garst | 2.5 | 123 | 115 | 125 | 120 | — | — | — | — |
| PHIRST | BioPlant | — | — | — | — | — | 111 | 116 | 114 | — |
| POWER 4.2 | Power | — | — | — | — | — | 111 | 118 | 114 | — |
| FSG 351 | Allied | — | — | — | — | — | — | — | — | 108 |
| MAXIMUM I | Johnson | — | 111 | 101 | 119 | 110 | — | — | — | — |
| **GH 711** | Golden Harvest | 2.0 | — | — | — | — | 112 | 112 | 112 | — |
| **HYBRIFORCE-400** | DairyLand | 3.0 | 112 | 108 | 114 | 111 | — | — | — | — |
| **6420** | Garst | — | — | — | — | — | 111 | 117 | 114 | — |
| **PHABULOUS II** | Trelay | — | — | — | — | — | 113 | 124 | 118 | — |
| NOTICE II | Channel | — | — | — | — | — | 106 | 116 | 110 | — |
| **6415** | Garst | 2.0 | — | — | — | — | 118 | 122 | 120 | 108 |
| **MILK RIVER** | R.J. Hunt | — | 106 | 104 | 119 | 109 | — | — | — | — |
| REBOUND 5.0 | CROPLAN | 2.5 | | | | | — | — | — | 111 |
| FSG 408DP | Allied | — | | | | | — | — | — | 108 |
| **9429** | LG | 3.0 | 117 | 106 | 125 | 115 | — | — | — | — |
| **EXTREME** | LG | — | — | — | — | — | 117 | 115 | 117 | 110 |
| **54V46** | Pioneer | 3.0 | — | — | — | — | 112 | 124 | 117 | 102 |
| **HYBRIFORCE-420/WET** | DairyLand | 3.0 | 115 | 113 | 118 | 115 | 114 | 111 | 113 | 102 |
| LIGHTNING III | Jung | 2.5 | — | — | — | — | — | — | — | 107 |
| **SOMERSET** | Syngenta | 2.5 | — | — | — | — | 110 | 117 | 113 | — |
| **620** | Garst | 2.5 | 108 | 100 | 115 | 107 | 107 | 113 | 110 | — |
| **54Q25** | Pioneer | — | 113 | 106 | 116 | 111 | 109 | 110 | 110 | 106 |
| **AMERISTAND 403T** | Am. Alf. | 2.0 | — | — | — | — | — | — | — | — |
| BOBWHITE | NC+ | — | — | — | — | — | — | — | — | 104 |
| ABUNDANCE | Ziller | 3.5 | — | — | — | — | 111 | 107 | 109 | — |
| **6400HT** | Garst | 2.5 | — | — | — | — | 105 | 112 | 108 | 107 |
| A 30-06 | PGI Alfalfa | 2.0 | — | — | — | — | 106 | 110 | 108 | 101 |
| **5312** | Check | 3.0 | 108 | 106 | 112 | 108 | 105 | 106 | 105 | 104 |
| **FEAST +EV** | Garst | 2.0 | 114 | 102 | 120 | 111 | 101 | 107 | 104 | — |
| **54H91** | Pioneer | 3.0 | 107 | 100 | 122 | 109 | 104 | 112 | 108 | — |
| 6200HT | Garst | 2.0 | — | — | — | — | — | — | — | 101 |
| WRANGLER | Public | — | 108 | 100 | 101 | 103 | — | — | — | — |
| **DAKOTA** | Great Plains | 3.5 | — | — | — | — | 99 | 107 | 103 | — |
| **VERNAL** | Check | 2.0 | 91 | 97 | 89 | 93 | 98 | 91 | 94 | 98 |
| **ONEIDA VR** | Check | — | 102 | 97 | 99 | 99 | 97 | 103 | 100 | 97 |
| LEGENDAIRY 5.0 | CROPLAN | 3.0 | — | — | — | — | — | — | — | 96 |
| LSD 5% | | | 14 | 8 | 10 | 9 | 9 | 8 | 7 | 11 |

***Table 3. Alfalfa variety yields as a percentage of check varieties at Stearns County, Ottertail County and Grand Rapids (Itasca County) (continued).***

| Variety, in descending order of average performance over all current Minn. Trials. **Bold** varieties have been in Minn. Trials for more than 5 site-years. | Maketer | WSI | Grand Rapids 2003 Seeding, Harvest Years 2005 | 2004 | 2-Year Total | All Site-Years Average |
|---|---|---|---|---|---|---|
| *Checks, Tons/Ac as Hay* | | | *4.3* | *5.5* | *9.9* | *6.7* |
| WL 319 HQ | W-L | 1.5 | — | — | — | 117 |
| WL 348 AP | W-L | 2.0 | — | — | — | 117 |
| PHABULOUS | Trelay | — | — | — | — | 116 |
| WL 327 | W-L | — | — | — | — | 115 |
| ROOT 66 | Trelay | 2.0 | — | — | — | 115 |
| GOLDLEAF | Al. Lea/Gold Co. | 3.0 | — | — | — | 115 |
| DKA33-16 | Monsanto | — | — | — | — | 114 |
| LEGENDAIRY YPQ | CROPLAN | — | 101 | 104 | 103 | 114 |
| POINTER | Dahlco | — | — | — | — | 113 |
| SETTER | Dahlco | — | 104 | 108 | 106 | 113 |
| **IGNITE** | Jung | — | — | — | — | 112 |
| VALUE PLUS I | Brown Seed | 3.0 | — | — | — | 112 |
| PERFECT | Grassland | — | — | — | — | 112 |
| **6410** | Garst | 2.5 | — | — | — | 112 |
| PHIRST | BioPlant | — | — | — | — | 112 |
| POWER 4.2 | Power | — | — | — | — | 111 |
| FSG 351 | Allied | — | — | — | — | 111 |
| MAXIMUM I | Johnson | — | — | — | — | 111 |
| **GH 711** | Golden Harvest | 2.0 | — | — | — | 110 |
| **HYBRIFORCE-400** | DairyLand | 3.0 | — | — | — | 110 |
| **6420** | Garst | — | — | — | — | 109 |
| **PHABULOUS II** | Trelay | — | — | — | — | 109 |
| NOTICE II | Channel | — | — | — | — | 109 |
| **6415** | Garst | 2.0 | — | — | — | 109 |
| **MILK RIVER** | R.J. Hunt | — | — | — | — | 108 |
| REBOUND 5.0 | CROPLAN | 2.5 | — | — | — | 108 |
| FSG 408DP | Allied | — | — | — | — | 108 |
| **9429** | LG | 3.0 | — | — | — | 108 |
| **EXTREME** | LG | — | 95 | 95 | 95 | 108 |
| **54V46** | Pioneer | 3.0 | 101 | 109 | 105 | 107 |
| **HYBRIFORCE-420/WET** | DairyLand | 3.0 | 103 | 104 | 103 | 107 |
| LIGHTNING III | Jung | 2.5 | — | — | — | 106 |
| **SOMERSET** | Syngenta | 2.5 | 95 | 105 | 101 | 106 |
| **620** | Garst | 2.5 | 102 | 99 | 100 | 106 |
| **54Q25** | Pioneer | — | 106 | 100 | 103 | 105 |
| **AMERISTAND 403T** | Am. Alf. | 2.0 | 97 | 99 | 98 | 105 |
| BOBWHITE | NC+ | — | — | — | — | 104 |
| ABUNDANCE | Ziller | 3.5 | — | — | — | 104 |
| **6400HT** | Garst | 2.5 | — | — | — | 104 |
| A 30-06 | PGI Alfalfa | 2.0 | 108 | 94 | 100 | 104 |
| **5312** | Check | 3.0 | 98 | 98 | 98 | 103 |
| **FEAST +EV** | Garst | 2.0 | 96 | 83 | 89 | 103 |
| **54H91** | Pioneer | 3.0 | 98 | 96 | 97 | 102 |
| 6200HT | Garst | 2.0 | — | — | — | 100 |
| WRANGLER | Public | — | — | — | — | 100 |
| **DAKOTA** | Great Plains | 3.5 | — | — | — | 100 |
| **VERNAL** | Check | 2.0 | 96 | 93 | 94 | 98 |
| **ONEIDA VR** | Check | — | 106 | 109 | 108 | 98 |
| LEGENDAIRY 5.0 | CROPLAN | 3.0 | — | — | — | 97 |
| LSD 5% | | | 7 | 15 | 9 | |

***Table 4. Alfalfa variety yields as a percentage of check varieties at Rosemount, Lamberton and Stearns County.***

| Variety, in descending order of average performance over all current Minn. Trials. **Bold** varieties have been in Minn. Trials for more than 5 site-years. | Marketer | WSI | Rosemount 2005 Seeding, Harvest Year 2005 | Lamberton 2005 Seeding, Harvest Year 2005 | Stearns County 2005 Seeding, Harvest Year 2005 | All Site-Years Average |
|---|---|---|---|---|---|---|
| *Checks, Tons/Ac as Hay* | | | *4.1* | *1.7* | *3.6* | *3.1* |
| WL 348 AP | W-L | 2.0 | 111 | — | — | 111 |
| L-311 | Legacy | — | 109 | — | — | 109 |
| 4S419 | DairyLand | — | 113 | 102 | 105 | 107 |
| LABRADOR | Dahlco | — | — | — | 104 | 104 |
| **5312** | Check | 3.0 | 102 | 104 | 103 | 103 |
| STAMPEDE | Al. Lea /Allied | — | 103 | — | — | 103 |
| **6420** | Garst | — | 106 | 96 | 105 | 103 |
| 6200HT | Garst | 2.0 | — | — | 102 | 102 |
| VIKING 357 | Al.Lea/Leg.Seed | — | 101 | — | — | 101 |
| CW 15030 | Allied | — | 101 | — | — | 101 |
| **6400HT** | Garst | 2.5 | 111 | 90 | 98 | 100 |
| 4R429 | Mycogen | 4.0 | — | — | 99 | 99 |
| GOLDLEAF | Al. Lea/ Gold Co. | 3.0 | 99 | — | — | 99 |
| ENFORCER | Allied | — | 99 | — | — | 99 |
| **54V46** | Pioneer | 3.0 | 106 | 92 | 98 | 99 |
| **VERNAL** | Check | 2.0 | 97 | 101 | 98 | 99 |
| **ONEIDA VR** | Check | — | 101 | 94 | 100 | 98 |
| MARVEL | Allied | — | 98 | — | — | 98 |
| BARALFA 42 IQ | Barenbrug | 2.0 | 97 | — | — | 97 |
| 53Q30 | Pioneer | — | 104 | 93 | 94 | 97 |
| DKA33-16 | Monsanto | — | — | — | 96 | 96 |
| **6415** | Garst | 2.0 | 93 | 100 | 94 | 96 |
| INTEGRITY | Am. Alf. | — | 105 | 85 | — | 95 |
| 8630 | Mallard | — | 102 | 87 | 92 | 94 |
| REBOUND 5.0 | CROPLAN | 2.5 | — | 93 | — | 93 |
| WL 357 HQ | W-L | 2.0 | — | 85 | 98 | 92 |
| **SOMERSET** | Syngenta | 2.5 | — | — | 92 | 92 |
| LEGENDAIRY 5.0 | CROPLAN | 3.0 | — | — | 89 | 89 |
| GENOA | Syngenta | 2.0 | — | 79 | 96 | 88 |
| LSD 5% | | | 11 | 17 | 11 | |

***Table 5. 2005 Winter survival test results from Minnesota, South Dakota and Wisconsin. Planted spring 2004 and rated spring 2005.***

| | Winter Survival Index * | | | | |
|---|---|---|---|---|---|
| Variety | Rosemount, MN | South Shore, SD | Arlington, WI | Lancaster, WI | Mean |
| ZG 9830 | 1.5 | 2.0 | 1.9 | 1.8 | 2.0 |
| 5262 | 2.2 | 2.1 | 2.1 | 2.3 | 2.0 |
| WL 348 AP | 2.4 | 2.4 | 1.7 | 2.5 | 2.5 |
| 53V52 | 2.2 | 2.5 | 2.2 | 2.2 | 2.5 |
| 6415 | 2.8 | 2.2 | 2.0 | 2.4 | 2.5 |
| 6200HT | 2.7 | 2.3 | 2.4 | 2.4 | 2.5 |
| WL 325 HQ | 2.7 | 2.7 | 2.1 | 2.5 | 2.5 |
| 54V46 | 2.8 | 2.4 | 2.5 | 2.7 | 2.5 |
| AMERISTAND 404LH | 2.8 | 2.3 | 2.7 | 2.8 | 2.5 |
| REBOUND 5.0 | 3.3 | 2.6 | 2.5 | 2.3 | 2.5 |
| LEGENDAIRY 5.0 | 3.7 | 2.1 | 2.2 | 2.8 | 2.5 |
| WL 316 | 4.0 | 3.4 | 4.2 | 3.5 | 4.0 |
| 4R429 | 4.3 | 3.9 | 3.4 | 3.9 | 4.0 |
| ARCHER | 3.9 | 4.2 | 4.5 | 4.3 | 4.0 |
| CUF 101 | 6.0 | 6.0 | 5.8 | 6.0 | 6.0 |

* Winter survival index: 1 = superior winter survival, 2 = very good, 3 = good, 4 = adequate, 5 = low, 6 = no winter survival.

***Table 6a. Alfalfa variety dry matter yield, milk production (expressed as percent of Vernal), RFQ index, CP and NDF (% dry matter), NDFD (% NDF); 2005 season totals[a] and weighted averages from a trial seeded in 2004 at Rosemount, MN.***

| Variety, listed in descending order of milk production. | DM Yield | Milk, (%)[b] | | RFQ[c] | CP[c], | NDF[c], | NDFD[d], |
|---|---|---|---|---|---|---|---|
| | Tons/DM Acre | Lb/Acre | Lb/Ton | Index | % DM | % DM | % NDF |
| 6415 | 5.7 | 108 | 105 | 189 | 20.4 | 36 | 51 |
| 54Q25 | 5.7 | 108 | 105 | 187 | 20.5 | 37 | 52 |
| 4A421 | 5.7 | 107 | 105 | 188 | 21.4 | 36 | 51 |
| SUMMERGOLD | 5.7 | 106 | 104 | 185 | 20.9 | 37 | 50 |
| LEGENDAIRY 5.0 | 5.3 | 101 | 107 | 195 | 21.5 | 35 | 52 |
| VERNAL | 5.6 | 100 | 100 | 172 | 19.9 | 39 | 51 |
| CIMARRON | 5.4 | 100 | 102 | 179 | 20.7 | 37 | 50 |
| 6200HT | 5.5 | 99 | 101 | 176 | 21.0 | 38 | 50 |
| 6400HT | 5.2 | 96 | 103 | 185 | 21.2 | 36 | 50 |
| WL 322 HQ | 5.1 | 95 | 102 | 181 | 20.9 | 37 | 51 |
| 4R429 | 5.0 | 92 | 101 | 175 | 20.2 | 38 | 49 |
| Vernal, actual values | 5.6 | 15,505 | 2,775 | 172 | 19.9 | 39 | 51 |
| Mean | 5.4 | 101 | 103 | 183 | 20.8 | 37 | 51 |
| LSD (0.05) | ns | ns | 4 | 12 | 0.7 | 2 | ns |

[a] Three harvests total in the season.
[b] Milk production (pounds milk per acre and ton) are based on spreadsheet MILK2000, Univ. of WI.
[c] RFQ = relative forage quality; CP = crude protein; and NDF = neutral detergent fiber concentration.
[d] NDFD = neutral detergent fiber digestibility.

***Table 6b. Alfalfa variety dry matter yield, milk production (expressed as percent of Vernal), RFQ index, CP and NDF (% dry matter), NDFD (% NDF); 2005 values from a late summer cut, trial seeded in spring 2005 at Rosemount, MN.***

| Variety listed in descending order of milk production. | DM Yield | Milk, (%)[a] | | RFQ[b] | CP[b], | NDF[b], | NDFD[c], |
|---|---|---|---|---|---|---|---|
| | Ton/ Acre | Lb/ Acre | Lb/ Ton | Index | % DM | % DM | % NDF |
| WL 322 HQ | 1.9 | 110 | 106 | 202 | 24.2 | 34 | 52 |
| CIMARRON | 2.0 | 110 | 103 | 188 | 23.5 | 36 | 51 |
| 53Q30 | 1.9 | 109 | 106 | 195 | 22.9 | 35 | 52 |
| 6415 | 1.9 | 108 | 107 | 201 | 23.2 | 34 | 52 |
| VERNAL | 1.8 | 100 | 100 | 180 | 22.8 | 37 | 52 |
| Vernal, actual values | 1.8 | 5,108 | 2,791 | 180 | 22.8 | 37 | 52 |
| Mean | 1.9 | 106 | 105 | 196 | 23.4 | 35 | 52 |
| LSD (0.05) | ns | ns | 4 | 13 | 0.7 | 2 | ns |

[a] Milk production (pounds milk per acre and ton) are based on spreadsheet MILK2000, Univ. of WI.
[b] RFQ = relative forage quality; CP = crude protein; and NDF = neutral detergent fiber concentration.
[c] NDFD = neutral detergent fiber digestibility.

**Table 7. Regional Potato Leafhopper-Tolerant Alfalfa Trial, 2005 Yields.**

Conducted in Iowa and Ohio, seeded spring 2005.

*The PLH Yield Index is based on harvests where PLH numbers exceed economic thresholds for non-resistant varieties.*

| | Average Yield At Two Locations, Tons Dry Matter/Acre | | | PLH Yield Index, % Above | | Yield Tested |
|---|---|---|---|---|---|---|
| PLH-Resistant Varieties | Harvest 1 | Harvest 2 | Total | Susc. Checks | WSI | In MN? |
| FG 43H173 | 1.01 | 0.93 | 1.94 | 61* | NA | No |
| 54H91 | 0.99 | 0.82 | 1.81 | 50* | 3.0 | Yes |
| WL347LH | 0.89 | 0.81 | 1.70 | 41* | NA | No |
| FG 43H175 | 0.86 | 0.76 | 1.61 | 34* | NA | No |
| Enforcer | 0.84 | 0.76 | 1.60 | 33* | NA | Yes |
| FSG 400LH | 0.79 | 0.80 | 1.58 | 31* | NA | Yes |
| FG 43H178 | 0.75 | 0.72 | 1.47 | 22 | NA | No |
| Bluebird HR | 0.69 | 0.75 | 1.44 | 20 | NA | No |
| WL345LH | 0.68 | 0.70 | 1.38 | 15 | NA | No |
| 6325 | 0.54 | 0.59 | 1.12 | -6 | NA | No |
| Checks | | | | | | |
| DK140 | 0.71 | 0.69 | 1.41 | 17 | 3.0 | Yes |
| 5454 | 0.53 | 0.64 | 1.18 | -2 | 2.5 | Yes |
| Vernal | 0.47 | 0.54 | 1.01 | -16 | 2.0 | Yes |
| PLH Variety Mean | 0.80 | 0.76 | 1.56 | | | |
| Check Variety Mean | 0.50 | 0.59 | 1.09 | | | |
| LSD | 0.20 | 0.16 | 0.34 | | | |

* Significantly greater (P>.05) than the checks.

***Table 8. 2005 forage seed sources.***

| | Company | City | State | Zip | Phone (Main) | Phone (other) | Web URL/access? |
|---|---|---|---|---|---|---|---|
| AgVenture | AgVenture East | Kasson | MN | 55944 | 800-657-4890 | | www.agventure.com |
| Albert Lea | Albert Lea Seed House | Albert Lea | MN | 56007 | 507-373-3161 | | www.alseed.com |
| Allied | Allied Seed | Macon | MO | 63552 | 800-880-8127 | | www.alliedseed.com |
| Am. Alf. | America's Alfalfa | Princeton | IL | 61356 | 800-873-2532 | | www.americasalfalfa.com |
| AMPAC | AMPAC Seed Co. | Winona Lake | IN | 46590 | 866-311-4869 | | www.ampacseed.com |
| Barenburg | Barenburg Midwest | Vinton | IA | 52349 | 888-470-5569 | 800-547-4101 | www.barusa.com |
| Bio Plant | Bio Plant Research | Camp Point | IL | 62320 | 800-593-7708 | | |
| Brown Seed | Brown Seed Farms | Bay City | WI | 54723 | 800-712-7696 | 715-262-4331 | www.browngenetics.com |
| Channel Bio | Channel Bio Corp | Kentland | IN | 47951 | 800-369-8218 | | www.channelbio.com |
| Croplan | CROPLAN Genetics | St. Paul | MN | 55164 | 800-851-8810 | 651-634-8105 | www.croplangenetics.com |
| Dahlco | Dahlco Seed | Cokato | MN | 55321 | 320-286-5982 | | www.dahlco.com |
| Dairyland | Dairyland Seed Co. | West Bend | WI | 53095 | 800-236-0163 | | www.dairylandseed.com |
| Elk Mound | Elk Mound Feed & Farm Supply | Elk Mound | WI | 54739 | 715-879-5556 | | www.elkmoundseed.com |
| Garst | Garst Seed Co. | Dawson | MN | 56232 | 320-769-4445 | 608-452-3844 | www.garstseed.com |
| Geertson | Geertson Seed Farm | Adrian | OR | 97901 | 800-843-0390 | | |
| Gold Country | Gold Country Seed | Hutchinson | MN | 55350 | 320-587-1050 | | www.goldcountryseed.com |
| Grassland | Grassland Central | Jordan | MN | 55352 | 952-492-2990 | | |
| Great Lakes | Great Lakes Hybrids | Ovid | MI | 48866 | 989-834-2251 | | www.glh-seeds.com |
| Great Plains | Great Plains Research Co. Inc. | Apex | NC | 27539 | 919-362-1583 | | www.greatplainsresearch.com |
| Golden Harvest | JC Robinson Seeds/ Golden Harvest | Sherburne | MN | 56171 | 507-764-3640 | 402-289-0245, 612-565-2945 | www.goldenharvestseeds.com |

*Table 8. 2005 forage seed sources (continued).*

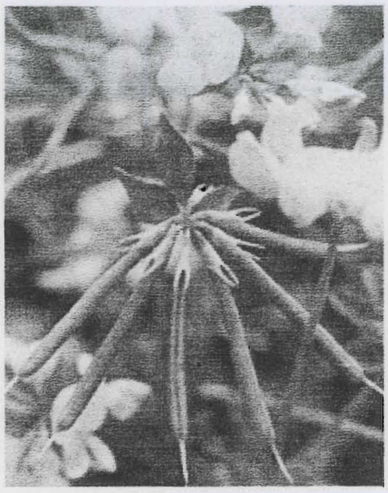
| | Company | City | State | Zip | Phone (Main) | Phone (other) | Web URL/access? |
|---|---|---|---|---|---|---|---|
| Johnson | Johnson Seeds | Dassel | MN | 55325 | 320-275-2430 | | www.seed.ab.ca/grower/Johnson |
| Jung | Jung Seed Genetics | Eyota | MN | 55934 | 507-545-0151 | 800-242-1855 | www.jungseedgenetics.com |
| Kaltenberg | Kaltenberg Seed Farms | Waunakee | WI | 53597 | 800-383-3276 | | www.kaltenburgseeds.com |
| KayStar | KayStar Seeds | Huron | SD | 57350 | 605-352-8791 | | www.kaystarseed.com |
| La Crosse | La Crosse Forage & Turf Seed Co. | LaCrosse | WI | 54603 | 608-783-9560 | | |
| Legacy | Legacy Seeds, Inc. | Waupaca | WI | 54981 | 866-791-6390 | | www.legacyseeds.com |
| Legend | Legend Seeds | DeSmet | SD | 57231 | 605-854-3346 | | www.legendseeds.com |
| LG Seeds | LG Seeds | Sauk Rapids | MN | 56379 | 320-248-0042 | 715-426-7577 | www.lgseeds.com |
| Mallard | Mallard Seed | Plainview | MN | 55964 | 507-534-2300 | | |
| Monsanto | Monsanto Global Seed Group | St Louis | MO | 63167 | 314-694-5701 | | www.monsanto.com |
| Mycogen | Mycogen Seeds | Holmen | WI | 54636 | 608-526-2627 | 317-337-4007 | www.mycogen.com |
| NC+ | NC+ Hybrids | Spencer | IA | 51301 | 712-262-9216 | 402-467-2517 | www.nc-plus.com |
| North-Gro | North-Gro Seeds | Cuba City | WI | 53807 | 608-744-7333 | | www.northgro.com |
| Olds Seed | Olds Seed Solutions | Madison | WI | 53707 | 800-356-7333 | 608-249-9291 | seedsolutions.com |
| PGI Alfalfa | PGI Alfalfa Inc. | Story City | IA | 50248 | 800-247-3967 | 515-733-5274 | |
| Pioneer | Pioneer Hi-Bred Int'l Inc. | Johnston | IA | 50131 | 515-334-6426 | | www.pioneer.com |
| Power | Power Seeds Inc. | Fraserville | ONT CAN K0L 1V0 | | 705-944-5600 | | |
| Producers | Producers Hybrids, Inc. | Battle Creek | NE | 68715 | 888.675.3190 | | www.producershybrids.com |
| R.J. Hunt | R.J. Hunt Seed Co. | Wadena | MN | 56482 | 218-631-4190 | | |
| Ramy | Ramy International | Mankato | MN | 56001 | 800-658-7269 | | |
| Renk | Renk Seed Co. | Sun Prairie | WI | 53590 | 800-289-7365 | 608-837-7351 | www.renkseed.com |
| Spangler | Spangler Seedtech Inc | Jefferson | WI | 53549 | 800-284-1080 | 414-674-4606 | www.spanglerseed.com |
| Specialty | Specialty Seeds | Cold Spring | MN | 56307 | 320-845-7689 | | www.specialtyseedsalbany.com |
| Syngenta | Syngenta Seeds Inc. | Golden Valley | MN | 55427 | 763-593-7286 | | www.syngenta.com |
| Target | Target Seed, LLC | Homesdale | ID | 83628 | 208-337-6201 | | www.targetseed.com |
| Trelay Inc. | Trelay Inc. | Livingston | WI | 53554 | 608-943-6363 | | www.trelay.com |
| Wensman | Wensman | Wadena | MN | 56482 | 218-631-2954 | 218-631-4195 | |
| W-L | W-L Research, Inc. | Madison | WI | 53708 | 800-406-7662 | 608-240-0630 | www.wlresearch.com |
| Ziller | Ziller Seed Co. Inc. | Bird Island | MN | 55310 | 320-365-3674 | | www.zillerseed.com |
| U of MN | Univ. of Minn. Forages | Saint Paul | MN | 55108 | | | http://forages.coafes.umn.edu |

Minnesota Agricultural Experiment Station
University of Minnesota

# Birdsfoot Trefoil

N.J. Ehlke and D.J. Vellekson

## Varietal Trials Results, January 2006



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

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

New releases, Steadfast, a rhizomatous birdsfoot trefoil from Missouri, and Pardee, from Cornell, were 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, generally produce the highest consistent overall yields. Norcen, released in 1983 by the agricultural experiment stations of Minnesota and six other states, has performed exceptionally well in grazing trials.

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

| | Winter Injury* | | Rosemount | | | Grand Rapids | |
|---|---|---|---|---|---|---|---|
| Variety | 05/24/04 | 1998 | 1999-2001 | 2002 | 2004-2005 | 1999-2001 | 2002-2004 |
| Bright | — | 3.6 | 3.1 | — | — | — | — |
| Dawn | 1.0 | 4.0 | 3.8 | 4.0 | 4.5 | 4.8 | 2.1 |
| Empire | — | 4.0 | — | — | — | 4.4 | — |
| Fergus | — | 3.9 | — | — | — | — | — |
| Georgia | — | — | 3.6 | — | — | 4.6 | 1.8 |
| Leo | — | 3.9 | 3.1 | — | — | — | — |
| Norcen | 1.0 | 4.3 | 3.5 | 3.9 | 4.2 | 4.8 | 2.1 |
| Nueltin | 1.0 | 3.7 | 3.1 | 4.0 | 3.6 | 4.2 | 2.2 |
| Pardee | 8.3 | — | — | 3.5 | 0.2 | — | 1.9 |
| Roseau | 2.5 | 4.1 | 3.4 | 4.1 | 3.5 | 4.6 | 2.1 |
| Steadfast | — | 3.1 | 2.7 | — | — | 3.5 | — |
| Trevig | — | 4.1 | — | 4.2 | — | — | — |
| Viking | 1.8 | 3.8 | 3.6 | 4.0 | 4.0 | 4.4 | 2.1 |
| Witt | — | 4.0 | 3.2 | 4.1 | — | — | 2.0 |
| LSD 5% | 0.9 | 0.5 | 0.3 | 0.4 | 0.3 | 0.5 | 0.2 |

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

***Seed Sources for Forage Plots, pages 15-23.***

| | | |
|---|---|---|
| **Deer Creek Seed,** | PO Box 105, Ashland, WI 54806 | 877-247-3736 |
| **Pickseed,** | Box 304 1 Greenfield Rd., Lindsay, ON K9V 4S3 | 800-268-2806 |
| **Norfarm Seed,** | RR 2 Box 37, Roseau, MN 56751 | 218-463-3531 |
| **Etheridge Farm,** | 1950 Lane 11, Powell, WY 82435 | 307-754-2371 |
| **Allied Seed,** | 9311 Hwy 45 Lane, Nampa, ID 83686 | 888-252-7573 |
| **Brett Young LTD,** | PO Box 99, St. Norbert PS, Winnipeg, MB R3V 1L5 | 800-665-5015 |
| **Wrightson LTD,** | PO Box 50240, Porirua, New Zealand | 64 4 49183335 |
| **Agri Pro,** | PO Box 30, Berthoud, CO 80513 | 877-943-2827 |
| **Cascade Seed,** | 1406 E. Front Ave., Spokane, WA 99220 | 509-534-9431 |
| **Pure Seed Testing,** | 6875S Whiskey Hill Rd., Hubbard, OR 97032 | 503-263-0742 |
| **Twin City Seed,** | 7265 Washington Ave. S., Edina, MN 55439 | 952-944-7105 |
| **General Feed and Grain,** | 7128 3rd. St., Bonners Ferry, ID 83805 | 208-267-3185 |
| **Geertson Seed,** | 1665 Burroughs Rd., Adrian, OR 97901 | 800-843-0390 |

### *Birdsfoot Trefoil Planting Rate and Date*

Bushel Weight, Pounds..... 65

Seeds/Pound..... 372,000

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

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

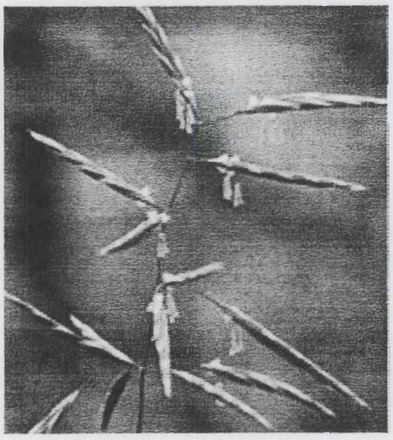
Planting Date.... Early Spring or Summer

Minnesota Agricultural Experiment Station
University of Minnesota

# Bromegrass

N.J. Ehlke and D.J. Vellekson

## Varietal Trials Results, January 2006



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. Overgrazing also will reduce stands.

Varieties are generally evaluated in pure stands at Minnesota experiment stations with a three-cut harvest system. Nitrogen is applied at all locations in early spring and after the first two harvests at a rate of 50 pounds per acre for each application. Dry matter yields have generally varied little among varieties. At Rosemount in 1999 stand losses occurred after the first harvest in all varieties except York.

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

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

* Data in the table are the most recent available.

### *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 |

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# Cicer Milkvetch

N.J. Ehlke and D.J. Vellekson

Varietal Trials Results, January 2006

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

Hi Pal, a variety developed at Minnesota AES, was selected for plant vigor and palatability under grazing.

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

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

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

***Cicer Milkvetch Planting Rate and Date***

Bushel Weight, Pounds.....60

Seeds/Pound.....122,000

Planting Rate, Pounds/Acre

Alone.....16

Planting Rate, Seeds/Sq. Ft.

Alone.....50

Planting Date..... Early Spring or Summer

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# Kura Clover

N.J. Ehlke and D.J. Vellekson

## Varietal Trials Results, January 2006

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

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

Summary tables include variety trials seeded in 1999 and 2002 at Rosemount and in 2002 at Grand Rapids. Thirty pounds of nitrogen was applied at time of seeding to assist early growth, and is recommended for initial stand establishment. Trials were harvested three times per year at Rosemount and twice per year at Grand Rapids.

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

| | Vigor* | Rosemount | | Grand Rapids |
|---|---|---|---|---|
| Variety | 05/01/03 | 2001-2002 | 2003-2005 | 2003-2004 |
| Cossack | 6.0 | 4.4 | 4.1 | 1.1 |
| Endura | 3.3 | 4.3 | 4.8 | 1.2 |
| NF-93 C2 | 5.5 | 4.6 | 4.7 | 0.9 |
| Rhizo | 2.8 | 4.1 | 4.0 | 0.8 |
| LSD 5% | 1.0 | 0.5 | 0.5 | 0.1 |

* Vigor, Rosemount; 1 = least, 9 = best.

### *Kura Clover Planting Rate and Date*

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

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# Orchardgrass

N.J. Ehlke and D.J. Vellekson

Varietal Trials Results, January 2006

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 for many years in areas with reliable snow cover.

Orchardgrass varieties were established in pure stands in 1997,1998 and 2002 at Rosemount and in 1998 and 2002 at Grand Rapids.

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

***Orchardgrass Planting Rate and Date***

Bushel Weight, Pounds.....14

Seeds/Pound.....653,000

Planting Rate, Pounds/Acre

Alone.....10

In Mixtures.....3

Planting Rate, Seeds/Sq. Ft.

Alone.....150

In Mixtures.....45

Planting Date

Alone..Early Spring or Late Summer

In Mixtures.....Use Date for Legume

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

| | Winter Injury* | Rosemount | | | Grand Rapids | | |
|---|---|---|---|---|---|---|---|
| Variety | 05/01/03 | 1998-2000 | 1999-2002 | 2003-2005 | 1990-1994 | 1999-2001 | 2004-2005 |
| AC Nordic | — | — | 3.4 | — | — | 3.7 | — |
| Albert | — | — | — | — | — | 3.9 | — |
| Ambassador | — | 4.4 | — | — | 3.5 | 3.6 | — |
| Bengal | — | — | 3.5 | — | — | — | — |
| Condor | — | 4.5 | — | — | — | 3.8 | — |
| Crown | — | 4.5 | — | — | 3.5 | — | — |
| Dawn | — | — | — | — | 3.6 | — | — |
| Duke | 2.8 | 4.8 | 3.5 | 3.7 | — | 3.8 | 1.6 |
| Elsie | — | — | 3.4 | — | 3.5 | 3.5 | — |
| Extend | 4.5 | | — | 3.6 | — | — | 1.6 |
| Haymate | — | 4.5 | — | — | — | 3.7 | — |
| Hawkeye | 4 | — | 3.8 | 3.8 | — | 3.9 | 1.6 |
| Justus | 4 | 4.5 | 3.5 | 3.4 | 3.4 | 3.4 | 1.5 |
| Megabite | 3.5 | — | 3.8 | 3.8 | — | 3.7 | 1.7 |
| Mammoth | — | — | 3.7 | — | — | — | — |
| Napier | — | 4.3 | — | — | 3.6 | — | — |
| Orbit | — | 3.6 | — | — | 3.4 | — | — |
| Orion | 3.8 | 4.7 | 3.7 | 3.5 | 3.7 | 4.1 | 1.4 |
| Potomac | 2.8 | 4.4 | 3.3 | 3.8 | 3.5 | — | 1.3 |
| Shawnee | — | — | — | — | — | 3.0 | — |
| Sterling | — | — | — | — | 3.4 | — | — |
| Warrior | 4.5 | — | 3.5 | 3.4 | — | — | 1.5 |
| LSD 5% | 1.5 | 0.4 | 0.2 | NS | NS | 0.4 | NS |

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

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# Red Clover

N.J. Ehlke and D.J. Vellekson

## Varietal Trials Results, January 2006

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

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

Experimental varietal trial plots were established at Grand Rapids in 1998, 1999 and 2001 and at Rosemount in 1996, 1999 and 2002.

Harvest frequency is generally three times per year. Winter injury in 2003-2004 at Rosemount was quite severe, with all varieties injured to some degree. Varietal differences were observed; ratings in the table should give some indication as to winterhardiness in the second production year.

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

### *Red Clover Planting Rate and Date*

Bushel Weight, Pounds.....65
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 Mixtures...Use Date for Legume

***Dry matter yield, in tons per acre, of red clover varieties seeded at two locations.****

| | Potato Leafhopper Injury** | Winter Injury*** | Rosemount | | | Grand Rapids | | |
|---|---|---|---|---|---|---|---|---|
| Variety | 07/14/03 | 05/24/04 | 1997-1998 | 2000 | 2003 | 1999-2001 | 2000-2001 | 2003-2004 |
| Arlington | 3.5 | 6.5 | 4.1 | 5.2 | 3.6 | 2.9 | 3.0 | 1.2 |
| Astred | — | — | 2.8 | — | — | — | — | — |
| Cinnamon | — | — | 4.5 | — | — | — | — | — |
| Cinnamon Plus | 2.3 | 7.5 | — | — | 4.2 | — | — | 1.3 |
| Freedom | 4.8 | 8.5 | — | 5.5 | 3.7 | — | 3.2 | 1.2 |
| Juliette (mcc176) | 3 | 6.3 | — | 5.6 | 4.0 | 3.5 | 3.3 | 1.3 |
| Marathon | 1.5 | 5 | 4.0 | 5.6 | 4.3 | 3.4 | 3.2 | 1.4 |
| Prima | — | — | — | 5.3 | — | 3.4 | 3.5 | — |
| Randolph | — | — | 4.1 | — | — | 3.5 | — | — |
| Redland III | — | — | — | — | — | — | — | — |
| Redlan GrazeII | 1.3 | 8 | — | — | 4.3 | — | — | 1.5 |
| Redstar | — | — | — | 5.9 | — | — | 3.4 | — |
| Scarlett | 1.3 | 5.3 | 4.2 | — | 4.0 | 3.4 | — | 1.4 |
| LSD 5% | 0.9 | 1.4 | 0.6 | 0.6 | 0.3 | 0.2 | 0.3 | 0.2 |

* Data in the table are the most recent available.
** Potato leafhopper injury from Rosemount, 5 = worst
*** Winter injury, Rosemount; 1 = no injury; 9 = dead.

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# Reed Canarygrass

N.J. Ehlke and D.J. Vellekson

## Varietal Trials Results, January 2006

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. While reed canarygrass utilizes nitrogen efficiently and is adapted to liquid manure application, its seedling vigor is not as good as that of other commonly grown forage grasses.

The most recent developments in reed canarygrass breeding have been the release of varieties low in indole alkaloid concentrations. Animal performance and palatability are dramatically improved when these varieties are grazed.

Alkaloids are bitter, complex, nitrogen containing anti-quality compounds.

In grazing trials, lambs and steers performed better 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 varieties is winterhardy and persistent in Minnesota.

Trials were established in pure stands in 1993 at Grand Rapids and Rosemount. Trials also were established in 1999 and 2002 at Rosemount and Grand Rapids. Trials are generally harvested three times per year at Rosemount and two times at Grand Rapids. Nitrogen was applied early in the spring and after the first two harvests at a rate of 50 pounds per acre per application.

### *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

***Dry matter yield, in tons per acre, of reed canarygrass varieties seeded at two locations.***

| | | Rosemount | | | Grand Rapids | | |
|---|---|---|---|---|---|---|---|
| Variety | Vigor* 05/01/03 | 1994-1996 | 2000-2002 | 2003-2005 | 1994-1996 | 2000-2002 | 2003-2005 |
| Chiefton | 6.5 | — | 3.7 | 5.3 | — | 4.9 | 1.7 |
| Lara | — | 3.0 | — | — | — | — | — |
| Marathon | 6.5 | — | — | 5.1 | | — | 1.6 |
| Palaton | 5.3 | 3.1 | 3.8 | 5.1 | 3.5 | 4.8 | 1.6 |
| Rival | 5.0 | — | 3.8 | 4.9 | — | 4.6 | 1.6 |
| Vantage | 3.0 | 3.3 | 3.7 | 5.2 | 3.3 | 5.1 | 1.7 |
| Venture | 6.0 | 3.1 | 3.9 | 5.0 | 3.5 | 5.1 | 1.6 |
| LSD 5% | 0.5 | NS | NS | 0.3 | NS | .4 | NS |

* Vigor, Rosemount; 1 = least, 9 = best.

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# Tall Fescue

N.J. Ehlke and D.J. Vellekson

Varietal Trials Results, January 2006

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. While subject to winter injury, tall fescue 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 especially suitable for growing in the Western Great Plains area of the United States. Wheatgrasses can produce excellent forage yields and sustained productivity under hay and pasture management systems either in monoculture or yield and quality.

***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, in tons per acre, of tall fescue, wheatgrass and festuca-lolium hybrids seeded at three locations.****

| | Grand Rapids | | Rosemount | | Morris |
|---|---|---|---|---|---|
| Variety | 1994-1996 | 1999-2001 | 1993-1995 | 1998-2000 | 1993-1996 |
| Tall Fescue: | | | | | |
| Barcel | 3.0 | — | 5.3 | — | 4.5 |
| Cajun | — | 4.9 | — | 5.3 | — |
| Fawn | 3.3 | — | 4.9 | — | 5.0 |
| Ky 31 | 3.5 | 4.6 | 5.8 | — | 4.7 |
| Ky 31-endophyte free** | 3.3 | — | 5.6 | 5.9 | 4.9 |
| Martin | 3.6 | 4.9 | 5.3 | 4.8 | 4.7 |
| Maximize | — | 4.6 | — | 5.1 | — |
| Mozark | 3.5 | 4.8 | 5.4 | 5.5 | 4.8 |
| Mustang | 2.7 | 4.3 | 4.7 | 4.9 | — |
| Seine | — | — | — | 5.6 | 4.8 |
| Stef | 3.3 | — | 5.3 | — | — |
| Festuca-Lolium Hybrids: | | | | | |
| Kemal | — | 3.8 | — | 3.3 | — |
| Tandem II | — | 3.8 | — | 3.3 | — |
| Spring Green(WFL-96) | — | — | — | — | — |
| Wheatgrasses: | | | | | |
| Manska | 2.9 | — | 4.0 | — | 4.8 |
| Newhy | 2.7 | — | 3.9 | 4.2 | — |
| Reliant | 3.0 | — | 4.2 | — | 5.0 |
| LSD 5% | 0.5 | 0.6 | 0.6 | 0.4 | NS |

* Data in the table are the most recent available.
** Endophytes: Fungi that invade plant tissues, which reduces forage palatability and animal performance.

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# Timothy

N.J. Ehlke and D.J. Vellekson

## Varietal Trials Results, January 2006

Timothy is adapted throughout Minnesota for use in hay and pasture mixes; it is very winterhardy. When timothy is the major component in hay its stage of maturity affects both yield and quality. Early heading is the preferred time to harvest timothy, which produces the majority of its forage at the first harvest.

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

Late-maturing varieties should not be harvested more than twice during the growing season. They may be more appropriate in mixes with birdsfoot trefoil or red clover.

While 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. Timothy does not normally persist well under heavy grazing pressure.

Varieties in the experiment station timothy trials were established in pure stands in 1992 at Rosemount and at Grand Rapids in 1993. Trials were also established at Rosemount and Grand Rapids in 1999 and 2002. Trials are harvested two or three times per year. Nitrogen was applied at all locations in the early spring and after both first and second harvest at a rate of 50 pounds per acre.

### *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, in tons per acre, of timothy seeded at two locations.***

| | | Rosemount | | | Grand Rapids | | |
|---|---|---|---|---|---|---|---|
| Variety | Heading, % 06/07/04 | 1993-1995 | 2000-2002 | 2003-2005 | 1994-1996 | 2000-2002 | 2003-2005 |
| Early-intermediate maturity: | | | | | | | |
| Aurora | 25 | — | 3.3 | 3.6 | — | 3.3 | 1.8 |
| Climax | 1 | 3.8 | 3.4 | 3.8 | 3.6 | 3.0 | 2.0* |
| Colt | 3.5 | — | 3.7 | 4.0 | — | 3.3 | 1.7 |
| Comtal | 1 | 3.7 | 3 | 3.2 | 3.4 | 2.8 | 1.7 |
| Itasca | 2.5 | — | — | 3.8 | — | — | 2.0* |
| Goliath | — | 3.4 | — | — | 3.4 | — | — |
| Promesse | 1 | — | 3.1 | 3.1 | — | 3.1 | 1.6 |
| Summit | 65 | — | — | 4.1 | — | — | 1.6 |
| Timfor | 1 | 3.8 | — | 3.8 | 3.5 | — | 1.7 |
| Toro | — | 3.9 | — | — | 3.7 | — | — |
| Late maturity: | | | | | | | |
| Heidemij | — | 3.0 | — | — | 3.5 | — | — |
| Hokusen | — | 3.4 | — | — | 3.3 | — | — |
| Motim | — | — | 3.4 | — | — | 2.8 | — |
| LSD 5% | 10 | 0.4 | 0.5 | 0.4 | 0.4 | 0.3 | 0.2 |

* 2004-2005 yields only.

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# Barley

K.P. Smith and E.L. Schiefelbein

## Varietal Trials Results, January 2006

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

### Variety Selection Criteria

Most barley producers in the region grow barley for malt and, therefore, select one of the varieties approved by the American Malting Barley Association (AMBA). The most important industry specifications for making malting grade are grain protein, kernel plumpness and deoxynivalenol (DON), the toxin produced by the *Fusarium* Head Blight (FHB) pathogen. Among those approved varieties, Robust is preferred by industry. Drummond, Lacey, Tradition and Legacy are approved by AMBA and may be purchased for malting. Industry preference for the newer varieties is uncertain at this time. Please consult the AMBA recommended varieties for the most current information at www.ambainc.org.

For most producers the disease FHB and the presence of DON in harvested grain are the two most important factors limiting production of malting barley in the region. The only variety with partial resistance to FHB is MNBrite; however, MNBrite is not approved by AMBA as a malting variety. There are no significant differences among the current malting varieties for resistance to FHB. Descriptions of barley varieties covered by the U.S. Plant Variety Protection Act include a **PVP** designation. When **PVP** is followed by **(94)**, seed of that variety may not be sold by a grower, not even to a relative or neighbor, without express permission of the variety's developer/owner. If the PVP designation is followed by (pending), consider the variety as having PVP (94) protection.

### General-Purpose Varieties

These varieties have been tested three years or more.

**Tradition**–High yielding and medium maturity. Medium lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, long rachilla hairs, and colorless aleurone. Classified as a malting variety by AMBA. Resistant to spot blotch and slightly better net blotch resistance compared to Robust. Developed by Busch-Agricultural Resources Inc. (BARI). Released 2003. **PVP (94)**

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

***Grain yield as a percent of the mean of the varieties in trials from 2003-2005 and 2005 alone.***

| | Crookston | | Morris | | Stephen | St. Paul | | Roseau[3] | State Mean | |
|---|---|---|---|---|---|---|---|---|---|---|
| Variety | 2005 | 3-Year | 2005 | 3-Year | 2-Year[1] | 2005 | 2-Year[2] | 2-Year[1] | 2005 | 3-Year |
| Robust | 89 | 82 | 99 | 94 | 90 | 106 | 104 | 98 | 98 | 92 |
| Stander | 88 | 96 | 114 | 107 | 94 | 97 | 96 | 108 | 100 | 100 |
| MNBrite | 107 | 94 | 95 | 98 | 101 | 108 | 99 | 87 | 104 | 95 |
| Lacey | 96 | 98 | 112 | 114 | 98 | 104 | 104 | 109 | 104 | 104 |
| Drummond | 89 | 99 | 100 | 95 | 95 | 111 | 110 | 103 | 100 | 99 |
| Stellar | 98 | 110 | 67 | 93 | 101 | 85 | 90 | 88 | 83 | 99 |
| Legacy | 98 | 98 | 100 | 96 | 104 | 98 | 104 | 110 | 99 | 101 |
| Tradition | 114 | 111 | 114 | 106 | 105 | 112 | 104 | 107 | 113 | 107 |
| Conlon | 121 | 114 | 99 | 97 | 113 | 79 | 90 | 88 | 100 | 103 |
| LSD (0.05) | 17 | 10 | 35 | 11 | 7 | 12 | 10 | 17 | 12 | 5 |
| Mean, Bu/Acre | 77 | 96 | 60 | 97 | 102 | 90 | 102 | 97 | 76 | 98 |

[1] Only two years of data, 2003 and 2004. [2] Only two years of data, 2004 and 2005. [3] No 2005 data available.

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

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

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

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

## Special-Purpose Varieties

These varieties also are adequately tested three years or more. They have special attributes that differentiate them from general-purpose varieties or are intended for a specific end use.

**Stellar**–Medium yielding and medium maturity. Good lodging resistance and kernel plumpness. Six-rowed, semi-smooth awns, long rachilla hairs, and colorless aleurone. Currently being evaluated in industry brewing test. Not classified as a malting variety by AMBA. Resistant to spot blotch, slightly better net blotch resistance compared to Robust. Released by N.D. AES in 2005. **PVP (94)**

***Characteristics of barley varieties, 2000–2005.***

| Variety | Type | Use | Heading (DAP) | Height (in.) | Lodging (%) | Plump (%) | Protein (%) |
|---|---|---|---|---|---|---|---|
| Robust | 6-row | Malt | 58 | 83 | Med. | 83 | 13.2 |
| Stander | 6-row | Feed | 59 | 85 | Strong | 85 | 12.6 |
| MNBrite | 6-row | Feed | 58 | 83 | Med. | 83 | 14.1 |
| Lacey | 6-row | Malt | 58 | 84 | Strong | 84 | 13.1 |
| Drummond | 6-row | Malt | 58 | 81 | V Strng | 81 | 13.2 |
| Stellar[1] | 6-row | Feed | 60 | 85 | Strong | 85 | 12.8 |
| Legacy | 6-row | Malt | 59 | 77 | Med. | 77 | 12.9 |
| Tradition[2] | 6-row | Malt | 59 | 85 | Med. | 85 | 13.8 |
| Conlon[2] | 2-row | Malt | 60 | 93 | Med. | 93 | 13.6 |
| No. Trials | | | 18 | 18 | 17 | 12 | 14 |

[1] Only two years of plump and protein data, 2000-2001.
[2] Only two years of plump and protein data, 2003-2004.

***Disease reactions[1] of barley varieties, 2001-2004.***

| Variety | FHB | Blotch | Septoria Speckled Leaf Blotch | Spot Blotch | Stem Rust |
|---|---|---|---|---|---|
| Robust | 8 | 8 | 9 | 2 | 1 |
| Excel | 8 | 8 | 9 | 2 | 1 |
| Stander | 9 | 8 | 9 | 2 | 1 |
| MNBrite | 6 | 6 | 9 | 1 | 1 |
| Lacey | 8 | 8 | 9 | 2 | 1 |
| Drummond | 8 | 7 | 9 | 2 | 1 |
| Legacy | 7 | 5 | 9 | 2 | 1 |
| Tradition | 8 | 7 | 9 | 2 | 1 |

[1] Most Resistant = 1, Most Susceptible = 9.

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

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

**Stander**–Medium yield and late maturity. Very good lodging resistance, good kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone, and short stature. Not classified as a malting variety. Resistant to spot blotch. Developed by Minnesota 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

Minnesota Agricultural Experiment Station
University of Minnesota

# Corn Grain

T.R. Hoverstad, D.R. Hicks, G.A. Nelson and S.R. Quiring

## Varietal Trials Results, January 2006

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

### Test Locations

Test zones, locations and maturities follow:

**Southern Zone:** Lamberton, Waseca and Plainview.
*Early Maturity Trial*—103 Relative Maturity (RM) and earlier hybrids.
*Late Maturity Trial*—104 RM and later hybrids.

**Central Zone:** Morris and Rosemount.
*Early Maturity Trial*—95 RM and earlier hybrids.
*Late Maturity Trial*—96 RM and later hybrids.

**Northern Zone:** Staples and Rothsay.

### Testing Procedure

**Entries:** Each seed company could enter up to six hybrids per zone. Entries in each trial were based on the RM provided by the company. The University of Minnesota Corn Testing Committee also could choose and enter hybrids in each test. For this reason, there may be more than six hybrids for a company in a test.

### Presentation of Data

Yields are given for individual locations along with yields and harvest moisture contents averaged across locations for 2005. Reported yields are adjusted to 15.5% grain moisture. Hybrids are ranked within a maturity group by moisture content averaged across locations for 2005.

### Least Significant Difference (LSD)

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

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

***Companies participating in 2005 hybrid corn grain trials.***

| | |
|---|---|
| **AgSource Seeds**, Inc., 1800 L Ave., Nevada, IA 50201 | www.agsourceseeds.com |
| **AgriGold Hybrids**, RR1, Box 203, St. Francisville, IL 62460 | www.agrigold.com |
| **Albert Lea Seed House (Viking Hybrids)**, 1414 W. Main, Albert Lea, MN 56007 | www.alseed.com |
| **Anderson Seeds**, R.R. 3, Box 94, St. Peter, MN 56082 | njandrsn@hickorytech.net |
| **Brown Seed Farms Inc.**, P.O. Box 7, Bay City, WI 54723 | www.brownseed.com |
| **Crows Hybrid Corn Co.**, P.O. Box 157, Kentland, IN 47951 | www.crowshybrid.com |
| **Dahlman Seed Co.**, 73504 200th St., Dassel, MN 55325 | www.dahlmanseed.com |
| **Dairyland Seed Co. Inc. (Stealth)**, Box 958, West Bend, WI 53095 | www.dairylandseed.com |
| **DynaGro**, 221 W. Lake Lansing Rd., 102 E., East Lansing, MI 48823 | www.dyna-groseed.com/dynagro/ |

*Companies participating in 2005 hybrid corn grain trials (continued).*

| | |
|---|---|
| **Epley Bros. Hybrids**, Inc., P.O. Box 310, Shell Rock, IA 50670 | www.epleyseed.com |
| **Farm Advantage**, 1275 Hwy. 69, Belmond, IA 50421 | www.farmadvantage.com |
| **Garst Seed Co.**, 2369 330th St., Box 500, Slater, IA 50244 | www.garstseed.com |
| **Gold Country Seed**, 16506 Hwy. 15 N., Hutchinson, MN 55350-0604 | www.goldcountryseed.com |
| **Hyland Seeds**, 2 Hyland Drive, Blenheim, Ontario, Canada NOP 1A0 | www.hylandseeds.com |
| Jung **Farms Inc.**, 341 S. High St., Randolph, WI 53956 | www.jungseedgenetics.com |
| **Kaltenberg Seeds**, Box 278, Waunakee, WI 53597 | www.kaltenbergseeds.com |
| **Kruger Seed Co.**, 33938 160th St., Dike, IA 50624 | www.krugerseed.com |
| **L.G. Seeds Inc.**, 22827 Shissler Rd., Elmwood IL 61529 | www.lgseeds.com |
| **Legacy Seeds Inc.**, 210 Pine St., Waupaca, WI 54981 | www.legacyseeds.com |
| **Monsanto Co. (Dekalb)**, 800 N Lindbergh Blvd, St Louis, MO 63167 | www.monsanto.com<br>www.dekalb.com<br>www.asgrow.com |
| **Mycogen Seeds**, 9330 Zionsville Rd., Indianapolis, IN 46268 | www.dowagro.com/mycogen/ |
| **NuTech Seed**, 6131 North Fork Rd., Ames, IA 50010 | www.nutechseed.com |
| **Peterson Farms Seed**, 3104 164 Ave S.E., Harwood, ND 58092 | www.petersonfarmsseed.com |
| **Pioneer Hi-Bred Intl.**, 99 Navaho Ave. Suite 101A, Mankato, MN 56001 | www.pioneer.com/usa/ |
| **Proseed Inc.**, 705 E. Brewster, Harvey, ND 58341 | www.proseed.net |
| **Renk Seed Co.**, 6800 Wilburn Rd., Sun Prairie, WI 53590 | www.renkseed.com |
| **Seeds 2000**, Box 200 115 N 3rd St., Breckenridge, MN 56520 | www.seeds2000.net |
| **Trelay, Inc. (High Cycle by Trelay)**, 11623 Hwy. 80, Livingston, WI 53554 | www.trelay.com |
| **Trisler Seed Farms, Inc.**, 3274 E 800 North Rd., Fairmount, IL 61841 | www.trisler.com |
| **Wensman Seed Co.**, Box 190, Wadena, MN 56482 | www.wensmanseed.com |

***Corn Planting Rate and Date***

Bushel Weight, Pounds..... 56

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

Planting Date..... April 15 – May 5

*Individual hybrid corn trial information, 2005.*

| Location | Cooperators | Previous Crop | Planting Date | Harvest Dates |
|---|---|---|---|---|
| Lamberton | Steve Quiring | Soybean | 03-May | 17-Oct |
| Waseca | Tom Hoverstad | Soybean | 03-May | 21-Oct |
| Plainview | Fritz Brietenbach<br>Bruck Ihrke | Soybean | 04-May | 28-Oct |
| Morris | George Nelson | Soybean | 04-May | 15-Oct |
| Rosemount | Jerry Holz | Soybean | 06-May | 25-Oct |
| Staples | Norman Krause | Corn | 16-May | 15-Oct |
| Rothsay | George Nelson<br>Troy Larson | Wheat | 05-May | 27-Oct |

*Early-maturity hybrids, southern locations, 2005.*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at | | | Average Across Locations | |
|---|---|---|---|---|---|---|---|
| | | | Lamberton | Plainview | Waseca | Bu/Acre | % Moisture |
| ***97 and earlier RM hybrids*** | | | | | | | |
| NuTech | NT-3696 RR | 95 | 165 | 233 | 205 | 201 | 16.4 |
| Garst | 8880YG1 | 96 | 206 | 216 | 206 | 209 | 17.0 |
| Renk | RK452LLYGCB | 94 | 186 | 206 | 217 | 203 | 17.0 |
| High Cycle by Trelay | 4G721 | 96 | 167 | 193 | 188 | 182 | 17.0 |
| Epley | E1165RR | 95 | 165 | 213 | 195 | 191 | 17.1 |
| Dahlman | R48-15 | 95 | 169 | 207 | 217 | 198 | 17.1 |
| Viking | 7680 | 95 | 151 | 195 | 210 | 186 | 17.1 |
| Renk | RK488YGCB | 96 | 190 | 214 | 175 | 193 | 17.2 |
| Dahlman | D48-15 | 95 | 174 | 210 | 220 | 201 | 17.2 |
| Gold Country | 94-01 CB | 94 | 197 | 212 | 202 | 204 | 17.2 |
| NuTech | NT-4595 YGCB | 94 | 183 | 209 | 242 | 212 | 17.3 |
| Kaltenberg | K4688Bt | 96 | 190 | 220 | 243 | 217 | 17.4 |
| Anderson Seeds | 797Y | 96 | 192 | 208 | 236 | 212 | 17.5 |
| Dairyland Stealth | 5497 | 97 | 187 | 209 | 248 | 215 | 17.5 |
| Kruger | 9496YGCB | 94 | 192 | 226 | 194 | 204 | 17.5 |
| Viking | BT7293 | 96 | 173 | 207 | 213 | 198 | 17.5 |
| Trisler | T-2280CB | 95 | 192 | 223 | 228 | 214 | 17.6 |
| AgriGold | A6205 Bt | 96 | 189 | 224 | 225 | 213 | 17.6 |
| Crows | 45502 | 97 | 200 | 245 | 181 | 209 | 18.1 |
| Kruger | 2697RR/YGCB | 97 | 183 | 217 | 260 | 220 | 18.1 |
| NuTech | NT-0095 | 94 | 167 | 246 | 261 | 225 | 18.2 |
| ***97 and earlier RM Averages:*** | | | ***182*** | ***216*** | ***217*** | ***205*** | ***17.4*** |
| ***98 to 101 RM Hybrids*** | | | | | | | |
| Kruger | K-1500RR | 100 | 144 | 250 | 232 | 208 | 17.0 |
| High Cycle by Trelay | 7560YGCB | 100 | 206 | 258 | 242 | 236 | 17.4 |
| High Cycle by Trelay | 5B578 | 100 | 199 | 233 | 192 | 208 | 17.5 |
| Viking | A6640 | 100 | 150 | 229 | 244 | 208 | 17.7 |
| AgriGold | A6225BtRR | 98 | 206 | 256 | 221 | 228 | 17.8 |
| LG Seeds | LG2491BtRW | 100 | 197 | 237 | 231 | 222 | 17.9 |
| Gold Country | 100-05CB | 100 | 211 | 243 | 242 | 232 | 17.9 |
| Jung | 6422RR/YGCB | 99 | 192 | 244 | 238 | 225 | 18.0 |
| Pioneer | 38H66 | 98 | 177 | 190 | 215 | 194 | 18.1 |
| Dekalb | DKC50-20 | 100 | 173 | 245 | 231 | 216 | 18.1 |
| Dairyland Stealth | 5201 | 101 | 210 | 250 | 234 | 231 | 18.1 |
| High Cycle by Trelay | 5P947 | 100 | 159 | 249 | 228 | 212 | 18.2 |
| NuTech | NT-3999 RR | 99 | 140 | 221 | 188 | 183 | 18.3 |
| Trisler | T-2420CB | 99 | 160 | 246 | 241 | 216 | 18.3 |
| Kruger | 4501RR/YGRW | 101 | 199 | 235 | 238 | 224 | 18.3 |
| Farm Advantage | 4500 | 100 | 172 | 213 | 232 | 206 | 18.4 |
| Garst | 8748YG1 | 101 | 187 | 243 | 239 | 223 | 18.4 |
| NuTech | NT-4000 YGCB | 99 | 176 | 230 | 235 | 214 | 18.5 |
| Anderson Seeds | 6061 | 99 | 168 | 212 | 195 | 192 | 18.5 |
| Garst | 8770YG1 | 99 | 191 | 233 | 247 | 224 | 18.6 |

*Early-maturity hybrids, southern locations, 2005 (continued).*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at | | | Average Across Locations | |
|---|---|---|---|---|---|---|---|
| | | | Lamberton | Plainview | Waseca | Bu/Acre | % Moisture |
| ***98 to 101 RM Hybrids***, continued | | | | | | | |
| Epley | E14H07HX | 100 | 229 | 226 | 229 | 228 | 18.7 |
| NuTech | NT-4202 YGCB | 101 | 190 | 193 | 227 | 203 | 18.9 |
| NuTech | NT-5101 RR/YGCB | 100 | 199 | 242 | 236 | 226 | 19.0 |
| Wensman | W5314Bt | 101 | 176 | 229 | 213 | 206 | 19.2 |
| Farm Advantage | 5501 | 101 | 177 | 229 | 232 | 213 | 19.2 |
| Wensman | W6315BtRR | 101 | 199 | 235 | 236 | 223 | 19.5 |
| Legacy | L4237 | 100 | 172 | 218 | 265 | 218 | 19.5 |
| NuTech | NT-2302 HX | 101 | 208 | 234 | 196 | 213 | 19.6 |
| NuTech | NT-4200 YGCB | 99 | 186 | 233 | 222 | 214 | 19.6 |
| High Cycle by Trelay | 5B353 | 100 | 191 | 231 | 237 | 219 | 19.7 |
| Garst | 8745YG1/RR | 101 | 162 | 235 | 223 | 207 | 19.9 |
| Trisler | T-2475CB | 100 | 211 | 212 | 248 | 224 | 20.1 |
| NuTech | NT-2000 HX | 99 | 192 | 209 | 257 | 220 | 20.1 |
| NuTech | 3505RR | 100 | 215 | 239 | 249 | 234 | 20.6 |
| ***98 to 101 RM Averages:*** | | | ***186*** | ***232*** | ***230*** | ***216*** | ***18.7*** |
| ***102 to 103 RM Hybrids*** | | | | | | | |
| Dekalb | DKC52-47 | 102 | 209 | 243 | 237 | 230 | 17.4 |
| Kruger | 5602YGCB | 102 | 208 | 215 | 248 | 224 | 18.1 |
| Dahlman | R51-20YGP | 102 | 174 | 255 | 236 | 222 | 18.1 |
| Wensman | W5349Bt | 102 | 192 | 243 | 250 | 229 | 18.2 |
| Kruger | 3503TS | 103 | 211 | 248 | 224 | 227 | 18.2 |
| Renk | RK632YGCB | 102 | 162 | 234 | 226 | 207 | 18.3 |
| Kruger | 0603B | 103 | 186 | 229 | 254 | 223 | 18.3 |
| Dekalb | DKC53-11 | 103 | 212 | 246 | 231 | 229 | 18.6 |
| Dekalb | DKC52-23 | 102 | 169 | 239 | 222 | 210 | 18.6 |
| Renk | RK652LLYGCB | 103 | 165 | 214 | 193 | 190 | 18.6 |
| Dahlman | R51-20CB | 102 | 194 | 230 | 255 | 226 | 18.9 |
| Crows | 2780B | 102 | 207 | 224 | 222 | 218 | 19.2 |
| Viking | HL6592 | 103 | 162 | 229 | 217 | 203 | 19.3 |
| Kruger | 0603A | 103 | 189 | 250 | 260 | 233 | 19.4 |
| Trisler | T-2390HX | 102 | 190 | 223 | 203 | 205 | 19.4 |
| Kruger | 8602HX | 102 | 145 | 233 | 180 | 186 | 19.4 |
| Epley | E1442 | 102 | 173 | 222 | 207 | 201 | 19.5 |
| Kruger | 9203RR/YGCB | 103 | 169 | 232 | 253 | 218 | 19.6 |
| Trisler | T-2744CB | 102 | 199 | 222 | 236 | 219 | 19.8 |
| Renk | RK636RRYGCB | 103 | 158 | 231 | 214 | 201 | 19.8 |
| Kaltenberg | K5215Bt | 102 | 213 | 253 | 251 | 239 | 19.9 |
| High Cycle by Trelay | 5H336 | 102 | 194 | 238 | 219 | 217 | 20.0 |
| Kruger | 5504YGCB | 103 | 204 | 227 | 212 | 214 | 20.2 |
| Epley | E1430YGCB | 103 | 209 | 241 | 220 | 223 | 20.4 |
| ***102 to 103 RM averages:*** | | | ***187*** | ***234*** | ***228*** | ***216*** | ***19.0*** |
| ***Southern locations, early maturity averages:*** | | | ***185*** | ***228*** | ***226*** | ***213*** | ***18.4*** |
| ***LSD (0.20)*** | | | ***23*** | ***13*** | ***25*** | ***12*** | ***0.5*** |

*Late-maturity hybrids, southern locations, 2005.*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at | | | Average Across Locations | |
|---|---|---|---|---|---|---|---|
| | | | Lamberton | Plainview | Waseca | Bu/Acre | % Moisture |
| ***104 RM and later hybrids*** | | | | | | | |
| Renk | RK684YGCB | 106 | 205 | 241 | 228 | 224 | 18.5 |
| Jung | 6580YGCB | 104 | 191 | 212 | 207 | 203 | 19.7 |
| LG Seeds | LG2533 | 105 | 222 | 222 | 202 | 215 | 19.9 |
| Viking | 6693 | 104 | 210 | 225 | 211 | 215 | 20.1 |
| Dairyland Stealth | 5204 | 104 | 213 | 232 | 214 | 220 | 20.2 |
| Dekalb | DKC54-51 | 104 | 203 | 233 | 234 | 223 | 20.3 |
| Viking | B5583 | 106 | 209 | 248 | 237 | 232 | 20.4 |
| Jung | 6545YGCB | 105 | 197 | 230 | 234 | 221 | 20.4 |
| NuTech | 0005 | 105 | 214 | 246 | 206 | 222 | 20.5 |
| NuTech | NT-4008 YGCB | 108 | 192 | 253 | 239 | 228 | 20.5 |
| Anderson Seeds | 4033 | 106 | 197 | 219 | 210 | 209 | 20.5 |
| Pioneer | 35A30 | 104 | 213 | 265 | 244 | 241 | 20.5 |
| Dairyland Stealth | 1705 | 105 | 194 | 235 | 243 | 224 | 20.6 |
| High Cycle by Trelay | 5P825 | 104 | 215 | 210 | 180 | 202 | 20.6 |
| Anderson Seeds | 105Y | 105 | 194 | 230 | 231 | 218 | 20.7 |
| Epley | E25R90YGCB | 108 | 193 | 213 | 209 | 205 | 20.7 |
| Kruger | 0605B | 105 | 225 | 237 | 230 | 231 | 20.8 |
| Dairyland Stealth | 5503 | 106 | 216 | 234 | 182 | 211 | 20.8 |
| Pioneer | 35Y67 | 106 | 215 | 243 | 221 | 227 | 20.8 |
| Kruger | 0605A | 105 | 199 | 269 | 238 | 235 | 20.9 |
| Anderson Seeds | 106YR | 106 | 207 | 200 | 192 | 200 | 20.9 |
| Kruger | 9407YGCB | 107 | 187 | 248 | 208 | 214 | 21.0 |
| Farm Advantage | 1065 | 105 | 217 | 259 | 222 | 233 | 21.0 |
| Kruger | 2506RR/YGCB | 106 | 232 | 239 | 236 | 236 | 21.0 |
| Kruger | 5405YGCB | 105 | 197 | 237 | 224 | 219 | 21.0 |
| Farm Advantage | 6504 | 104 | 208 | 233 | 234 | 225 | 21.1 |
| Dairyland Stealth | 5104 | 104 | 197 | 240 | 207 | 215 | 21.1 |
| Kruger | 2605RR/YGCB | 105 | 193 | 249 | 212 | 218 | 21.2 |
| Garst | 8689IT | 104 | 222 | 238 | 231 | 230 | 21.2 |
| Wensman | W6318BtRR | 104 | 180 | 256 | 247 | 228 | 21.4 |
| Dekalb | DKC55-82 | 105 | 197 | 249 | 228 | 225 | 21.5 |
| Kruger | 8605HX | 105 | 185 | 213 | 214 | 204 | 21.5 |
| Kruger | 5505YGCB | 105 | 205 | 238 | 214 | 219 | 21.6 |
| Kruger | 0508 | 108 | 185 | 207 | 234 | 209 | 21.7 |
| Kruger | 5606YGCB | 106 | 212 | 217 | 229 | 219 | 21.7 |
| Pioneer | 34A15 | 108 | 203 | 259 | 226 | 229 | 21.8 |
| Viking | BW5314 | 106 | 184 | 251 | 214 | 216 | 21.8 |
| Pioneer | 34N42 | 111 | 210 | 253 | 238 | 234 | 22.1 |
| Anderson Seeds | 4332 | 107 | 165 | 222 | 219 | 202 | 22.2 |
| AgriGold | A6333BtRR | 104 | 209 | 240 | 170 | 206 | 22.3 |
| NuTech | NT-3505 | 105 | 170 | 236 | 220 | 209 | 22.3 |
| Wensman | W5417Bt | 107 | 232 | 234 | 217 | 228 | 22.3 |
| Wensman | W5437Bt | 110 | 206 | 227 | 210 | 214 | 22.4 |
| NuTech | NT-0708 | 108 | 206 | 243 | 267 | 239 | 22.8 |

*Late-maturity hybrids, southern locations, 2005 (continued).*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at Lamberton | Plainview | Waseca | Average Across Locations Bu/Acre | % Moisture |
|---|---|---|---|---|---|---|---|
| ***104 RM and later hybrids***, continued | | | | | | | |
| Wensman | W6422BtRR | 107 | 217 | 228 | 190 | 212 | 23.0 |
| Garst | 8534YG1/RR | 108 | 217 | 216 | 212 | 215 | 23.1 |
| High Cycle by Trelay | 6H295 | 105 | 198 | 192 | 180 | 190 | 23.2 |
| Pioneer | 34P88 | 110 | 186 | 258 | 265 | 237 | 23.4 |
| Kruger | 8607HX | 107 | 195 | 195 | 220 | 203 | 23.4 |
| AgriGold | XA1509Bt | 106 | 204 | 241 | 240 | 229 | 24.0 |
| Jung | 6710RR/YGCB | 112 | 200 | 216 | 221 | 213 | 24.6 |
| ***Southern locations, late maturity averages:*** | | | ***203*** | ***234*** | ***220*** | ***219*** | ***21.4*** |
| ***LSD (0.20)*** | | | ***17*** | ***16*** | ***28*** | ***12*** | ***0.8*** |

*Early-maturity hybrids, central locations, 2005.*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at Morris | Rosemount | Average Across Locations Bu/Acre | % Moisture |
|---|---|---|---|---|---|---|
| ***92 and earlier RM hybrids*** | | | | | | |
| NuTech | NT-0991 | 90 | 232 | 177 | 204 | 18.2 |
| Hyland Seeds | Juxxin | 91 | 197 | 162 | 180 | 18.4 |
| NuTech | NT-1990 LL/BT | 90 | 178 | 165 | 171 | 18.5 |
| Garst | 8921YG1/RR | 92 | 220 | 191 | 205 | 18.6 |
| Hyland Seeds | HL B282 | 92 | 222 | 196 | 209 | 18.8 |
| Wensman | W5117Bt | 92 | 236 | 189 | 213 | 18.9 |
| Dairyland Stealth | 7191 | 91 | 216 | 191 | 204 | 19.1 |
| Wensman | W6117BtRR | 92 | 225 | 190 | 208 | 19.1 |
| Seeds 2000 | 2922RR/Bt | 92 | 232 | 183 | 208 | 19.1 |
| Dairyland Stealth | 5692 | 92 | 225 | 185 | 205 | 19.2 |
| Kruger | 9392RR/YGCB | 92 | 215 | 195 | 205 | 19.5 |
| NuTech | NT-5191 + RR/YGCB | 90 | 218 | 191 | 204 | 19.5 |
| Hyland Seeds | HL R234 | 91 | 227 | 196 | 211 | 19.5 |
| Dahlman | R45-15YGP | 92 | 227 | 190 | 209 | 19.6 |
| Dyna-Gro | 53P30 | 92 | 224 | 184 | 204 | 19.6 |
| NuTech | NT-1992 LL/YGCB | 91 | 217 | 176 | 196 | 19.7 |
| Renk | RK438YGCB | 92 | 226 | 189 | 207 | 19.8 |
| Dekalb | DKC42-95 | 92 | 226 | 196 | 211 | 20.2 |
| Hyland Seeds | HL 2368 | 92 | 219 | 191 | 205 | 20.2 |
| High Cycle by Trelay | 7242YGCB | 90 | 215 | 185 | 200 | 20.7 |
| NuTech | NT-8494 YGPLUS | 92 | 231 | 182 | 207 | 20.9 |
| ***92 RM and earlier averages:*** | | | ***220*** | ***186*** | ***203*** | ***19.4*** |
| ***93 to 95 RM hybrids*** | | | | | | |
| Kruger | 0693 | 93 | 204 | 199 | 202 | 17.6 |
| Kruger | 9593RR/YGCB | 93 | 232 | 190 | 211 | 18.6 |
| Pioneer | 38T41 | 94 | 188 | 163 | 176 | 18.9 |
| Renk | RK452LLYGCB | 94 | 220 | 182 | 201 | 18.9 |
| Wensman | W6212RR | 95 | 239 | 186 | 213 | 18.9 |
| Jung | 6432YGCB | 95 | 252 | 190 | 221 | 19.1 |
| NuTech | NT-3696 RR | 95 | 219 | 180 | 200 | 19.1 |
| NuTech | NT-0094 | 94 | 202 | 185 | 193 | 19.2 |

*Early-maturity hybrids, central locations, 2005 (continued).*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at | | Average Across Locations | |
|---|---|---|---|---|---|---|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| ***93 to 95 RM hybrids, continued*** | | | | | | |
| Legacy | L3077Bt | 95 | 238 | 200 | 219 | 19.4 |
| Dahlman | R48-15 | 95 | 221 | 193 | 207 | 19.5 |
| Gold Country | 94-01 CB | 94 | 250 | 195 | 222 | 19.6 |
| Kruger | 9496YGCB | 94 | 226 | 197 | 211 | 19.6 |
| Dairyland Stealth | 5194 | 94 | 221 | 187 | 204 | 19.7 |
| Hyland Seeds | Laxxot Bt | 93 | 207 | 174 | 190 | 20.0 |
| NuTech | NT-8494 + YGPLUS | 93 | 254 | 175 | 215 | 20.0 |
| Seeds 2000 | 2953RR | 95 | 231 | 186 | 209 | 20.1 |
| Wensman | W6194BtRR | 94 | 225 | 189 | 207 | 20.2 |
| Dahlman | D48-15 | 95 | 245 | 200 | 223 | 20.2 |
| Legacy | L3877Bt/LL | 95 | 211 | 195 | 203 | 20.2 |
| NuTech | NT-3595 RR | 94 | 207 | 190 | 199 | 20.4 |
| Kruger | 0695 | 95 | 227 | 188 | 208 | 20.6 |
| NuTech | NT-7595 RR | 94 | 225 | 190 | 207 | 20.6 |
| NuTech | NT-4595 YGCB | 94 | 246 | 196 | 221 | 20.7 |
| NuTech | NT-0095 | 94 | 215 | 195 | 205 | 21.5 |
| ***93 to 95 RM averages:*** | | | ***225*** | ***189*** | ***207*** | ***19.7*** |
| ***Central locations, early maturity averages:*** | | | ***223*** | ***187*** | ***205*** | ***19.5*** |
| ***LSD (0.20)*** | | | ***20*** | ***9*** | ***11*** | ***1.1*** |

*Late-maturity hybrids, central locations, 2005.*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at | | Average Across Locations | |
|---|---|---|---|---|---|---|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| ***99 and earlier RM hybrids*** | | | | | | |
| High Cycle by Trelay | 4G721 | 96 | 198 | 175 | 186 | 19.2 |
| Anderson Seeds | 7902 | 96 | 232 | 193 | 213 | 19.3 |
| Kruger | 1697RR | 96 | 229 | 193 | 211 | 19.5 |
| Anderson Seeds | 796R | 96 | 215 | 207 | 211 | 19.5 |
| Dairyland Stealth | 6497 | 97 | 237 | 190 | 213 | 19.7 |
| Dekalb | DKC47-10 | 97 | 240 | 199 | 220 | 19.7 |
| AgSource | 3931RR | 96 | 232 | 189 | 210 | 19.7 |
| Dairyland Stealth | 5497 | 97 | 235 | 205 | 220 | 20.1 |
| AgSource | 4021RR | 96 | 213 | 206 | 210 | 20.1 |
| Pioneer | 37A92 | 97 | 215 | 192 | 203 | 20.3 |
| Garst | 8880YG1 | 96 | 253 | 210 | 232 | 20.4 |
| Dekalb | DKC48-52 | 98 | 242 | 208 | 225 | 20.4 |
| Kruger | 5697YGCB | 97 | 225 | 206 | 215 | 20.4 |
| Kruger | 2697RR/YGCB | 97 | 239 | 201 | 220 | 20.7 |
| Renk | RK488YGCB | 96 | 243 | 204 | 223 | 20.7 |
| Pioneer | 37F73 | 99 | 212 | 197 | 205 | 20.9 |
| Wensman | W5212Bt | 96 | 240 | 201 | 221 | 21.2 |
| LG Seeds | LG2463Bt | 96 | 248 | 207 | 227 | 21.2 |
| Kaltenberg | K4688Bt | 96 | 225 | 212 | 218 | 21.3 |
| Kruger | 1597RR | 97 | 221 | 203 | 212 | 21.3 |

*Late-maturity hybrids, central locations, 2005 (continued).*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at | | Average Across Locations | |
|---|---|---|---|---|---|---|
| | | | Morris | Rosemount | Bu/Acre | % Moisture |
| ***99 and earlier RM hybrids***, continued | | | | | | |
| Anderson Seeds | 797Y | 96 | 233 | 203 | 218 | 21.3 |
| Seeds 2000 | 2953Bt | 96 | 232 | 203 | 218 | 21.4 |
| Pioneer | 38H66 | 98 | 223 | 202 | 213 | 21.6 |
| LG Seeds | LG2475BtRR | 97 | 218 | 204 | 211 | 21.9 |
| Dyna-Gro | EX 05497 | 97 | 211 | 194 | 203 | 22.2 |
| NuTech | NT-4000 YGCB | 99 | 198 | 181 | 189 | 22.3 |
| NuTech | NT-3999 RR | 99 | 237 | 202 | 219 | 22.4 |
| Wensman | W6266BtRR | 97 | 224 | 219 | 222 | 22.5 |
| Jung | 6422RR/YGCB | 99 | 229 | 203 | 216 | 22.6 |
| Garst | 8770YG1 | 99 | 233 | 186 | 209 | 22.7 |
| Anderson Seeds | 6061 | 99 | 204 | 186 | 195 | 22.9 |
| Kruger | 1698RR | 98 | 223 | 191 | 207 | 23.6 |
| NuTech | NT-4200 YGCB | 99 | 230 | 207 | 219 | 24.4 |
| NuTech | NT-2000 HX | 99 | 221 | 183 | 202 | 24.8 |
| ***99 RM and earlier averages:*** | | | ***227*** | ***199*** | ***213*** | ***21.2*** |
| ***Later than 99 RM hybrids*** | | | | | | |
| Kruger | K-1500RR | 100 | 245 | 219 | 232 | 20.2 |
| Kruger | 0600 | 100 | 212 | 183 | 197 | 20.6 |
| Dekalb | DKC50-20 | 100 | 238 | 188 | 213 | 21.6 |
| High Cycle by Trelay | 5B578 | 100 | 230 | 199 | 214 | 22.0 |
| Legacy | L4199 Bt | 101 | 237 | 201 | 219 | 22.1 |
| Wensman | W5349Bt | 102 | 222 | 193 | 207 | 22.2 |
| Garst | 8748YG1 | 101 | 237 | 208 | 223 | 22.4 |
| Dairyland Stealth | 5201 | 101 | 246 | 209 | 227 | 22.6 |
| Pioneer | 36W66 | 102 | 239 | 202 | 221 | 22.7 |
| Renk | RK652LLYGCB | 103 | 217 | 206 | 211 | 22.8 |
| LG Seeds | LG2491BtRW | 100 | 211 | 208 | 209 | 23.0 |
| Kruger | 2600RR/YGCB | 100 | 205 | 198 | 201 | 23.1 |
| High Cycle by Trelay | 7560YGCB | 100 | 196 | 215 | 206 | 23.1 |
| Kruger | 5504YGCB | 103 | 251 | 207 | 229 | 23.1 |
| Renk | RK632YGCB | 102 | 228 | 190 | 209 | 23.1 |
| Kruger | 3503TS | 103 | 223 | 186 | 204 | 23.2 |
| Kruger | 4501RR/YGRW | 101 | 223 | 195 | 209 | 23.4 |
| Dahlman | R51-20YGP | 102 | 221 | 197 | 209 | 23.5 |
| Kruger | 9203RR/YGCB | 103 | 226 | 196 | 211 | 23.7 |
| NuTech | NT-4202 YGCB | 101 | 246 | 191 | 218 | 23.8 |
| Garst | 8745YG1/RR | 101 | 218 | 199 | 208 | 23.9 |
| High Cycle by Trelay | 5B353 | 100 | 220 | 212 | 216 | 24.0 |
| NuTech | NT-2302 HX | 101 | 223 | 196 | 209 | 24.1 |
| Jung | 6580YGCB | 104 | 187 | 171 | 179 | 24.1 |
| Gold Country | 100-05CB | 100 | 225 | 199 | 212 | 24.2 |
| Wensman | W5314Bt | 101 | 207 | 187 | 197 | 24.2 |
| High Cycle by Trelay | 5P947 | 100 | 219 | 207 | 213 | 24.2 |
| Kruger | 8602HX | 102 | 200 | 177 | 189 | 24.4 |
| Garst | 8689IT | 104 | 235 | 206 | 221 | 24.5 |
| NuTech | NT-5101 RR/YGCB | 100 | 212 | 202 | 207 | 24.5 |
| Wensman | W6318BtRR | 104 | 257 | 197 | 227 | 24.6 |
| Kaltenberg | K5244RR-Bt | 102 | 195 | 205 | 200 | 24.6 |

*Late-maturity hybrids, central locations, 2005 (continued).*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at Morris | Yield, Bushels/Acre at Rosemount | Average Across Locations Bu/Acre | Average Across Locations % Moisture |
|---|---|---|---|---|---|---|
| ***Later than 99 RM hybrids***, continued | | | | | | |
| Jung | 6545YGCB | 105 | 245 | 214 | 230 | 24.7 |
| Renk | RK636RRYGCB | 103 | 211 | 199 | 205 | 25.0 |
| High Cycle by Trelay | 5H336 | 102 | 215 | 170 | 192 | 25.5 |
| Kruger | 5505YGCB | 105 | 246 | 192 | 219 | 25.5 |
| Wensman | W6315BtRR | 101 | 196 | 187 | 192 | 25.8 |
| Dairyland Stealth | 5104 | 104 | 210 | 196 | 203 | 26.4 |
| NuTech | 3505RR | 100 | 220 | 193 | 206 | 26.5 |
| High Cycle by Trelay | 6N813 | 100 | 191 | 179 | 185 | 27.8 |
| Hyland Seeds | HL 2676 | 103 | 213 | 199 | 206 | 28.7 |
| ***Later than 99 RM averages:*** | | | ***222*** | ***197*** | ***209*** | ***23.9*** |
| ***Central locations, late maturity averages:*** | | | ***224*** | ***198*** | ***211*** | ***22.7*** |
| ***LSD (0.20)*** | | | ***19*** | ***11*** | ***11*** | ***1.3*** |

*Hybrids, northern locations, 2005.*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at Rothsay | Yield, Bushels/Acre at Staples | Average Across Locations Bu/Acre | Average Across Locations % Moisture |
|---|---|---|---|---|---|---|
| ***82 and earlier RM hybrids*** | | | | | | |
| NuTech | NT-3383 RR | 82 | 153 | 199 | 176 | 16.6 |
| Wensman | W6082BtRR | 82 | 152 | 194 | 173 | 16.8 |
| NuTech | NT-3883 RR | 82 | 147 | 205 | 176 | 16.8 |
| Proseed | RR581Bt | 81 | 173 | 207 | 190 | 16.9 |
| AgSource | 2661RR | 82 | 161 | 192 | 177 | 17.2 |
| Wensman | W5081Bt | 82 | 165 | 186 | 175 | 17.3 |
| Seeds 2000 | 2821RR/Bt | 82 | 166 | 215 | 191 | 17.6 |
| NuTech | NT-5883 RR/YGCB | 82 | 146 | 177 | 162 | 17.7 |
| NuTech | NT-1882 LL/BT | 82 | 164 | 185 | 175 | 17.9 |
| NuTech | NT-5383-RR/YGCB | 82 | 169 | 191 | 180 | 17.9 |
| ***82 and earlier RM averages:*** | | | ***160*** | ***195*** | ***177*** | ***17.3*** |
| ***83 to 87 RM hybrids*** | | | | | | |
| Dekalb | DKC35-02 | 85 | 148 | 171 | 159 | 16.6 |
| Dekalb | DKC33-11 | 83 | 152 | 180 | 166 | 16.7 |
| Dahlman | R42-15 | 85 | 152 | 192 | 172 | 16.8 |
| Mycogen | 2R194 | 85 | 169 | 214 | 191 | 16.8 |
| Kruger | 1584RR | 84 | 151 | 207 | 179 | 16.9 |
| Dairyland Stealth | 6685 | 85 | 152 | 204 | 178 | 16.9 |
| Brownseed | Ex 804LL | 83 | 144 | 173 | 158 | 17.1 |
| NuTech | NT-3885 + RR | 85 | 163 | 207 | 185 | 17.1 |
| Dekalb | DKC35-51 | 85 | 161 | 197 | 179 | 17.2 |
| Proseed | RR585 | 85 | 150 | 202 | 176 | 17.2 |
| NuTech | NT-3185 RR | 85 | 159 | 198 | 179 | 17.3 |
| Wensman | W6085RR | 85 | 155 | 210 | 182 | 17.4 |
| Wensman | W6083RR | 84 | 157 | 222 | 189 | 17.4 |
| Dairyland Stealth | 1785 | 85 | 141 | 195 | 168 | 17.5 |
| NuTech | NT-3885 RR | 85 | 163 | 199 | 181 | 17.5 |
| Dekalb | DKC37-14 | 87 | 120 | 205 | 163 | 17.5 |

*Hybrids, northern locations, 2005 (continued).*

| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at Rothsay | Yield, Bushels/Acre at Staples | Average Across Locations Bu/Acre | Average Across Locations % Moisture |
|---|---|---|---|---|---|---|
| ***83 to 87 RM hybrids***, continued | | | | | | |
| Mycogen | 2P172 | 84 | 157 | 213 | 185 | 17.5 |
| Kruger | 2585RR/YGCB | 85 | 169 | 196 | 183 | 17.5 |
| Dyna-Gro | 51P33 | 85 | 177 | 208 | 193 | 17.5 |
| Renk | RK288YGCB | 85 | 163 | 207 | 185 | 17.6 |
| Dahlman | D42-15CB | 85 | 175 | 222 | 199 | 17.6 |
| Jung | 6202RR/YGCB | 83 | 169 | 198 | 184 | 17.7 |
| Dyna-Gro | 51P15 | 85 | 154 | 208 | 181 | 17.7 |
| Pioneer | 39D82 | 87 | 173 | 207 | 190 | 17.7 |
| Kruger | 1684RR | 84 | 166 | 192 | 179 | 17.9 |
| Peterson Farms Seed | 76E85 YGCB | 85 | 169 | 205 | 187 | 18.0 |
| NuTech | NT-5383 + RR/YGCB | 83 | 174 | 213 | 193 | 18.0 |
| Kruger | 5687BT/LL | 87 | 151 | 184 | 167 | 18.0 |
| Wensman | W5085Bt | 85 | 182 | 201 | 192 | 18.1 |
| Renk | RK244LLYGCB | 85 | 155 | 197 | 176 | 18.2 |
| Wensman | W6086BtRR | 85 | 179 | 219 | 199 | 18.3 |
| Proseed | 587B11 | 87 | 138 | 195 | 167 | 18.8 |
| Proseed | RR584 | 84 | 152 | 188 | 170 | 19.0 |
| ***83 to 87 RM averages*** | | | ***159*** | ***201*** | ***180*** | ***17.5*** |
| ***88 to 92 RM hybrids*** | | | | | | |
| NuTech | NT-3088 RR | 88 | 155 | 212 | 184 | 17.0 |
| Dekalb | DKC 40-05 | 90 | 170 | 237 | 203 | 17.2 |
| Seeds 2000 | 2882RR | 88 | 154 | 202 | 178 | 17.2 |
| Wensman | W6095BtRR | 88 | 153 | 200 | 177 | 17.4 |
| NuTech | NT-3090RR | 90 | 156 | 204 | 180 | 17.7 |
| Dahlman | R45-15 | 90 | 171 | 246 | 208 | 17.8 |
| Kruger | 2690RR/YGCB | 90 | 169 | 227 | 198 | 17.9 |
| Kruger | 2688YGCB | 88 | 162 | 194 | 178 | 18.2 |
| NuTech | NT-0991 | 90 | 186 | 234 | 210 | 18.4 |
| Kruger | 9392RR/YGCB | 92 | 184 | 228 | 206 | 18.4 |
| Proseed | RRP92Bt | 92 | 165 | 213 | 189 | 18.7 |
| Hyland Seeds | Juxxin | 91 | 173 | 228 | 200 | 18.7 |
| NuTech | NT-1990 LL/BT | 90 | 146 | 195 | 171 | 18.8 |
| Dairyland Stealth | 7191 | 91 | 169 | 214 | 191 | 18.8 |
| NuTech | NT-1888 LL/BT | 88 | 176 | 211 | 193 | 18.9 |
| Proseed | 588Bt | 88 | 169 | 202 | 186 | 18.9 |
| Kruger | 5692BT/LL | 92 | 196 | 227 | 211 | 19.0 |
| Jung | 6418ARRYGCB | 92 | 199 | 215 | 207 | 19.2 |
| Peterson Farms Seed | 76I92 YGCB | 92 | 166 | 219 | 192 | 19.2 |
| Proseed | RRPS92Bt | 92 | 176 | 196 | 186 | 19.3 |
| Dairyland Stealth | 1488 | 88 | 152 | 185 | 168 | 19.3 |
| Kruger | 0692 | 92 | 148 | 202 | 175 | 19.3 |
| Seeds 2000 | 2922RR/Bt | 92 | 177 | 235 | 206 | 19.4 |
| Dahlman | R45S15 | 92 | 181 | 221 | 201 | 19.4 |
| Dahlman | D45-15 | 92 | 206 | 245 | 226 | 19.4 |
| Brownseed | 3000 YGCB | 90 | 181 | 232 | 207 | 19.5 |
| Wensman | W6117BtRR | 92 | 208 | 241 | 225 | 19.5 |
| Pioneer | 39F28 | 89 | 164 | 214 | 189 | 19.6 |

***Hybrids, northern locations, 2005 (continued).***

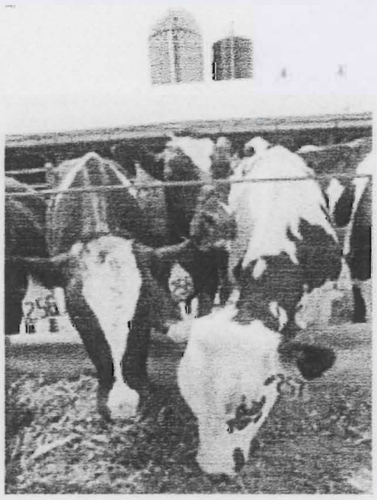
| Source/Brand | Hybrid | Relative Maturity | Yield, Bushels/Acre at Rothsay | Yield, Bushels/Acre at Staples | Average Across Locations Bu/Acre | Average Across Locations % Moisture |
|---|---|---|---|---|---|---|
| ***88 to 92 RM hybrids***, continued | | | | | | |
| Hyland Seeds | HL 2368 | 92 | 183 | 232 | 207 | 19.6 |
| AgSource | 3566RRBt | 92 | 186 | 217 | 202 | 19.7 |
| NuTech | NT-5191+ RR/YGCB | 90 | 162 | 221 | 192 | 19.8 |
| Kaltenberg | K3914Bt | 92 | 163 | 231 | 197 | 19.9 |
| Hyland Seeds | HL B282 | 92 | 184 | 238 | 211 | 20.1 |
| Hyland Seeds | HL R234 | 91 | 171 | 223 | 197 | 20.1 |
| Dahlman | R45-15YGP | 92 | 176 | 251 | 214 | 20.1 |
| Wensman | W5117Bt | 92 | 191 | 221 | 206 | 20.1 |
| Kruger | 1691RR | 91 | 164 | 192 | 178 | 20.2 |
| Renk | RK438YGCB | 92 | 176 | 229 | 202 | 20.2 |
| LG Seeds | LG2407 Bt | 92 | 191 | 219 | 205 | 20.3 |
| NuTech | NT-8494 YGPLUS | 92 | 178 | 220 | 199 | 20.3 |
| ***88 to 92 RM averages:*** | | | ***173*** | ***219*** | ***196*** | ***19.1*** |
| ***93 and later RM hybrids*** | | | | | | |
| Kruger | 9593RR/YGCB | 93 | 161 | 216 | 189 | 18.2 |
| Mycogen | 2T336 | 93 | 176 | 230 | 203 | 18.8 |
| Pioneer | 38W22 | 93 | 178 | 213 | 195 | 18.8 |
| Hyland Seeds | Laxxot Bt | 93 | 179 | 220 | 199 | 19.2 |
| Pioneer | 38T41 | 94 | 151 | 214 | 183 | 19.5 |
| Mycogen | 2R426 | 95 | 201 | 251 | 226 | 19.6 |
| Dairyland Stealth | 5194 | 94 | 199 | 236 | 217 | 19.6 |
| Proseed | 95S04Bt | 95 | 201 | 237 | 219 | 19.6 |
| Kaltenberg | K4688Bt | 96 | 205 | 260 | 232 | 19.9 |
| NuTech | NT-3696 RR | 95 | 176 | 258 | 217 | 19.9 |
| Wensman | W6212RR | 95 | 172 | 241 | 206 | 20.0 |
| Renk | RK488YGCB | 96 | 178 | 242 | 210 | 20.1 |
| NuTech | NT-4595 YGCB | 94 | 198 | 245 | 222 | 20.2 |
| NuTech | NT-0095 | 94 | 160 | 242 | 201 | 20.5 |
| Wensman | W5212Bt | 96 | 192 | 250 | 221 | 20.5 |
| Jung | 6432YGCB | 95 | 195 | 243 | 219 | 20.6 |
| Wensman | W6194BtRR | 94 | 185 | 214 | 199 | 20.8 |
| Kruger | 9496YGCB | 94 | 193 | 208 | 201 | 21.0 |
| Proseed | 599Bt | 99 | 190 | 247 | 219 | 21.6 |
| Wensman | W6266BtRR | 97 | 190 | 232 | 211 | 22.8 |
| ***93 and later RM averages:*** | | | ***184*** | ***235*** | ***209*** | ***20.1*** |
| ***Northern locations, averages*** | | | ***169*** | ***214*** | ***192*** | ***18.6*** |
| ***LSD (0.20)*** | | | ***13*** | ***16*** | ***10*** | ***0.9*** |

Minnesota Agricultural Experiment Station
University of Minnesota

# Corn Silage

C.C. Sheaffer, P.R. Peterson and D.R. Swanson

## Varietal Trials Results, January 2006



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

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

### Test Sites

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

**Southeast Dairy Region:**
Harmony (Fillmore County)
Potsdam (Olmsted County)

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

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

### Test Procedure

**Southeast and Central**

**Design:** Small plots were established at Harmony, Potsdam, Paynesville and Melrose in randomized complete block designs with four replications. Hybrids were planted at 33,000 seeds per acre with 30-inch row spacing on May 4 at the SE sites and May 10 at the Central sites. Plant nutrients as manure or inorganic fertilizer were applied to maximize plant yield. Cultivation and herbicides applied by University of Minnesota recommendation were used to control weeds.

**Harvesting:** Plots were harvested and whole-plant herbage sampled for yields and forage quality at each site. The harvest date was targeted at test sites when average whole-plant moisture across entries averaged 65%. Harvest dates at Harmony, Potsdam, Paynesville and Melrose were September 12, September 14, September 16 and September 20, respectively.

**West-Central**

**Design:** Large plots were established May 2 near Ottertail under center-pivot irrigation in a randomized complete block design with three replications. Hybrids were planted at 34,000 seeds per acre with 30-inch row spacing. Fertilizer was applied at a pre-plant rate of 8,000 gallons dairy manure per acre. Pre-emergent herbicide was applied to control weeds.

**Harvesting:** Plots were harvested and whole-plant herbage sampled for yield and forage quality on September 17.

### Results Provided

Tables summarize hybrid yield and forage quality results from Harmony, Potsdam, Paynesville, Melrose and Ottertail, respectively. Relative maturity (RM), moisture content, whole-plant dry matter (DM) yield and silage yield are listed, and hybrids are ranked in descending order of milk yield per acre (Milk Yield, lb./acre).

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

Milk production potentials per ton (lb. milk/ton forage) and per acre (lb. milk/acre forage) of forage were calculated using the MILK2000 spreadsheet developed by the University of Wisconsin. MILK2000 approximates animal performance based on a standard cow weight and milk production level (1,350 lb. body weight and 90 lb. milk/day at 3.8% fat). Values based on field calculations for hybrid moisture and DM yield; laboratory values for CP, NDF, NDFD, starch and ash concentration; and book values for NDFCP (1.3%) and ether extract (3.2%) concentration were used for spreadsheet calculations. For MILK2000 predictions, we assumed that kernel processing occurred.

## How To Use Results

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

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

***Companies participating in 2005 hybrid corn silage trials.***

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

**Dyna Gro Seed Company,** 221 W Lake Lansing Rd., Suite 102, East Lansing, MI 48823

**Epley Bros. Hybrids, Inc.,** P.O. Box 310, Shell Rock, IA 50670

**Garst Seed Company,** 2369 330th St., Slater, IA 50244

**Hyland Seeds,** 2 Hyland Drive, Blenheim, Ontario, Canada N0P 1A0

**Legacy Seeds, Inc.,** 210 Pine Street, Waupaca, WI 54981

**Monsanto Seed Group, Dekalb Genetics**, 3100 Sycamore Road, De Kalb, IL 60115

**Nu Tech Seed Co.,** 307 3rd Street, Alice, ND 58031

**Pioneer Hi-Bred, International,** 7000 NW 62nd Ave., Johnston, IA 50131

**Producers Hybrids,** P.O. Box C, Battle Creek, NE 68715

**Renk Seed Company,** 6800 Wilburn Rd., Sun Prairie, WI 53590

**Syngenta Seeds, Inc. (NK),** 7500 Olson Memorial Hwy., Golden Valley, MN 55427

**Trelay Seeds,** 11623 State Road 80N, Livingston, WI 53554

***Relative maturity (RM), whole-plant moisture, silage yield and quality traits for corn hybrids planted at Harmony (Fillmore County) in 2005.***

| Brand/Hybrid | RM, Rating | Moisture, % | Yield, Ton/Acre[1] | | Quality (Concentration)[2] % | | | | | Milk Yield[3] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DM | Silage | CP | NDF | IVD | NDFD | Starch | Lb/Ton | Lb/Acre |
| Pioneer 35Y67 | 106 | 65.3 | 11.9 | 34.3 | 7.2 | 34 | 82 | 47 | 41 | 3,700 | 44,100 |
| Pioneer 33N29 | 113 | 68.4 | 11.9 | 37.7 | 7.2 | 36 | 81 | 49 | 39 | 3,640 | 43,400 |
| NK N33-H6 | 101 | 66.0 | 11.6 | 34.0 | 7.8 | 36 | 81 | 47 | 38 | 3,610 | 41,700 |
| Dyna-Gro DG55P57 | 102 | 65.1 | 11.6 | 33.2 | 7.4 | 38 | 79 | 46 | 35 | 3,470 | 40,300 |
| Pioneer 34A86 | 106 | 67.8 | 11.4 | 35.5 | 7.9 | 38 | 80 | 48 | 38 | 3,510 | 40,200 |
| Garst 8689IT | 100 | 63.7 | 10.9 | 30.1 | 6.8 | 35 | 81 | 45 | 41 | 3,610 | 39,400 |
| High Cycle 7748 | 109 | 69.7 | 11.6 | 38.2 | 7.4 | 38 | 79 | 45 | 37 | 3,400 | 39,400 |
| High Cycle 6B413 | 107 | 64.8 | 11.1 | 31.4 | 7.2 | 35 | 81 | 44 | 41 | 3,510 | 38,800 |
| DeKalb DKC 53-11 | 103 | 65.9 | 11.1 | 32.6 | 7.6 | 36 | 80 | 45 | 41 | 3,480 | 38,600 |
| Epley E5112 | 112 | 69.8 | 11.0 | 36.5 | 7.8 | 36 | 81 | 47 | 40 | 3,480 | 38,400 |
| Dairyland Stealth HiDF-3007 | 106 | 70.2 | 11.0 | 36.9 | 8.0 | 39 | 80 | 49 | 35 | 3,480 | 38,300 |
| Garst 8579RR | 100 | 69.5 | 10.6 | 34.7 | 7.5 | 36 | 81 | 48 | 41 | 3,600 | 38,100 |
| Pioneer 35D28 | 108 | 68.7 | 10.7 | 34.2 | 6.8 | 37 | 80 | 46 | 40 | 3,510 | 37,600 |
| High Cycle 7560 | 100 | 62.7 | 10.4 | 27.8 | 7.1 | 34 | 81 | 45 | 44 | 3,620 | 37,500 |
| DeKalb DKC 52-23 | 102 | 63.7 | 10.0 | 27.6 | 7.3 | 34 | 82 | 47 | 42 | 3,740 | 37,500 |
| DeKalb DKC 55-82 | 105 | 69.5 | 10.9 | 35.6 | 7.6 | 38 | 80 | 46 | 37 | 3,450 | 37,500 |
| Pioneer 33D63 | 115 | 71.0 | 10.8 | 37.1 | 8.3 | 40 | 80 | 51 | 35 | 3,460 | 37,300 |
| DeKalb DKC 54-51 | 104 | 68.5 | 10.9 | 34.7 | 7.6 | 39 | 79 | 46 | 37 | 3,410 | 37,300 |
| Epley E1493 | 105 | 66.7 | 10.3 | 30.8 | 7.2 | 34 | 81 | 45 | 43 | 3,620 | 37,100 |
| DeKalb DKC 57-30 | 107 | 68.5 | 10.4 | 32.9 | 7.4 | 37 | 80 | 45 | 41 | 3,500 | 36,200 |
| Pioneer 34M93 | 108 | 67.7 | 10.7 | 33.1 | 7.1 | 41 | 78 | 46 | 34 | 3,310 | 35,400 |
| DeKalb DKC 57-84 | 107 | 69.9 | 10.2 | 33.7 | 7.4 | 37 | 80 | 45 | 38 | 3,480 | 35,300 |
| Renk RK684YGCB | 106 | 66.3 | 9.8 | 28.9 | 7.5 | 36 | 80 | 44 | 40 | 3,520 | 34,300 |
| Legacy Seeds L6160 Bt | 108 | 65.9 | 9.7 | 28.4 | 7.5 | 36 | 81 | 46 | 41 | 3,520 | 34,100 |
| Producers Hybrids SS110 | 110 | 69.4 | 10.3 | 33.6 | 8.2 | 43 | 78 | 49 | 30 | 3,270 | 33,600 |
| Garst 8590RR | 100 | 68.5 | 9.7 | 30.9 | 7.2 | 38 | 80 | 47 | 37 | 3,440 | 33,400 |
| NK N49-E3 | 106 | 69.0 | 9.8 | 31.7 | 7.8 | 39 | 79 | 47 | 36 | 3,400 | 33,400 |
| Renk RK854 | 111 | 69.6 | 9.5 | 31.2 | 7.6 | 39 | 78 | 45 | 34 | 3,290 | 31,300 |
| Dairyland Stealth 1611 | 108 | 72.2 | 9.3 | 33.2 | 7.4 | 40 | 78 | 45 | 37 | 3,270 | 30,200 |
| Dyna-Gro DG53P30 | 92 | 61.1 | 8.4 | 21.5 | 7.1 | 36 | 79 | 41 | 41 | 3,400 | 28,500 |
| Producers Hybrids SS104RR | 104 | 72.9 | 8.0 | 29.5 | 7.2 | 43 | 78 | 48 | 30 | 3,180 | 25,500 |
| Mean | | 67.7 | 10.5 | 32.6 | 7.4 | 37 | 80 | 46 | 38 | 3,480 | 36,600 |
| LSD (0.10) | | 2.7 | 1.6 | 4.2 | 0.4 | 2 | 2 | 2 | 3 | 200 | 6,800 |

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

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

[3] Milk production was estimated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

***Relative maturity (RM), whole-plant moisture, silage yield and quality traits for corn hybrids planted at Potsdam (Olmsted County) in 2005.***

| Brand/Hybrid | RM, Rating | Moisture, % | Yield, Ton/Acre[1] | | Quality (Concentration)[2] % | | | | | Milk Yield[3] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DM | Silage | CP | NDF | IVD | NDFD | Starch | Lb/Ton | Lb/Acre |
| Garst 8689IT | 100 | 63.9 | 12.2 | 33.7 | 7.3 | 34 | 82 | 47 | 42 | 3,710 | 45,200 |
| Pioneer 35Y67 | 106 | 62.5 | 12.4 | 33.0 | 7.6 | 37 | 80 | 47 | 38 | 3,530 | 43,600 |
| DeKalb DKC 55-82 | 105 | 65.2 | 12.3 | 35.3 | 8.0 | 36 | 81 | 47 | 40 | 3,530 | 43,300 |
| Pioneer 34A86 | 106 | 62.5 | 11.7 | 31.2 | 7.9 | 36 | 81 | 48 | 40 | 3,610 | 42,300 |
| High Cycle 7748 | 109 | 65.6 | 11.8 | 34.2 | 7.7 | 37 | 81 | 48 | 38 | 3,550 | 41,800 |
| Dairyland Stealth 1611 | 108 | 67.3 | 11.7 | 35.7 | 8.0 | 37 | 81 | 48 | 38 | 3,510 | 41,100 |
| High Cycle 6B413 | 107 | 63.2 | 11.0 | 29.8 | 7.8 | 33 | 83 | 48 | 41 | 3,730 | 41,000 |
| DeKalb DKC 57-84 | 107 | 64.8 | 11.4 | 32.5 | 7.5 | 37 | 80 | 46 | 38 | 3,540 | 40,500 |
| Pioneer 35D28 | 108 | 65.2 | 12.0 | 34.3 | 7.3 | 39 | 79 | 47 | 38 | 3,370 | 40,300 |
| Renk RK854 | 111 | 66.6 | 12.2 | 36.4 | 7.6 | 40 | 79 | 46 | 32 | 3,270 | 39,800 |
| DeKalb DKC 53-11 | 103 | 62.6 | 11.4 | 30.4 | 7.2 | 37 | 80 | 45 | 41 | 3,470 | 39,500 |
| Pioneer 34M93 | 108 | 64.7 | 11.7 | 33.0 | 7.9 | 41 | 79 | 48 | 35 | 3,390 | 39,500 |
| Dyna-Gro DG55P57 | 102 | 62.4 | 11.0 | 29.3 | 7.5 | 38 | 80 | 47 | 37 | 3,510 | 38,700 |
| Legacy Seeds L6160 Bt | 108 | 63.2 | 11.4 | 30.9 | 7.3 | 37 | 79 | 45 | 39 | 3,380 | 38,400 |
| DeKalb DKC 57-30 | 107 | 63.3 | 11.1 | 30.3 | 7.3 | 38 | 79 | 45 | 39 | 3,410 | 37,900 |
| Garst 8579RR | 100 | 64.5 | 10.9 | 30.7 | 7.1 | 38 | 80 | 47 | 38 | 3,450 | 37,600 |
| Producers Hybrids SS104RR | 104 | 66.9 | 11.9 | 35.8 | 8.1 | 42 | 79 | 49 | 29 | 3,150 | 37,400 |
| Dairyland Stealth HiDF-3007 | 106 | 67.2 | 11.0 | 33.4 | 8.0 | 39 | 80 | 49 | 33 | 3,400 | 37,300 |
| Producers Hybrids SS110 | 110 | 65.0 | 11.1 | 31.6 | 8.6 | 41 | 79 | 50 | 31 | 3,350 | 37,100 |
| NK N33-H6 | 101 | 64.1 | 11.1 | 30.9 | 8.6 | 39 | 80 | 50 | 31 | 3,340 | 37,000 |
| Renk RK684YGCB | 106 | 64.6 | 10.5 | 29.5 | 8.0 | 37 | 80 | 47 | 38 | 3,510 | 36,700 |
| Garst 8590RR | 100 | 65.9 | 10.7 | 31.4 | 7.1 | 41 | 79 | 48 | 33 | 3,350 | 35,800 |
| DeKalb DKC 54-51 | 104 | 65.2 | 10.7 | 30.8 | 7.5 | 39 | 78 | 45 | 35 | 3,310 | 35,500 |
| NK N49-E3 | 106 | 65.8 | 10.7 | 31.1 | 8.1 | 41 | 79 | 47 | 33 | 3,320 | 35,300 |
| DeKalb DKC 52-23 | 102 | 60.2 | 10.2 | 25.5 | 6.8 | 36 | 80 | 44 | 41 | 3,440 | 35,000 |
| Pioneer 33N29 | 113 | 67.2 | 10.5 | 32.1 | 7.4 | 41 | 79 | 47 | 33 | 3,320 | 34,900 |
| Epley E1493 | 105 | 65.1 | 10.0 | 28.7 | 7.6 | 37 | 80 | 46 | 39 | 3,440 | 34,500 |
| Pioneer 33D63 | 115 | 68.2 | 10.3 | 32.4 | 8.4 | 42 | 79 | 50 | 32 | 3,340 | 34,400 |
| Epley E5112 | 112 | 66.6 | 10.4 | 31.1 | 7.6 | 40 | 78 | 46 | 35 | 3,260 | 33,800 |
| Dyna-Gro DG53P30 | 92 | 58.3 | 9.7 | 23.1 | 7.0 | 34 | 81 | 43 | 43 | 3,500 | 33,800 |
| High Cycle 7560 | 100 | 61.5 | 9.7 | 25.2 | 7.2 | 36 | 79 | 44 | 40 | 3,430 | 33,300 |
| Mean | | 64.5 | 11.1 | 31.4 | 7.6 | 38 | 80 | 47 | 37 | 3,430 | 38,100 |
| LSD (0.10) | | 1.9 | ns | 3.7 | 0.4 | 3 | ns | 2 | 4 | 230 | ns |

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

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

[3] Milk production was estimated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

***Relative maturity (RM), whole-plant moisture, silage yield and quality traits for corn hybrids planted at Paynesville (Stearns County) in 2005.***

| Brand/Hybrid | RM, Rating | Moisture, % | Yield, Ton/Acre[1] | | Quality (Concentration)[2] % | | | | | Milk Yield[3] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DM | Silage | CP | NDF | IVD | NDFD | Starch | Lb/Ton | Lb/Acre |
| DeKalb DKC 54-51 | 104 | 68.3 | 12.0 | 37.9 | 8.1 | 40 | 80 | 49 | 32 | 3,400 | 40,800 |
| Garst 8689 IT | 104 | 67.4 | 11.3 | 34.5 | 7.9 | 39 | 80 | 49 | 32 | 3,400 | 38,300 |
| DeKalb DKC 50-20 | 100 | 65.0 | 10.8 | 30.7 | 7.5 | 36 | 80 | 45 | 39 | 3,500 | 37,600 |
| Dairyland Stealth 5007 | 103 | 68.5 | 10.6 | 33.7 | 8.8 | 40 | 80 | 51 | 32 | 3,510 | 37,300 |
| Garst 8922 YG1 | 90 | 63.8 | 10.5 | 28.9 | 7.9 | 36 | 81 | 46 | 38 | 3,490 | 36,500 |
| Renk RK632YGCB | 102 | 63.6 | 10.2 | 27.8 | 8.5 | 35 | 82 | 48 | 40 | 3,560 | 36,100 |
| Legacy Seeds L4199 Bt | 101 | 64.3 | 10.5 | 29.4 | 7.9 | 38 | 79 | 45 | 36 | 3,400 | 35,800 |
| NK N49-E3 | 106 | 68.4 | 10.6 | 33.4 | 8.7 | 41 | 79 | 50 | 31 | 3,390 | 35,800 |
| Dyna-Gro CX05798 | 98 | 64.8 | 11.0 | 31.2 | 8.1 | 41 | 78 | 46 | 31 | 3,250 | 35,700 |
| DeKalb DKC 42-95 | 92 | 65.2 | 10.2 | 29.3 | 7.8 | 38 | 79 | 46 | 36 | 3,410 | 34,900 |
| Legacy Seeds L4237 | 100 | 66.3 | 9.9 | 29.4 | 8.3 | 36 | 82 | 50 | 35 | 3,500 | 34,800 |
| Garst 8748 YG1 | 101 | 68.8 | 10.2 | 32.6 | 8.5 | 38 | 80 | 49 | 32 | 3,390 | 34,500 |
| Pioneer 35Y67 | 106 | 68.0 | 10.1 | 31.4 | 8.8 | 40 | 81 | 51 | 28 | 3,420 | 34,400 |
| Renk RK684 | 104 | 68.2 | 10.3 | 32.4 | 9.0 | 40 | 79 | 48 | 29 | 3,330 | 34,400 |
| DeKalb DKC 48-52 | 98 | 63.6 | 9.8 | 26.9 | 7.4 | 36 | 80 | 44 | 38 | 3,420 | 33,500 |
| DeKalb DKC 47-10 | 97 | 62.4 | 9.4 | 24.9 | 7.9 | 35 | 81 | 46 | 41 | 3,550 | 33,300 |
| Producers Hybrids SS96RR | 96 | 64.7 | 10.1 | 28.6 | 7.7 | 41 | 77 | 45 | 33 | 3,250 | 32,900 |
| Pioneer 34M93 | 108 | 68.3 | 10.5 | 33.1 | 8.2 | 45 | 76 | 48 | 28 | 3,120 | 32,700 |
| Pioneer 35D28 | 108 | 68.0 | 10.5 | 32.8 | 7.9 | 44 | 76 | 47 | 31 | 3,110 | 32,700 |
| High Cycle 7560 | 100 | 66.0 | 9.6 | 28.0 | 8.2 | 38 | 80 | 47 | 35 | 3,400 | 32,500 |
| Pioneer 34A86 | 106 | 68.6 | 10.1 | 32.0 | 8.6 | 45 | 77 | 48 | 27 | 3,130 | 31,500 |
| Producers Hybrids 5152RR | 91 | 64.5 | 9.1 | 25.5 | 7.8 | 36 | 80 | 45 | 38 | 3,470 | 31,400 |
| Hyland Seeds HL SR59 | 101 | 68.2 | 11.0 | 34.4 | 8.4 | 45 | 77 | 49 | 23 | 2,860 | 31,400 |
| Hyland Seeds HL S058 | 101 | 68.5 | 10.1 | 32.0 | 8.7 | 43 | 79 | 50 | 25 | 3,090 | 31,200 |
| Legacy Seeds L4987 | 108 | 69.8 | 9.9 | 32.6 | 9.0 | 44 | 78 | 50 | 25 | 3,150 | 31,100 |
| Pioneer 37A92 | 97 | 63.5 | 9.1 | 24.8 | 8.8 | 37 | 80 | 46 | 34 | 3,380 | 30,600 |
| Renk RK452LLYGCB | 94 | 59.6 | 9.3 | 22.9 | 8.1 | 39 | 79 | 45 | 35 | 3,270 | 30,200 |
| Legacy Seeds L3877 Bt/LL | 95 | 58.3 | 9.3 | 22.2 | 8.1 | 38 | 79 | 44 | 36 | 3,240 | 30,000 |
| Dairyland Stealth 1705 | 101 | 69.3 | 9.6 | 31.7 | 8.4 | 44 | 77 | 48 | 25 | 3,130 | 30,000 |
| Garst 8769 Bt | 99 | 61.3 | 8.9 | 23.0 | 7.8 | 39 | 80 | 47 | 34 | 3,330 | 29,700 |
| Hyland Seeds HL S047 | 100 | 65.3 | 9.0 | 26.0 | 8.5 | 40 | 79 | 46 | 34 | 3,270 | 29,500 |
| Legacy Seeds L3077 Bt | 95 | 67.9 | 9.2 | 28.6 | 7.6 | 41 | 77 | 44 | 32 | 3,190 | 29,400 |
| Garst 8881 RR | 95 | 64.3 | 8.6 | 24.1 | 7.8 | 38 | 79 | 45 | 35 | 3,360 | 29,000 |
| NK N33-H6 | 101 | 67.2 | 9.5 | 28.8 | 8.7 | 42 | 77 | 46 | 28 | 3,050 | 28,800 |
| Hyland Seeds HL S067 | 103 | 68.5 | 9.5 | 30.1 | 8.9 | 45 | 76 | 47 | 26 | 3,020 | 28,600 |
| Dairyland Stealth 1602 | 98 | 67.6 | 9.0 | 27.9 | 8.9 | 43 | 77 | 48 | 29 | 3,160 | 28,500 |
| Dyna-Gro 55F16 | 101 | 66.4 | 9.0 | 26.7 | 8.2 | 42 | 77 | 44 | 30 | 3,110 | 27,900 |
| Dairyland Stealth HiDF-4200 | 101 | 69.1 | 8.3 | 26.9 | 8.9 | 40 | 78 | 46 | 34 | 3,280 | 27,300 |
| Hyland Seeds HL 2676 | 101 | 69.2 | 7.4 | 23.9 | 8.9 | 43 | 78 | 48 | 31 | 3,220 | 23,800 |
| Mean | | 66.2 | 9.8 | 29.3 | 8.3 | 40 | 79 | 47 | 32 | 3,290 | 32,400 |
| LSD (0.10) | | 2.4 | 1.5 | 4.1 | 0.6 | 3 | 2 | 2 | 4 | 220 | 5,900 |

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

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

[3] Milk production was estimated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

***Relative maturity (RM), whole-plant moisture, silage yield and quality traits for corn hybrids planted at Melrose (Stearns County) in 2005.***

| Brand/Hybrid | RM, Rating | Moisture, % | Yield, Ton/Acre[1] | | Quality (Concentration)[2] % | | | | | Milk Yield[3] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DM | Silage | CP | NDF | IVD | NDFD | Starch | Lb/Ton | Lb/Acre |
| Legacy Seeds L4199 Bt | 101 | 65.2 | 9.1 | 26.1 | 9.2 | 38 | 84 | 57 | 34 | 3,540 | 32,200 |
| Garst 8748 YG1 | 101 | 70.0 | 8.5 | 28.4 | 10.0 | 36 | 86 | 62 | 34 | 3,710 | 31,700 |
| Hyland Seeds HL 2676 | 101 | 68.9 | 8.1 | 26.1 | 9.7 | 38 | 84 | 59 | 35 | 3,610 | 29,300 |
| DeKalb DKC 54-51 | 104 | 69.2 | 8.0 | 26.1 | 9.1 | 37 | 85 | 58 | 34 | 3,530 | 28,400 |
| DeKalb DKC 50-20 | 100 | 70.2 | 7.2 | 24.0 | 10.1 | 33 | 88 | 63 | 39 | 3,930 | 28,100 |
| Pioneer 34M93 | 108 | 71.9 | 8.1 | 28.8 | 9.2 | 41 | 83 | 57 | 31 | 3,430 | 27,700 |
| Pioneer 34A86 | 106 | 70.6 | 8.0 | 27.3 | 10.3 | 40 | 84 | 61 | 28 | 3,410 | 27,400 |
| Pioneer 35D28 | 108 | 71.7 | 8.5 | 29.9 | 9.4 | 44 | 81 | 57 | 27 | 3,230 | 27,300 |
| Dairyland Stealth HiDF-4200 | 101 | 70.3 | 7.1 | 24.0 | 10.3 | 37 | 86 | 62 | 35 | 3,790 | 27,000 |
| Renk RK632YGCB | 102 | 68.8 | 7.4 | 23.6 | 10.8 | 38 | 86 | 63 | 31 | 3,650 | 26,900 |
| Garst 8689 IT | 104 | 69.4 | 7.8 | 25.3 | 8.0 | 37 | 84 | 58 | 32 | 3,460 | 26,800 |
| Dyna-Gro 55F16 | 101 | 69.3 | 7.3 | 23.7 | 9.9 | 38 | 85 | 59 | 33 | 3,630 | 26,500 |
| High Cycle 7560 | 100 | 69.8 | 7.4 | 24.5 | 10.7 | 40 | 84 | 61 | 34 | 3,580 | 26,500 |
| Hyland Seeds HL S067 | 103 | 68.3 | 7.6 | 23.8 | 10.0 | 43 | 83 | 59 | 28 | 3,480 | 26,300 |
| DeKalb DKC 48-52 | 98 | 65.8 | 7.3 | 21.2 | 9.2 | 37 | 84 | 56 | 35 | 3,580 | 26,000 |
| Pioneer 37A92 | 97 | 65.7 | 6.4 | 18.6 | 10.8 | 33 | 88 | 63 | 37 | 3,930 | 25,100 |
| Hyland Seeds HL S058 | 101 | 70.5 | 7.2 | 24.2 | 11.2 | 48 | 83 | 64 | 22 | 3,410 | 24,400 |
| Dairyland Stealth 5007 | 103 | 73.9 | 6.9 | 26.3 | 10.4 | 42 | 83 | 61 | 35 | 3,540 | 24,300 |
| DeKalb DKC 47-10 | 97 | 68.4 | 6.7 | 21.0 | 9.8 | 36 | 86 | 61 | 34 | 3,640 | 24,200 |
| Legacy Seeds L3877 Bt/LL | 95 | 65.7 | 6.5 | 18.8 | 10.1 | 36 | 86 | 60 | 34 | 3,750 | 24,200 |
| Pioneer 35Y67 | 106 | 74.1 | 7.3 | 28.2 | 10.0 | 42 | 83 | 60 | 26 | 3,280 | 24,000 |
| Renk RK684 | 104 | 72.9 | 6.8 | 25.0 | 11.5 | 43 | 84 | 63 | 27 | 3,540 | 24,000 |
| Garst 8769 Bt | 99 | 66.7 | 6.9 | 20.6 | 9.9 | 40 | 83 | 58 | 34 | 3,460 | 23,800 |
| Producers Hybrids SS96RR | 96 | 69.8 | 6.7 | 22.2 | 10.7 | 43 | 83 | 61 | 26 | 3,490 | 23,400 |
| Hyland Seeds HL SR59 | 101 | 73.5 | 7.0 | 26.2 | 11.1 | 48 | 83 | 64 | 26 | 3,370 | 23,400 |
| Legacy Seeds L4987 | 108 | 71.1 | 7.2 | 25.0 | 10.4 | 47 | 81 | 60 | 23 | 3,230 | 23,400 |
| DeKalb DKC 42-95 | 92 | 70.6 | 6.6 | 22.4 | 9.8 | 38 | 85 | 60 | 30 | 3,550 | 23,300 |
| Hyland Seeds HL S047 | 100 | 67.1 | 6.5 | 19.6 | 10.3 | 38 | 85 | 60 | 33 | 3,610 | 23,300 |
| Garst 8922 YG1 | 90 | 72.0 | 7.1 | 25.2 | 9.9 | 41 | 83 | 59 | 26 | 3,290 | 23,200 |
| Producers Hybrids 5152RR | 91 | 69.8 | 6.3 | 20.8 | 9.8 | 37 | 85 | 61 | 31 | 3,590 | 22,500 |
| Legacy Seeds L3077 Bt | 95 | 71.0 | 6.3 | 21.6 | 9.2 | 38 | 84 | 58 | 34 | 3,580 | 22,500 |
| Legacy Seeds L4237 | 100 | 71.8 | 6.4 | 22.7 | 9.4 | 39 | 84 | 59 | 31 | 3,490 | 22,300 |
| Dairyland Stealth 1705 | 101 | 71.0 | 6.7 | 23.1 | 9.8 | 44 | 82 | 58 | 27 | 3,290 | 22,100 |
| Renk RK452LLYGCB | 94 | 67.6 | 6.3 | 19.3 | 11.1 | 40 | 84 | 61 | 28 | 3,510 | 22,000 |
| NK N33-H6 | 101 | 71.3 | 6.3 | 21.8 | 10.9 | 41 | 83 | 59 | 27 | 3,480 | 21,800 |
| Dyna-Gro CX05798 | 98 | 71.3 | 6.3 | 22.1 | 10.4 | 44 | 83 | 61 | 29 | 3,440 | 21,800 |
| NK N49-E3 | 106 | 75.8 | 6.1 | 25.3 | 11.4 | 44 | 84 | 65 | 28 | 3,530 | 21,600 |
| Dairyland Stealth 1602 | 98 | 71.0 | 5.9 | 20.2 | 11.2 | 45 | 82 | 61 | 24 | 3,360 | 19,600 |
| Garst 8881 RR | 95 | 69.4 | 5.7 | 18.4 | 9.1 | 38 | 83 | 56 | 32 | 3,440 | 19,400 |
| Mean | | 70.0 | 7.0 | 23.6 | 10.1 | 40 | 84 | 60 | 31 | 3,520 | 24,800 |
| LSD (0.10) | | 2.7 | 1.2 | 3.6 | 0.8 | 4 | 2 | 4 | 4 | 270 | 5,200 |

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

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

[3] Milk production was estimated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

***Relative maturity (RM), whole-plant moisture, silage yield and quality traits for corn hybrids planted at Ottertail (Otter Tail County) in 2005.***

| Brand/Hybrid | RM, Rating | Moisture, % | Yield, Ton/Acre[1] | | Quality (Concentration)[2] % | | | | | Milk Yield[3] | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | DM | Silage | CP | NDF | IVD | NDFD | Starch | Lb/Ton | Lb/Acre |
| Pioneer 38H69 | 100 | 66.6 | 6.3 | 19.0 | 7.7 | 39 | 81 | 52 | 35 | 3,520 | 22,300 |
| Dekalb DKC 42-95 | 92 | 63.9 | 6.1 | 17.0 | 7.1 | 37 | 81 | 50 | 40 | 3,610 | 22,100 |
| Pioneer 37R70 | 99 | 64.9 | 6.1 | 17.4 | 8.0 | 38 | 82 | 51 | 36 | 3,570 | 21,800 |
| Dyna Gro CX05798 | 98 | 62.8 | 6.7 | 17.9 | 7.2 | 42 | 79 | 49 | 33 | 3,260 | 21,700 |
| Hyland HLS058 | 101 | 66.7 | 6.7 | 20.0 | 7.8 | 42 | 79 | 50 | 31 | 3,250 | 21,700 |
| Pioneer 38W22 | 92 | 62.8 | 6.1 | 16.4 | 7.5 | 38 | 81 | 51 | 35 | 3,490 | 21,300 |
| Nu Tech QFO193 | 93 | 63.8 | 6.6 | 18.3 | 7.1 | 43 | 77 | 48 | 32 | 3,170 | 21,000 |
| Pioneer 37A92 | 97 | 62.6 | 5.8 | 15.5 | 7.9 | 37 | 82 | 52 | 37 | 3,580 | 20,800 |
| Dekalb DKC 40-05 | 90 | 63.7 | 6.0 | 16.5 | 7.2 | 40 | 79 | 48 | 35 | 3,380 | 20,200 |
| Nu Tech QFO100 | 100 | 69.7 | 6.4 | 21.0 | 7.4 | 44 | 79 | 52 | 27 | 3,130 | 19,900 |
| Dyna Gro 55F53 | 102 | 67.0 | 6.3 | 19.0 | 7.2 | 43 | 77 | 45 | 33 | 3,120 | 19,600 |
| NK Seeds N33-H6 | 93 | 68.6 | 6.3 | 20.2 | 7.3 | 44 | 78 | 50 | 27 | 3,090 | 19,600 |
| Hyland HLS009 | 73 | 52.7 | 6.0 | 12.7 | 7.4 | 39 | 80 | 48 | 35 | 3,220 | 19,300 |
| Mean | | 64.3 | 6.3 | 17.8 | 7.4 | 40 | 80 | 50 | 33 | 3,340 | 20,900 |
| LSD (0.10) | | 2.0 | ns | 2.2 | 0.4 | 3 | 2 | 2 | 3 | 180 | ns |

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

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

[3] Milk production was estimated using spreadsheet MILK2000 developed at the University of Wisconsin. Refer to Results Provided text for additional information.

Minnesota Agricultural Experiment Station
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# Oat

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## Varietal Trials Results, January 2006

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; this certainly was true in 2005 for southern Minnesota, many parts of the Midwest and much of Canada.

A detailed interpretation of our crown rust data follows. Because we experienced some changes in rust races in 2005, many of the varieties currently grown are now susceptible to crown rust.

In the disease-data table we divided the crown rust readings into two columns. The first column gives a numerical value for the varieties with some resistance, which predicts the relative proportion of rust spores that will achieve a successful infection. The "Reaction Type" column values relate to the size of the pustule, which indicates how much the pustule is restricted by the host reaction. A small and/or restricted pustule produces fewer spores for reinfection, a major factor in the ultimate level of rust infection.

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

Treated seed should be used for smut-susceptible varieties, and those with BYDV (red leaf) susceptibility (score of 7 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 2.7 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; later varieties usually have an advantage in the north.

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

## *General-Purpose Varieties*

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

**Drumlin**–Late maturity, high yield, medium height, average lodging resistance, below-average test weight and groat percentage, yellow seed. Susceptible to crown rust and resistant to smut, good tolerance to red leaf. Selected at Wis. AES. Released in 2003. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (94)**

**Esker**–Medium maturity, high yield, medium height, average lodging resistance, average test weight and groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, good tolerance to red leaf. Selected at Wis. AES. Released in 2003. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (pending)**

**Gem**–Medium-late maturity, medium yield, medium height, average lodging resistance, fair test weight and groat percentage. Yellow seed. Susceptible to crown rust, moderately resistant to 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 (94)**

**HiFi**–Late maturity, high yield, tall, good lodging resistance, high test weight, medium groat percentage. White seed. Resistance to crown rust, moderately susceptible to smut, some tolerance to red leaf.

Selected at N.D. AES. Released in 2001. **PVP (94)**

**Kame**–Early maturity, very high yield, short, very good lodging resistance, fair test weight, good groat percentage. Yellow seed. Selected at Wis. AES. Released in 2004. Foundation seed available to certified seed producers only under a license/fee collection agreement. **PVP (pending)**

**Leonard**–Late maturity, fair yield, medium height, fair lodging resistance, poor test weight and groat percentage. Yellow seed. Susceptible to crown rust and smut. Good tolerance to red leaf. Selected at Minn. AES. Released in 2002.

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

**Morton**–Late maturity, high yield, tall, very good lodging resistance, very high test weight, medium groat percentage. Ivory seed. Good resistance to crown rust and smut, some tolerance to red leaf. Selected at N.D. AES. Released in 2001. **PVP (94)**

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

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

***Oat traits, 2003-2005.***

| Variety | Days After Planting To Heading | Height, Inches | Lodging, 1 = Erect 5 = Flat | Test Weight, Lb/Bu | Groat % |
|---|---|---|---|---|---|
| Winona | 62 | 36 | 3.0 | 39.8 | 71.2 |
| Reeves | 63 | 40 | 3.7 | 41.6 | 71.2 |
| Kame | 64 | 36 | 1.8 | 38.3 | 71.7 |
| Esker | 65 | 37 | 2.5 | 39.3 | 70.4 |
| Moraine | 65 | 38 | 2.9 | 39.6 | 72.0 |
| Richard | 65 | 41 | 2.9 | 38.7 | 69.1 |
| Gem | 67 | 39 | 2.7 | 38.4 | 69.3 |
| Wabasha | 67 | 38 | 2.8 | 37.8 | 71.2 |
| Morton | 68 | 44 | 1.6 | 41.1 | 70.6 |
| Sesqui | 69 | 38 | 3.1 | 37.8 | 65.0 |
| HiFi | 69 | 41 | 2.0 | 41.4 | 70.3 |
| Drumlin | 69 | 38 | 2.5 | 38.7 | 69.5 |
| Leonard | 69 | 39 | 3.5 | 35.7 | 67.5 |
| Mean | 66 | 39 | 2.7 | 39.1 | 69.9 |

***Oat yield, (percent of mean) off-station locations, 2005 only.***

| Variety | Winona[1] | Wells[1] | Madison[1] | Stephen |
|---|---|---|---|---|
| Winona | 101 | 112 | 132 | NA |
| Reeves | 105 | 68 | 55 | 56 |
| Kame | 81 | 105 | 171 | 112 |
| Esker | 140 | 135 | 119 | 88 |
| Moraine | 90 | 116 | 133 | 107 |
| Richard | 77 | 113 | 109 | 67 |
| Gem | 123 | 123 | 75 | 131 |
| Wabasha | 100 | 73 | 51 | 90 |
| Morton | NA | NA | NA | 99 |
| Sesqui | 84 | 57 | 56 | 91 |
| HiFi | NA | NA | NA | 125 |
| Drumlin | NA | NA | NA | 149 |
| Leonard | NA | NA | NA | 87 |
| Location Mean (Bu/Acre) | 54 | 54 | 35 | 66 |
| LSD (0.05) | 52.0 | 37.7 | 45.2 | 35.3 |

[1] Organic, reduced-pesticide locations.

**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.

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

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

**Winona**–Early, medium yield, short, fair lodging resistance, medium test weight, good groat percentage. Yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Minn. AES. Released in 2005.

***Oat yield, percent of mean, by location, 2003-2005.***

| Variety | Rosemount | Waseca | Lamberton | Morris | Crookston | Average of 5 locations |
|---|---|---|---|---|---|---|
| Winona | 90 | 90 | 92 | 99 | 90 | 92 |
| Reeves | 95 | 87 | 91 | 72 | 84 | 86 |
| Kame | 116 | 117 | 114 | 114 | 113 | 115 |
| Esker | 105 | 109 | 105 | 103 | 105 | 106 |
| Moraine | 96 | 91 | 86 | 102 | 94 | 94 |
| Richard | 94 | 95 | 88 | 90 | 92 | 91 |
| Gem | 95 | 95 | 93 | 100 | 92 | 95 |
| Wabasha | 87 | 100 | 92 | 87 | 97 | 93 |
| Morton | 116 | 112 | 120 | 103 | 102 | 111 |
| Sesqui | 81 | 81 | 102 | 99 | 101 | 93 |
| HiFi | 113 | 105 | 111 | 106 | 106 | 108 |
| Drumlin | 101 | 100 | 103 | 118 | 109 | 106 |
| Leonard | 78 | 80 | 85 | 89 | 93 | 85 |
| Location Mean (Bu/Acre) | 86 | 91 | 96 | 107 | 135 | 103 |
| LSD (0.05) | 8.5 | 8.4 | 9.2 | 9.1 | 7.7 | 3.7 |

***Disease data in single year (2005).***

| Variety | Crown Rust: Amount Infected[1] | Crown Rust: Reaction, Type[2] | Smut Score[3] | BYDV Score[4] |
|---|---|---|---|---|
| Winona | >20 | S | R | 6 |
| Reeves | 6 | MS-S | MS | 7 |
| Kame | 5 | MS-MR | R | 7 |
| Esker | >20 | S | R | 5 |
| Moraine | >20 | S | R | 6 |
| Richard | >20 | S | R | 6 |
| Gem | >20 | S | MR | 4 |
| Wabasha | >20 | S | R | 6 |
| Morton | 8 | MS-S | R | 6 |
| Sesqui | >20 | S | R | 5 |
| HiFi | 1 | MS | MS | 6 |
| Drumlin | >20 | S | R | 4 |
| Leonard | >20 | S | R | 4 |

[1] Relative proportion of rust spores that will achieve a successful infection; varieties with high scores labeled as ">20." The lower the score the better.
[2] R = resistant, MR = moderately resistant, MS = moderately susceptible and S = susceptible.
[3] Artificially innoculated, R = resistant, MR = moderately resistant, MS = moderately susceptible and S = susceptible.
[4] Barley Yellow Dwarf Virus score from Urbana, Ill., with 1 = no symptoms and 9 = dead.

## Special-Purpose Varieties

These varieties also are adequately tested three years or more. They have special attributes that differentiate them from general-purpose varieties or are intended for a specific end use.

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

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


**Oat trial locations.**

***Oat Planting Rate and Date***

Bushel Weight, Pounds.....32

Seeds/Pound.....16,200

Planting Rate, Pounds/Acre.....80

Planting Rate, Seeds/Sq. Ft..... 28

Planting Date.....Early Spring

Minnesota Agricultural Experiment Station
University of Minnesota

# Hard Red Spring Wheat

J.A. Anderson, G.L. Linkert and J.J. Wiersma

## Varietal Trials Results, January 2006

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

### Variety Selection Criteria

While grain yield is an important economic trait, return per acre also is affected by grain quality. Fusarium Head Blight (FHB), or scab, is an important consideration because it can dramatically reduce grain quality and yield.

The foliar disease rating, which represents the total complex of leaf diseases other than leaf rust, includes the Septoria complex and tan spot. Although varieties may differ for their response to each of those diseases, the rating does not differentiate among them. Consequently, the rating should be used as a general indication and only for varietal selection in areas where these diseases have been a problem or if the previous crop was wheat or barley.

Control of leaf diseases with fungicides may be warranted, even for varieties with an above-average rating.

The varietal response to FHB is presented as a severity rating, similar to the rating for leaf and stem rust. Resistance to spread in the head, the basis for this severity rating, is one of the resistance mechanisms to the disease. A second rating is provided to characterize ability to maintain sound, plump kernels despite visual disease symptoms on the head. This ability to maintain sound kernels, and thus test weight is another component to resistance.

Variety selection for 2006 continues to be a balance between yield potential, disease responses and grain quality. Leading varieties in Minnesota, based on acres planted, include Oxen, Knudson, Oklee, Granite, Briggs and Alsen. New releases for 2005 are Glenn (NDSU) and Ulen (MN). The variety Express was tested for the first time in the 2005 Minnesota variety trial.

Leaf rust continues to be a yearly problem on varieties with ratings of MS or worse. Varieties with ratings of MR or better should not experience economic levels of damage to this fungus in most years.

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

Falling number data, an important end-use quality trait that can be determined at most local elevators, has been added to the grain-quality table. Falling number is measured in seconds, and values of 300 or higher are required for milling quality wheat. Falling number is related to preharvest sprouting because sprouted grain will always have low falling numbers. In the absence of visual sprouting, falling numbers are generally greater than 400, except in certain varieties.

Due to the increasing popularity of fungicide applications on wheat, we have been testing varietal response to application of fungicides at the time of herbicide application (Feekes 5), flag leaf emergence (Feekes 9), and at flowering (Feekes 10.51).

The practice of three fungicide applications during the growing season is not recommended. This fungicide regime was implemented to measure the varieties' yield potential when fungal diseases were controlled.

Growers' decisions regarding fungicide application should be based on the available decision support systems, and only if and when disease levels are forecasted to reach

economic damaging levels. These tests were carried out in the same field as the conventional (no-fungicide-applied) trials, so the results can be compared directly.

Three locations (Crookston, Morris and Roseau) and two locations (Crookston and Morris) were included in the conventional vs. intensive comparison in 2004 and 2005, respectively. Over the two years, there was a 5- to 8-bushel/acre yield increase in response to fungicide treatment.

Varieties most susceptible to leaf and stripe rust diseases benefited most from the fungicide applications.

Variety descriptions published in editions prior to 2005 have been discontinued because all of the information they contained is now included in the tables.

***Origin, characteristics, and disease reactions of hard red spring wheat varieties.***

| Variety | Origin[1] | PVP Status[2] | Days to Heading[3] | Height cm[3] | Straw Strength[4] | Leaf Rust[5] | Stripe Rust[5] | Other Leaf Diseases[5] | Scab Disease Severity[5] | Scab Grain Soundness[6] |
|---|---|---|---|---|---|---|---|---|---|---|
| Oklee | 2003 MN | PVP (94) | 64 | 80 | Medium | MR-MS | R | MR | MR-MS | 2.5 |
| Glenn | 2005 NDSU | PVP (pnd) | 64 | 87 | Strong | R | R | — | MR | 1.5 |
| Ulen | 2005 MN | PVP (pnd) | 64 | 81 | Medium | MR | R | MR-MS | MS | 3.5 |
| Trooper | 2004 Westbred | PVP (pnd) | 65 | 75 | V Strg | MR | MS-S | — | MR-MS | 2.5 |
| Briggs | 2002 SDSU | PVP (94) | 65 | 83 | Medium | R | R | MR | MR-MS | 3.0 |
| Walworth | 2001 SDSU | PVP (94) | 65 | 84 | Medium | MS | MS | MS-S | MR-MS | 2.5 |
| Banton | 2004 Trigen | PVP (pnd) | 65 | 83 | Strong | R-MR | R | — | MR-MS | 2.5 |
| Granger | 2004 SDSU | PVP (94) | 65 | 88 | Medium | MR | R | MR | MR-MS | 2.5 |
| Dapps | 2003 NDSU | PVP (94) | 66 | 92 | Medium | R | MR | MR-R | MS | 3.0 |
| Oxen | 1995 SDSU | PVP (94) | 66 | 79 | M Strg | MS-S | R | MS | MS-S | 3.0 |
| Express | 1992 Westbred | PVP (94) | 66 | 68 | V Strg | MR | R | — | — | — |
| Steele-ND | 2004 NDSU | PVP (94) | 66 | 81 | Medium | R | R | MR | MS | 2.5 |
| Reeder | 1999 NDSU | PVP (94) | 66 | 79 | Strong | MS-S | R | MR | MS | 3.5 |
| Mercury | 1999 N. Star G. | PVP (94) | 66 | 72 | Strong | MR | R | MR-R | S | 5.0 |
| Parshall | 1999 NDSU | PVP (94) | 67 | 90 | Strong | MS-S | R | MR-R | MR-MS | 2.0 |
| Alsen | 2000 NDSU | PVP (94) | 67 | 82 | Strong | MR | R | MR-MS | MR | 2.0 |
| Knudson | 2001 AgriPro | PVP (94) | 67 | 79 | M Strg | R | MR | MR-R | MR-MS | 2.5 |
| Freyr | 2004 AgriPro | PVP (94) | 67 | 82 | Medium | MR-MS | R | — | MR | 2.0 |
| Hanna | 2002 AgriPro | PVP (94) | 68 | 91 | M Strg | MS-S | R | MR-MS | MR | 2.0 |
| Norpro | 1999 AgriPro | PVP (94) | 69 | 75 | Strong | MR-MS | MR | MR-R | MS | 3.5 |
| Granite | 2002 Westbred | PVP (94) | 69 | 78 | V Strg | MS | MR | MR-MS | MR-MS | 2.5 |
| Marshall | 1982 MN | — | 71 | 77 | Strong | S | R | MS | MS | 3.5 |
| Saturn | 2004 N. Star G. | PVP (94) | 72 | 87 | V Strg | MR-MS | R | — | MS | 3.5 |
| Polaris | 2004 N. Star G. | PVP (94) | 73 | 85 | V Strg | MS | R | — | MS | 3.5 |
| Mean | | | 67 | 94 | | | | | | |

1 Abbreviations: MN = Minnesota Agricultural Expt. Station and USDA-ARS, North Station; N. Star G. = North Star Genetics; NDSU = North Dakota State University Research foundation; SDSU = South Dakota Agricultural Expt. Stn.; Trigen = Trigen Seed Services LLC.

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

3 2005 data. Days to heading is approximate because not all locations are included.

4 2002-2005 data.

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

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

***Grain quality of hard red spring wheat varieties.***

| | Test Weight (Lb/Bu) | | Protein (%)[1] | | Baking | Falling | Pre-Harvest |
|---|---|---|---|---|---|---|---|
| Variety | 2005 | 2-Year | 2005 | 2-Year | Quality[2] | Number[3] | Sprouting |
| Oklee | 59.8 | 60.4 | 15.2 | 15.0 | Low-Med. | 6,0,0,1 | R |
| Glenn | 61.5 | 62.0 | 15.9 | 15.5 | — | — | R |
| Ulen | 58.5 | 59.3 | 15.2 | 15.0 | Med. | 6,1,0,0 | MS |
| Trooper | 59.9 | 59.9 | 14.4 | 14.1 | — | — | R |
| Briggs | 59.5 | 60.1 | 14.9 | 14.8 | Med. | 5,1,1,0 | R |
| Walworth | 58.1 | 58.4 | 14.8 | 14.6 | Med.-High | 6,1,0,0 | R |
| Banton | 60.9 | 60.9 | 14.6 | 14.6 | — | 6,0,0,1 | — |
| Granger | 59.2 | 59.6 | 14.8 | 14.7 | — | 4,3,0,0 | MR |
| Dapps | 57.6 | 58.8 | 16.3 | 16.0 | High | 4,2,1,0 | R |
| Oxen | 55.6 | 56.7 | 14.6 | 14.5 | High-Med. | 5,2,0,0 | R |
| Express | 55.4 | — | 14.7 | — | — | — | — |
| Steele-ND | 59.8 | 60.6 | 15.4 | 15.3 | — | 7,0,0,0 | R |
| Reeder | 56.7 | 58.3 | 14.0 | 14.2 | Med.-High | 7,0,0,0 | R |
| Mercury | 57.5 | 58.6 | 14.7 | 14.2 | Med. | 4,2,1,0 | MS |
| Parshall | 60.2 | 60.7 | 14.9 | 14.7 | High-Med. | 7,0,0,0 | R |
| Alsen | 59.7 | 60.1 | 15.4 | 15.1 | High | 7,0,0,0 | R |
| Knudson | 59.1 | 59.5 | 14.5 | 14.3 | Med.-High | 5,2,0,0 | R |
| Freyr | 58.5 | 58.8 | 14.9 | 14.7 | — | — | R |
| Hanna | 58.8 | 59.5 | 14.9 | 14.7 | High | 5,2,0,0 | R |
| Norpro | 56.8 | 57.5 | 14.8 | 14.5 | Med. | 6,0,1,0 | R |
| Granite | 60.4 | 61.1 | 15.4 | 15.4 | Med.Low | 3,3,1,0 | R |
| Marshall | 54.8 | 55.9 | 14.1 | 13.9 | Low | 5,2,0,0 | R |
| Saturn | 55.5 | 56.2 | 15.4 | 15.2 | — | — | R |
| Polaris | 57.2 | 58.0 | 13.9 | 13.6 | — | — | R |
| Mean | 58.7 | 59.2 | 14.4 | 14.7 | | | |

[1] 12% moisture basis.

[2] 2001-2003 crop years.

[3] Falling Number is the number of trials in which the variety had falling numbers greater than 400, 350-400, 300-350, and less than 250. Based on 7 environments in 2003 and 2004. A variety that had falling numbers of greater than 400 in all 7 environments (i.e., 7,0,0,0) is best.

### *Hard Red Spring Wheat Planting Rate and Date.*

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

The general formula for calculating a seeding rate is:

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

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

***Example: Early variety.***

| Desired Stand, (Plants/Acre) | Expected Stand Loss | Seeds per Pound | Percentage Germination | Seeding Rate, (Lb/Acre) |
|---|---|---|---|---|
| 1.25 million | 0.20 | 14,000 | 0.95 | 113 |

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

| | Crookston | | | Roseau[1] | Stephen | | |
|---|---|---|---|---|---|---|---|
| Variety | 2005 | 2-Year | 3-Year | 2-Year | 2005 | 2-Year | 3-Year |
| Oklee | 109 | 103 | 101 | 99 | 99 | 101 | 99 |
| Glenn | 103 | 101 | – | 104 | 109 | 102 | – |
| Ulen | 98 | 93 | 99 | 108 | 87 | 91 | 92 |
| Trooper | 95 | 100 | – | – | 101 | 106 | – |
| Briggs | 97 | 97 | 95 | 110 | 92 | 97 | 100 |
| Walworth | 98 | 100 | 98 | 101 | 115 | 108 | 103 |
| Banton | 95 | 100 | – | – | 100 | 101 | – |
| Granger | 117 | 99 | 95 | 97 | 116 | 110 | 106 |
| Dapps | 96 | 95 | 96 | 100 | 93 | 90 | 93 |
| Oxen | 100 | 92 | 92 | 103 | 106 | 100 | 99 |
| Express | 82 | – | – | – | 84 | – | – |
| Steele-ND | 100 | 95 | 97 | 99 | 95 | 99 | 103 |
| Reeder | 82 | 85 | 87 | 102 | 87 | 93 | 97 |
| Mercury | 96 | 97 | 99 | 109 | 111 | 110 | 105 |
| Parshall | 86 | 84 | 89 | 98 | 86 | 88 | 87 |
| Alsen | 98 | 101 | 98 | 96 | 91 | 92 | 94 |
| Knudson | 115 | 115 | 111 | 98 | 111 | 105 | 105 |
| Freyr | 111 | 106 | – | 94 | 119 | 101 | – |
| Hanna | 104 | 102 | 101 | 94 | 95 | 97 | 99 |
| Norpro | 101 | 101 | 98 | 96 | 96 | 98 | 101 |
| Granite | 109 | 110 | 105 | 98 | 101 | 96 | 98 |
| Marshall | 91 | 89 | 92 | 88 | 75 | 85 | 92 |
| Saturn | 112 | 104 | – | – | 94 | 100 | – |
| Polaris | 123 | 115 | – | – | 138 | 121 | – |
| Mean (Bu/Acre) | 62.3 | 74.5 | 77.3 | 91.3 | 83.3 | 77.4 | 76.5 |
| LSD | 11.7 | 15.5 | 13.2 | 17.2 | 17.7 | 25.9 | 14.8 |

[1]Roseau was abandoned in 2005 due to flooding. The 2-year data are 2003 and 2004.

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

| | Lamberton | | | Morris | | | St. Paul | | | Waseca | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variety | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year |
| Oklee | 117 | 106 | 103 | 99 | 103 | 97 | 95 | 99 | 94 | 126 | 114 | 110 |
| Glenn | 91 | 89 | — | 87 | 95 | — | 123 | 113 | — | 119 | 104 | — |
| Ulen | 115 | 109 | 104 | 101 | 102 | 101 | 114 | 121 | 112 | 131 | 127 | 120 |
| Trooper | 71 | 81 | — | 112 | 98 | — | 102 | 116 | — | 79 | 83 | — |
| Briggs | 118 | 108 | 104 | 118 | 113 | 105 | 105 | 101 | 99 | 109 | 105 | 102 |
| Walworth | 110 | 106 | 102 | 116 | 98 | 102 | 111 | 107 | 108 | 119 | 113 | 108 |
| Banton | 112 | 100 | — | 107 | 106 | — | 102 | 105 | — | 102 | 93 | — |
| Granger | 122 | 115 | 110 | 105 | 107 | 102 | 95 | 96 | 97 | 155 | 123 | 118 |
| Dapps | 127 | 117 | 107 | 93 | 99 | 94 | 109 | 104 | 101 | 104 | 106 | 102 |
| Oxen | 76 | 81 | 91 | 78 | 86 | 96 | 70 | 89 | 97 | 103 | 100 | 103 |
| Express | 117 | — | — | 104 | — | — | 119 | — | — | 74 | — | — |
| Steele-ND | 126 | 113 | 109 | 98 | 99 | 99 | 131 | 126 | 115 | 126 | 119 | 112 |
| Reeder | 59 | 75 | 85 | 78 | 92 | 98 | 108 | 111 | 110 | 84 | 91 | 93 |
| Mercury | 152 | 133 | 123 | 152 | 132 | 126 | 126 | 131 | 123 | 128 | 126 | 119 |
| Parshall | 84 | 74 | 75 | 90 | 87 | 88 | 95 | 105 | 106 | 97 | 86 | 90 |

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

| | Lamberton | | | Morris | | | St. Paul | | | Waseca | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variety | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year |
| Alsen | 84 | 89 | 91 | 104 | 101 | 97 | 100 | 93 | 94 | 92 | 91 | 89 |
| Knudson | 89 | 102 | 106 | 113 | 115 | 111 | 127 | 116 | 114 | 101 | 111 | 111 |
| Freyr | 122 | 115 | — | 109 | 108 | — | 89 | 96 | — | 101 | 101 | — |
| Hanna | 103 | 107 | 98 | 96 | 92 | 93 | 62 | 70 | 79 | 86 | 80 | 84 |
| Norpro | 82 | 95 | 101 | 100 | 97 | 98 | 66 | 70 | 82 | 92 | 98 | 99 |
| Granite | 120 | 116 | 118 | 101 | 99 | 103 | 93 | 95 | 96 | 90 | 94 | 97 |
| Marshall | 36 | 57 | 69 | 48 | 59 | 73 | 46 | 45 | 60 | 30 | 47 | 61 |
| Saturn | 112 | 102 | — | 101 | 101 | — | 121 | 125 | — | 98 | 102 | — |
| Polaris | 59 | 78 | — | 85 | 97 | — | 99 | 102 | — | 70 | 81 | — |
| Mean (Bu/Acre) | 35.8 | 45.4 | 47.2 | 43.6 | 63.3 | 68.2 | 51.0 | 58.9 | 67.8 | 39.8 | 52.9 | 65.0 |
| LSD | 31.0 | 25.9 | 22.5 | 23.7 | 21.8 | 20.4 | 18.7 | 22.1 | 20.6 | 23.9 | 25.9 | 16.8 |

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

| | State | | | North | | | South | | |
|---|---|---|---|---|---|---|---|---|---|
| Variety | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3 -Year |
| Oklee | 108 | 104 | 101 | 104 | 102 | 100 | 109 | 106 | 101 |
| Glenn | 105 | 101 | — | 106 | 102 | — | 105 | 100 | — |
| Ulen | 108 | 108 | 105 | 92 | 97 | 99 | 115 | 115 | 110 |
| Trooper | 94 | 96 | — | 98 | 98 | — | 91 | 95 | — |
| Briggs | 107 | 104 | 102 | 94 | 100 | 101 | 113 | 107 | 102 |
| Walworth | 111 | 105 | 103 | 107 | 103 | 101 | 114 | 106 | 105 |
| Banton | 103 | 100 | — | 97 | 99 | — | 105 | 101 | — |
| Granger | 118 | 108 | 104 | 116 | 103 | 100 | 119 | 111 | 107 |
| Dapps | 103 | 102 | 99 | 94 | 95 | 96 | 108 | 106 | 101 |
| Oxen | 89 | 92 | 97 | 103 | 98 | 98 | 82 | 89 | 96 |
| Express | 97 | — | — | 83 | — | — | 104 | — | — |
| Steele-ND | 112 | 108 | 105 | 97 | 97 | 100 | 120 | 114 | 109 |
| Reeder | 83 | 92 | 96 | 84 | 92 | 95 | 82 | 92 | 97 |
| Mercury | 127 | 121 | 115 | 104 | 106 | 104 | 139 | 131 | 123 |
| Parshall | 90 | 88 | 90 | 86 | 89 | 90 | 92 | 88 | 90 |
| Alsen | 95 | 95 | 94 | 94 | 97 | 96 | 95 | 93 | 93 |
| Knudson | 109 | 109 | 109 | 113 | 106 | 106 | 107 | 111 | 110 |
| Freyr | 108 | 104 | — | 115 | 101 | — | 105 | 105 | — |
| Hanna | 91 | 92 | 92 | 100 | 98 | 98 | 87 | 87 | 88 |
| Norpro | 90 | 93 | 96 | 99 | 99 | 99 | 85 | 90 | 95 |
| Granite | 102 | 102 | 102 | 105 | 105 | 101 | 101 | 101 | 103 |
| Marshall | 54 | 65 | 76 | 83 | 85 | 91 | 40 | 52 | 66 |
| Saturn | 106 | 105 | — | 103 | 102 | — | 108 | 107 | — |
| Polaris | 96 | 99 | — | 131 | 114 | — | 78 | 89 | — |
| Mean (Bu/Acre) | 51.9 | 64.2 | 67.8 | 72.8 | 78.6 | 76.3 | 42.5 | 55.1 | 62.1 |
| LSD | 17.0 | 9.3 | 6.6 | 19.0 | 12.6 | 8.2 | 20.7 | 12.5 | 9.7 |
| No. Environments | 6 | 13 | 20 | 2 | 5 | 8 | 4 | 8 | 12 |

***Grain yield (percent of the mean) of hard red spring wheat varieties grown under conventional (Con) and intensive (Int) management.[1]***

| | Grain Yield (Bu/Acre) | | | | Test Weight (Lb/Bu) | | | | Protein (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2004 | | 2005 | | 2004 | | 2005 | | 2004 | | 2005 | |
| Variety | Con[1] | Int[1] | Con | Int | Con | Int | Con | Int | Con | Int | Con | Int |
| Alsen | 88 | 90 | 53 | 56 | 61.2 | 61.9 | 59.9 | 59.2 | 14.5 | 14.6 | 15.3 | 15.3 |
| Banton | 92 | 92 | 53 | 57 | 61.4 | 61.2 | 60.6 | 59.7 | 14.3 | 14.6 | 14.6 | 14.8 |
| Briggs | 94 | 94 | 56 | 59 | 61.7 | 61.5 | 59.3 | 58.4 | 14.2 | 14.5 | 14.8 | 14.8 |
| Dapps | 91 | 86 | 50 | 51 | 60.9 | 60.0 | 57.5 | 57.1 | 14.8 | 15.5 | 16.0 | 15.5 |
| Express | — | — | 48 | 43 | — | — | 55.2 | 54.4 | — | — | 14.4 | 14.8 |
| Freyr | 87 | 92 | 58 | 58 | 60.3 | 60.7 | 58.9 | 58.6 | 14.0 | 14.5 | 14.6 | 15.2 |
| Glenn | — | — | 51 | 57 | — | — | 60.9 | 60.7 | — | — | 15.6 | 15.7 |
| Granger | 90 | 89 | 59 | 65 | 61.0 | 61.2 | 56.9 | 58.2 | 14.4 | 14.4 | 14.6 | 14.8 |
| Granite | 87 | 100 | 56 | 62 | 62.5 | 62.9 | 60.7 | 60.9 | 14.8 | 15.1 | 14.7 | 15.2 |
| Hanna | 81 | 94 | 53 | 59 | 61.5 | 61.2 | 59.5 | 59.3 | 14.2 | 14.5 | 14.6 | 15.0 |
| HJ98 | 87 | 100 | — | — | 59.3 | 60.4 | — | — | 13.4 | 13.7 | — | — |
| Ingot | 81 | 88 | — | — | 62.7 | 62.7 | — | — | 14.0 | 14.9 | — | — |
| Knudson | 93 | 96 | 61 | 64 | 60.1 | 60.3 | 59.3 | 58.8 | 13.9 | 14.0 | 14.3 | 14.4 |
| Marshall | 71 | 96 | 39 | 64 | 58.2 | 60.8 | 55.6 | 58.3 | 13.5 | 13.6 | 13.4 | 14.1 |
| Mercury | 94 | 108 | 63 | 65 | 60.5 | 60.8 | 57.2 | 56.7 | 13.5 | 13.7 | 14.2 | 14.2 |
| Norpro | 83 | 100 | 53 | 60 | 58.9 | 59.9 | 57.4 | 56.2 | 13.6 | 13.7 | 14.5 | 14.5 |
| Oklee | 88 | 94 | 55 | 58 | 61.9 | 62.5 | 59.9 | 59.5 | 14.7 | 14.8 | 15.2 | 15.0 |
| Oxen | 89 | 94 | 48 | 58 | 59.0 | 60.3 | 55.6 | 56.4 | 14.0 | 13.9 | 14.3 | 14.8 |
| P 2375 | 89 | 93 | — | — | 61.5 | 61.9 | — | — | 14.5 | 14.2 | — | — |
| Parshall | 80 | 93 | 46 | 52 | 61.5 | 62.2 | 60.1 | 59.6 | 14.3 | 14.9 | 14.1 | 15.0 |
| Polaris | 90 | 96 | 57 | 72 | 60.2 | 60.5 | 58.3 | 59.6 | 13.7 | 13.4 | 13.4 | 14.2 |
| Reeder | 88 | 98 | 43 | 52 | 60.6 | 61.5 | 56.4 | 57.4 | 14.3 | 14.6 | 13.6 | 14.2 |
| Saturn | 88 | 92 | 57 | 70 | 57.9 | 59.5 | 56.7 | 57.6 | 14.6 | 14.4 | 15.1 | 15.5 |
| Steele-ND | 88 | 87 | 52 | 52 | 61.8 | 62.0 | 59.6 | 58.7 | 14.7 | 14.6 | 14.9 | 15.1 |
| Trooper | 77 | 105 | 54 | 57 | 59.7 | 62.4 | 59.4 | 59.7 | 13.3 | 14.0 | 14.2 | 14.5 |
| Ulen | — | — | 52 | 58 | — | — | 57.9 | 57.9 | — | — | 15.3 | 15.2 |
| Verde | 90 | 93 | | | 59.6 | 60.3 | — | — | 13.9 | 13.9 | — | — |
| Walworth | 80 | 96 | 56 | 61 | 59.7 | 60.7 | 58.1 | 57.8 | 14.2 | 14.7 | 14.5 | 14.9 |
| Mean | 86.6 | 94.6 | 53.1 | 58.7 | 60.5 | 61.2 | 58.4 | 58.4 | 14.1 | 14.4 | 14.6 | 14.9 |
| LSD | 6.2 | 6.2 | 7.1 | 7.1 | 1.9 | 1.9 | 0.7 | 0.7 | 1.0 | 1.0 | 0.3 | 0.3 |

[1] Intensive trials received fungicide treatments at Feekes 5 (Stratego @ 5 fl.oz/acre), Feekes 9 (Tilt @ 4 fl.oz/acre), and Feekes10.51 (Folicur @ 4 fl.oz./acre). Conventional trials received no fungicide.

Minnesota Agricultural Experiment Station
University of Minnesota

# Hard Red Winter Wheat

J.A. Anderson, G.L. Linkert and J.J. Wiersma

Varietal Trials Results, January 2006

Winter wheat varieties are compared in trial plots at Crookston, Fosston, Lamberton, Morris, Roseau and St. Paul. The St. Paul plots suffered too much winterkill in 2005 to provide meaningful yield comparisons.

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

## *Variety Selection Criteria*

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

While all winter wheat varieties should be considered susceptible to very susceptible to FHB, they head earlier than spring wheat varieties and have a better chance of escaping FHB damage.

Most winter wheat varieties are also susceptible to very susceptible to the leaf diseases other than the rusts. Use of fungicides to control these diseases and/or suppress FHB may be warranted.

Wendy, Jagalene and Infinity CL were added to this trial for the 2005 crop year. Wendy is a white-seeded winter wheat released in 2004 by South Dakota State University. Jagalene was released by AgriPro in 2002. Infinity CL was released by the University of Nebraska in 2005 and may be used as a component of the BASF Clearfield® Production System with Beyond® herbicide.

Variety descriptions published in previous editions have been discontinued because all of the information they contained is now included in the tables.

***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 | Origin[1] | PVP Status[2] | Heading, Days From Jan. 1[3] | Height, Inches[4] | Winter-hardi-ness[5] | Lodging Rating | Test Weight, Lb./Bu. 2005 | Test Weight, Lb./Bu. 2-Year |
|---|---|---|---|---|---|---|---|---|
| Wendy | 2004 SDSU | PVP (94) | 169 | 30.7 | — | M Strg | 58.6 | — |
| Nekota | 1994 NE/SDSU | none | 171 | 32.2 | M | Med. | 58.9 | 58.1 |
| Expedition | 2002 SDSU | PVP (94) | 172 | 33.4 | M | Med. | 59.3 | 58.4 |
| Arapahoe | 1988 NE | PVP (94) | 173 | 34.3 | M | M Strg | 60.1 | 58.4 |
| Infinity CL | 2005 NE | PVP (pending) | 173 | 35.3 | — | — | 60.5 | — |
| Jagalene | 2002 AgriPro | PVP (94) | 173 | 31.2 | — | — | 54.1 | — |
| Millenium | 1999 NE | PVP (94) | 174 | 37.1 | M | Strong | 60.3 | 59.8 |
| Seward | 1987 NDSU | none | 175 | 37.5 | MH | Med. | 60.1 | 59.6 |
| CDC Buteo | 2001 CAN | none | 176 | 36.1 | MH | Strong | 60.6 | 60.5 |
| Ransom | 1998 NDSU | PVP (94) | 176 | 37.5 | MH | Med. | 58.8 | 58.8 |
| CDC Falcon | 1998 CAN | PVP (94) | 176 | 32.4 | MH | Strong | 57.0 | 58.0 |
| Roughrider | 1975 NDSU | none | 176 | 38.5 | VH | Med. | 59.4 | 59.1 |
| Jerry | 2001 NDSU | none | 177 | 39.1 | MH | M Strg | 59.4 | 58.9 |
| CDC Raptor | 1999 CAN | none | 177 | 33.2 | MH | Strong | 56.2 | 55.8 |
| Mean | | | 174 | 34.9 | | | 58.8 | 58.7 |

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

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

[3] 2004 and 2005 data.

[4] 2005 data.

[5] Winterhardiness rating is a relative ranking that includes data from MN, ND, NE and SD: VH = very high, H = high, MH = moderately high, M = moderate.

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

***Growth characteristics of winter wheat varieties (continued).***

| Variety | Protein % At 12% Moisture 2005 | Protein % At 12% Moisture 2-Year | Rust Resistance[6] Leaf | Rust Resistance[6] Stem |
|---|---|---|---|---|
| Wendy | 12.8 | — | — | — |
| Nekota | 12.1 | 12.4 | S | — |
| Expedition | 12.2 | 12.6 | S | R |
| Arapahoe | 12.8 | 13.1 | MR | MR |
| Infinity CL | 12.3 | — | MR | — |
| Jagalene | 13.0 | — | S | MR |
| Millenium | 12.9 | 13.0 | MR | R |
| Seward | 12.0 | 12.0 | S | MR |
| CDC Buteo | 12.1 | 12.3 | MS | — |
| Ransom | 12.8 | 12.8 | MR | MR |
| CDC Falcon | 12.7 | 12.6 | MS | R |
| Roughrider | 13.2 | 13.2 | S | R |
| Jerry | 13.1 | 13.1 | MR | R |
| CDC Raptor | 12.3 | 12.3 | MS | — |
| Mean | 12.6 | 12.7 | | |

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

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

| | Crookston | | Fosston | Lamberton | | | Morris | | |
|---|---|---|---|---|---|---|---|---|---|
| Variety | 2005 | 2-Year | 2005 | 2005 | 2-Year | 3-Year | 2005 | 2-Year | 3-Year |
| Wendy | 105 | — | 95 | 43 | — | — | 107 | — | — |
| Nekota | 109 | 97 | 100 | 77 | 61 | — | 79 | —[1] | — |
| Expedition | 91 | 94 | 110 | 59 | 54 | — | 73 | —[1] | — |
| Arapahoe | 134 | 125 | 123 | 156 | 115 | 113 | 112 | 101 | 104 |
| Infinity CL | 131 | — | 114 | 160 | — | — | 124 | — | — |
| Jagalene | 88 | — | 87 | 58 | — | — | 62 | — | — |
| Millenium | 123 | 114 | 121 | 145 | 127 | 122 | 146 | 125 | 122 |
| Seward | 104 | 106 | 94 | 99 | 107 | 107 | 112 | 101 | 89 |
| CDC Buteo | 94 | 104 | 98 | 76 | 96 | — | 80 | 95 | — |
| Ransom | 105 | 102 | 101 | 134 | 128 | 122 | 119 | 117 | 104 |
| CDC Falcon | 111 | 107 | 108 | 118 | 120 | — | 108 | 95 | — |
| Roughrider | 85 | 86 | 86 | 79 | 89 | 85 | 90 | 100 | 87 |
| Jerry | 126 | 121 | 108 | 161 | 139 | 134 | 136 | 112 | 110 |
| CDC Raptor | 92 | 94 | 84 | 80 | 92 | — | 86 | 92 | — |
| Mean (Bu/A) | 60.3 | 91.8 | 69.3 | 27.9 | 40.8 | 46.4 | 34.2 | 42.8 | 46.7 |
| LSD | 18.0 | 16.6 | 12.0 | 22.0 | 48.7 | 31 | 22.0 | 41.1 | 35.2 |

[1] Nekota and Expedition headed 5 to 7 days earlier than other varieties at Morris in 2004 and suffered severe damage from leaf rust and broken straw. Because yield was less than 15% of the mean, these data are not included here.

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

| | Roseau | | State | | |
|---|---|---|---|---|---|
| Variety | 2005 | 2-Year | 2005 | 2-Year | 3-Year |
| Wendy | 102 | — | 91 | — | — |
| Nekota | 115 | 100 | 96 | —[1] | — |
| Expedition | 108 | 95 | 88 | —[1] | — |
| Arapahoe | 112 | 97 | 127 | 109 | 109 |
| Infinity CL | 113 | — | 129 | — | — |
| Jagalene | 84 | — | 76 | — | — |
| Millenium | 113 | 113 | 130 | 119 | 117 |
| Seward | 99 | 109 | 102 | 105 | 100 |
| CDC Buteo | 96 | 105 | 89 | 101 | — |
| Ransom | 97 | 103 | 111 | 111 | 106 |
| CDC Falcon | 114 | 118 | 112 | 110 | — |
| Roughrider | 79 | 85 | 83 | 90 | 84 |
| Jerry | 107 | 109 | 128 | 118 | 116 |
| CDC Raptor | 75 | 86 | 83 | 91 | — |
| Mean (Bu/A) | 57.8 | 75.9 | 49.9 | 64.3 | 65.5 |
| LSD | 13.2 | 35.6 | 12.9 | 12.8 | 14.5 |

[1] Nekota and Expedition headed 5 to 7 days earlier than other varieties at Morris in 2004 and suffered severe damage from leaf rust and broken straw. Because yield was less than 15% of the mean, these data are not included here.

Minnesota Agricultural Experiment Station
University of Minnesota

# Wildrice

R.A. Porter

## Varietal Trials Results, January 2006

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

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

### *Varieties*

**Franklin**–Medium height, medium to early maturity. More resistant to shattering than older varieties, such as K2, especially retaining more seed when harvest is delayed. Long seeds, resulting in higher percentage of long-grain seeds in A-grade width. Released 1992 by Minn. AES.

**GIB-C9**–High yielding, tall, medium-late maturing variety. Average shattering resistance. Seed is short, similar in length to Itasca and Petrowske Bottlebrush. Panicle type is mixed, including a noticeable percentage of bottlebrush panicles, depending on continuing selection intensity for the trait. Proprietary variety owned by Gunvalson Brothers and Pine Lake Wild Rice.

**Itasca**–High yielding, tall, medium-late maturing variety with superior resistance to seed shattering and fungal brown spot (FBS) disease. Very lodging resistant. Yield is about 50% higher than Petrowske Purple and Franklin. Shattering loss is about 1/3 less than Franklin or Petrowske Purple. Significantly more FBS resistant than Franklin. Taller than Franklin by 3 inches and Petrowske Purple by 4 inches. Slightly later maturing than Petrowske Purple. Flowers 2-3 days after Petrowske Purple or Franklin. Average seed length is somewhat short–similar to Petrowske Purple and GIB-C9 but shorter than Franklin by 1/64 inch. Panicle type is mixed, including a noticeable percentage of bottlebrush panicles, but declining from 50% frequency without continued selection for the trait. Released 2002 exclusively to Minnesota growers by the Minnesota Cultivated Wild Rice Council.

**Petrowske Purple**–Moderately high fungal brown spot disease resistance and yield. High shattering resistance and lodging resistance. Consists of heterogeneous panicle types, most of which have some degree of purple at full flowering. Medium plant height. Medium-late maturity, flowering several days to a week after K2 and Franklin. Seeds shorter in length than most older varieties, but similar in length to Itasca and GIB-C9. Released 2000 by Minn. AES under a licensing agreement.

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

| | Kelliher/Waskish | | | | Clearbrook/Gully | | |
|---|---|---|---|---|---|---|---|
| Variety | Yield, Lb/Acre[1] | Shattering, %[2] | Lodging Score[3] | FBS Score[4] | Yield, Lb/Acre[1] | Lodging Score[3] | FBS Score[4] |
| Franklin | 1,255 | 23 | 2.7 | 4.8 | 1,439 | 2.4 | 4.0 |
| GIB-C9 | 1,703 | 25 | 2.1 | 4.1 | 2,064 | 2.8 | 4.6 |
| Itasca | 1,793 | 17 | 1.3 | 3.2 | 2,429 | 2.0 | 3.5 |
| Petrowske Purple | 1,378 | 22 | 1.7 | 3.7 | 1,458 | 1.9 | 4.0 |
| LSD (0.05) | 197 | 4 | 0.4 | 0.6 | 374 | 0.6 | 0.8 |
| Years | 98-99-00-01-02 | 98-99-01 | 98-99-01-02 | 98-99-00-01-02 | 00-03 | 98-03 | 98-00-03 |

[1] Adjusted to 40% moisture.
[2] Expressed as a percentage of shattered seed plus grain yield per unit area.
[3] Using a 1-5 scale where 1 = stems completely erect, 3 = stems averaging 45° angle, 5 = stems prostrate.
[4] Fungal Brown Spot rating using a 1-9 scale where 1 = no significant disease lesions and 9 = completely susceptible (dead).

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

| | Aitkin | | | | 1998-2005 Average | | | |
|---|---|---|---|---|---|---|---|---|
| Variety | Yield, Lb/Acre[1] | Shatter-ing, %[2] | Lodging Score[3] | FBS Score[4] | Yield, Lb/Acre[1] | Shatter-ing, %[2] | Lodging Score[3] | FBS Score[4] |
| Franklin | 1,298 | 27 | 2.1 | 4.5 | 1,244 | 22 | 2.4 | 4.6 |
| GIB-C9 | 1,407 | 45 | 1.8 | 4.2 | 1,629 | 28 | 2.2 | 4.3 |
| Itasca | 1,946 | 16 | 1.1 | 3.8 | 1,915 | 16 | 1.3 | 3.6 |
| Petrowske Purple | — | — | — | — | — | — | — | — |
| LSD (0.05) | 230 | 4 | 0.3 | 0.6 | 139 | 3 | 0.2 | 0.4 |

[1] Adjusted to 40% moisture.
[2] Expressed as a percentage of shattered seed plus grain yield per unit area.
[3] Using a 1-5 scale where 1 = stems completely erect, 3 = stems averaging 45° angle, 5 = stems prostrate.
[4] Fungal Brown Spot rating using a 1-9 scale where 1 = no significant disease lesions and 9 = completely susceptible (dead).

***Seed length and width, and percent long in A-grade.***

| | Kelliher/Waskish | | | Clearbrook/Gully | | | Aitkin | | |
|---|---|---|---|---|---|---|---|---|---|
| Variety | Seed Length 64th in.[1] | Seed Width, 64th in.[1] | Long-In A-Grade, %[2] | Seed Length 64th in.[1] | Seed Width, 64th in.[1] | Long-In A-Grade, %[2] | Seed Length 64th in.[1] | Seed Width, 64th in.[1] | Long-In A-Grade, %[2] |
| Franklin | 22.9 | 4.09 | 95 | 23.4 | 4.32 | 94 | 23.7 | 4.25 | 95 |
| GIB-C9 | 21.9 | 4.19 | 84 | 23.0 | 4.45 | 89 | 22.9 | 4.22 | 90 |
| Itasca | 21.7 | 4.13 | 82 | 22.8 | 4.40 | 91 | 22.4 | 4.26 | 88 |
| Petrowske Purple | 21.9 | 4.00 | 86 | 23.1 | 4.19 | 92 | — | — | — |
| LSD (0.05) | 0.4 | 0.08 | 5 | 0.6 | 0.11 | 5 | 0.6 | 0.09 | 3 |
| Years | 00-01-02 | 00-01-02 | 00-01-02 | 00-03 | 00-03 | 00-03 | 00-01-02-05 | 00-01-02-05 | 00-01-02-05 |

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

***Seed length and width, and percent long in A-grade (continued).***

| | 2000-2005 Average | | |
|---|---|---|---|
| Variety | Seed Length 64th in.[1] | Seed Width, 64th in.[1] | Long-In A-Grade, %[2] |
| Franklin | 23.4 | 4.21 | 95 |
| GIB-C9 | 22.6 | 4.26 | 88 |
| Itasca | 22.3 | 4.25 | 87 |
| Petrowske Purple | — | — | — |
| LSD (0.05) | 0.3 | 0.05 | 2 |

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

***Wildrice Planting Rate and Date***

Bushel Weight, Pounds..... 25
Seeds/Pound..... 7,900
Planting Rate, Pounds/Acre..... 50
Planting Rate, Seeds Sq.Ft..... 9
Planting Date..... Late Fall

Minnesota Agricultural Experiment Station
University of Minnesota

# Canola

P.M. Porter and D.G. LeGare

## Varietal Trials Results, January 2006

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

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

The canola (*Brassica napus*) varieties described here are both spring types and fall-planted winter types. Fall-planted winter-type canola varieties were evaluated by University of Minnesota researchers more than 15 years ago with limited success. A trial with winter-type canola varieties seeded at multiple seeding dates in fall 2002 near St. Hilaire yielded up to 2,400 pounds/acre. This trial was repeated in 2003-04 at Thief River Falls, Morris and Waseca with limited survivability at all three locations.

A national winter canola variety trial was also seeded in fall 2003 at two locations in Minnesota. A total of 38 winter canola varieties were tested, 8 of them Roundup Ready. While the very hard winter caused extensive mortality in both trials, some varieties were still able to yield close to 3,000 pounds/acre where stand was adequate.

The 2004-05 national winter canola variety trial was again seeded in fall 2004 on barley stubble and on plowed ground near Thief River Falls. Plots seeded into barley stubble survived the winter very well, but the plots on plowed ground all died. Data presented here are the results from that trial.

The 2005-06 national winter canola variety trial, seeded in fall 2005 west of St. Hilaire on wheat stubble, was very healthy going into the winter.

### Information Sources

The Minnesota Canola Council is a good source for information on canola. The Council can be contacted by mail (4630 Churchill St., Suite 1, St. Paul, MN 55126), phone (651-638-9883) or fax (651-638-0756).

A complete and revised "Canola Growers Manual" on canola production is available from the Canola Council of Canada, 400-167 Lombard Ave, Winnipeg, Manitoba, Canada, R3B 0T6 (phone 204-982-2100, internet www.canola-council.org). The manual contains detailed information on canola production practices and costs $59.95 (U.S.). Another management tool is a CD-ROM called the "Canola Growers Decision Support System" available from the Canola Council of Canada for $28.00 (U.S.). For a limited time the revised "Canola Growers Manual" together with the "Canola Growers Decision Support System" are being offered for $69.95. The "Canola Growers Manual" is also available for viewing online at www.canola-council.org. Any of these items can be ordered on line.

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.

### Test Sites

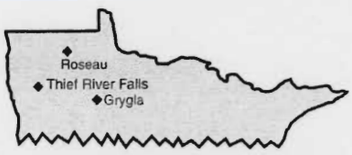
Non-Roundup Ready and Roundup Ready variety trials were seeded at two sites in 2005. The Roseau site was on the Steve Dahl Farm and the Grygla site was on the Todd Stanley farm. The Roseau non-Roundup Ready trial is not reported because excessive drowned-out areas caused unreliable data. The 2205-2005 winter canola trial was on the Lyle Olson farm.

### Local Support

Farmer's Union Oil of Grygla provided support for the Grygla site.

### Field Day Assistance

Extension educators Nathan L. Johnson, Hans J. Kandel and Bill Craig provided field day assistance.




Locations of 2005 canola trials.

***Canola Variety Name Changes***

| Old Name or Experimental Number | New Variety Name |
|---|---|
| PHS02-555 | InVigor 5550 |
| PR9040 | IS 3465 RR |
| SW G5269 RR | DKL 52-10 |
| Z2409 | IS 7145 RR |

***Seed sources for 2005 planting, keyed to "Variety Information" column in seed yield tables that follow.***

*Developers*

D1 Advanta Seeds, Unit 3, 75 Scurfield Blvd., Winnipeg, MB, Canada R3Y-1P6
D2 Agriprogress, P.O. Box 2499, Morden, MB, Canada R6M 1C2
D3 Bayer Crop Science, 203-407 Downey Rd., Saskatoon, SK, Canada S7N 4L8; 701-775-2700
D4 Dow AgroSciences, 101-421 Downey Rd., Saskatoon, SK, Canada S7N 4L8
D5 Monsanto Canada Seeds, 2915 A Faithful Ave., Saskatoon, SK, Canada S7K 8E8; 306-657-4675
D6 Pioneer Hi-Bred International, Inc., 7200 N.W. 62nd Ave., Johnston, IA 50131
D7 Svalof Weibull Ltd., 2-411 Downey Road, Saskatoon, SK, Canada S7N 4L8
D8 Not Available

*Marketers*

M1 Bayer Crop Science, 203-407 Downey Rd., Saskatoon, SK, Canada S7N 4L8; 701-775-2700
M2 Croplan Genetics, P.O. Box 1291, Minot, ND 59702; 701-852-3556
M3 Dekalb, 304 Center St., West Fargo, ND 58078; 800-437-4120
M4 Dow AgroSciences, R.R. 1 Box 80, Buchanan, ND 58421; 701-252-6643
M5 Interstate Seed Company, 304 Center St., West Fargo, ND 58078; 800-437-4120
M6 Monsanto, 304 Center St., West Fargo, ND 58078; 800-437-4120
M7 Pioneer Hi-Bred International, Inc., 99 Navaho Ave. Suite 101A, Mankato, MN 56001; 507-625-3045
M8 Proseed, 705 E. Brewster, Harvey, ND 58341; 701-324-4177

***Seed yield of Roundup Ready canola (Brassica napus) varieties (lb/acre at 8% moisture) at Roseau and Grygla in 2005.***

***Variety information*** includes Source Codes: (D# = Developer; M# = Marketer) keyed to listing above, and these supplemental codes: H = Hybrid, Op = Open Pollinated, Sync = Synthetic.
***Blackleg Resistance Rating*** provided by seed companies: CR = Canker Resistant, R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible.

| Variety | Variety Information | Blackleg Rating | Roseau ** | Grygla | 2005 Average, Ros & Gry | 2004 Average, R,K *** | 2003 Average, R, K, G | 3-Year Average |
|---|---|---|---|---|---|---|---|---|
| 04S31 | D8,M2,Syn | MR | 1,318 | 1,815 | 1,567 | — | — | — |
| AV9525 RR | D8,M6,H | R | 1,170 | 1,448 | 1,309 | — | — | — |
| Crosby | D8,M2,Op | R | 1,450 | 1,602 | 1,526 | 1,605 | 2,379 | 1,914 |
| DKL35-85 | D5,M3,Op | R | 1,260 | 1,775 | 1,517 | 1,777 | — | — |
| DKL38-25 | D5,M3,H | MR | 1,625 | 1,864 | 1,744 | — | — | — |
| DKL52-10 | D7,M3,Op | R | 1,364 | 1,549 | 1,457 | — | — | — |
| HyCLASS 712 | D8,M2,Syn | MR | 1,379 | 1,928 | 1,654 | — | — | — |
| HyCLASS 767 | D7,M2,Syn | MR | 1,162 | 1,890 | 1,526 | 1,695 | 2,368 | 1,935 |

***Seed yield of Roundup Ready canola (Brassica napus) varieties at Roseau and Grygla in 2005 (continued).***

| Variety | Variety Information | Blackleg Rating | Roseau ** | Grygla | 2005 Average, Ros & Gry | 2004 Average, R,K *** | 2003 Average, R, K, G | 3-Year Average |
|---|---|---|---|---|---|---|---|---|
| HyCLASS 905 | D8,M2,H | R | 1,441 | 1,807 | 1,624 | 1,881 | 2,448 | 2,051 |
| HyCLASS 910 | D8,M2,H | R | 1,197 | 1,729 | 1,463 | 1,857 | 2,611 | 2,068 |
| HyLite 225 RR | D1,M5,Op | MR | 1,267 | 1,605 | 1,436 | 1,824 | — | — |
| Hyola 357 Magnum* | D1,M5,H | MR | 1,551 | 1,929 | 1,740 | 2,040 | 2,398 | 2,108 |
| Hyola 514 RR | D8,M5,H | R | 1,736 | 1,629 | 1,682 | — | — | — |
| IS 3465 RR | D8,M5,Op | R | 1,398 | 1,526 | 1,462 | — | — | — |
| IS 7145 RR | D1,M5,H | MR | 1,489 | 1,902 | 1,696 | 1,946 | — | — |
| Pioneer 45H21 | D6,M7,H | R | 1,613 | 1,903 | 1,758 | 2,099 | 2,559 | 2,199 |
| Pioneer 45H25 | D6,M7,H | R | 1,693 | 1,794 | 1,743 | — | — | — |
| Roughrider Plus | D2,M8,H | MR | 1,399 | 1,457 | 1,428 | — | — | — |
| RR 2066 | D2,M8,H | MR | 1,196 | 1,530 | 1,363 | 2,032 | 2,243 | 1,931 |
| SW H5263 RR | D7,M6,H | R | 1,050 | 1,679 | 1,365 | — | — | — |
| SW H5272 RR | D7,M6,H | R | 1,593 | 1,626 | 1,610 | — | — | — |
| SW Marksman RR | D7,M5,H | MR | 1,331 | 1,921 | 1,626 | 1,861 | 2,506 | 2,070 |
| SW Patriot RR | D7,M5,Syn | MR | 1,460 | 1,575 | 1,517 | 1,884 | 2,484 | 2,036 |
| SW Titan RR | D7,M5,H | R | 1,381 | 1,582 | 1,481 | 1,801 | — | — |
| Mean | | | 1,397 | 1,711 | 1,554 | 1,822 | 2,303 | 1,952 |
| LSD (0.05) | | | 405.8 ** | 285.5 | 246 | 137.02 | 187.1 | — |
| C.V. | | | 20.6 | 11.8 | 16.0 | 7.6 | 10.1 | — |

* Hyola 357 Magnum was used as a check between the non-Roundup Ready trial and the Roundup Ready trial.

** 2005 Roseau yields were not significantly different.

*** K = Kennedy.

***Growth characteristics and oil content of Roundup Ready spring canola varieties grown near Roseau, seeded May 16, 2005.***

Differences among treatments for yield and height were not significant.

| Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Wt. at 0% Moisture | Days After Planting To: Begin Bloom | Bloom Duration | Maturity: 30% Seed Color Change On Main Raceme | Height, Inches | Lodging, 1 = Erect 9 = Flat |
|---|---|---|---|---|---|---|---|
| 04S31 | 1,318 | 41.5 | 46 | 24 | 87 | 29 | 3.5 |
| AV9525 RR | 1,170 | 42.6 | 46 | 20 | 85 | 26 | 4.5 |
| Crosby | 1,450 | 43.5 | 48 | 21 | 94 | 27 | 3.5 |
| DKL35-85 | 1,260 | 40.4 | 48 | 25 | 92 | 26 | 3.0 |
| DKL38-25 | 1,625 | 42.0 | 46 | 20 | 85 | 29 | 2.8 |
| DKL52-10 | 1,364 | 41.6 | 46 | 22 | 89 | 29 | 3.0 |
| HyClass 712 | 1,379 | 43.6 | 46 | 20 | 88 | 28 | 3.8 |
| HyClass 767 | 1,162 | 41.4 | 45 | 20 | 85 | 25 | 4.0 |
| HyClass 905 | 1,441 | 42.9 | 46 | 20 | 85 | 31 | 3.3 |
| HyClass 910 | 1,197 | 42.9 | 46 | 19 | 85 | 27 | 3.8 |
| HyLite 225 RR | 1,267 | 42.8 | 45 | 21 | 86 | 26 | 4.0 |
| Hyola Magnum | 1,551 | 40.8 | 43 | 22 | 89 | 27 | 4.5 |
| Hyola 514 RR | 1,736 | 45.1 | 48 | 24 | 91 | 30 | 4.5 |
| IS 3465 RR | 1,398 | 40.6 | 45 | 26 | 91 | 28 | 3.8 |
| IS 7145 RR | 1,489 | 47.1 | 46 | 19 | 84 | 27 | 4.5 |
| Pioneer 45H21 | 1,613 | 42.8 | 46 | 20 | 89 | 30 | 4.8 |
| Pioneer 45H25 | 1,693 | 43.3 | 45 | 22 | 88 | 32 | 4.5 |
| Roughrider Plus | 1,399 | 41.8 | 47 | 22 | 90 | 30 | 4.0 |
| RR 2066 | 1,196 | 42.0 | 45 | 21 | 85 | 25 | 3.8 |
| SW H5263 RR | 1,050 | 44.3 | 48 | 24 | 91 | 23 | 3.8 |

***Growth characteristics and oil content of Roundup Ready spring canola varieties grown near Roseau, seeded May 16, 2005 (continued).***

| Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Wt. at 0% Moisture | Days After Planting To: Begin Bloom | Bloom Duration | Maturity: 30% Seed Color Change On Main Raceme | Height, Inches | Lodging, 1 = Erect 9 = Flat |
|---|---|---|---|---|---|---|---|
| SW H5272 RR | 1,593 | 42.1 | 46 | 23 | 86 | 30 | 3.8 |
| SW Marksman RR | 1,331 | 42.9 | 45 | 21 | 85 | 26 | 5.0 |
| SW Patriot RR | 1,460 | 43.0 | 45 | 21 | 84 | 27 | 4.3 |
| SW Titan RR | 1,381 | 41.9 | 45 | 21 | 86 | 30 | 3.8 |
| Mean | 1,397 | 42.6 | 46 | 22 | 87 | 28 | 3.9 |
| LSD (0.05) | 405.8 | 1.40 | 0.9 | 3.0 | 0.3 | 5.2 | 0.97 |
| Pr > F | 0.0851 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.1263 | 0.0005 |
| C.V. | 20.6 | 2.0 | 1.4 | 9.9 | 2.6 | 13.2 | 17.7 |

***Growth characteristics and oil content of Roundup Ready spring canola varieties grown near Grygla, seeded April 29, 2005.***

Total available fertilizer was 140-276-350-490 (N-P-K-S) down to 24 inches.

| Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Wt. at 0% Moisture | Days After Planting To: Begin Bloom | Bloom Duration | Maturity: 30% Seed Color Change On Main Raceme | Height, Inches | Lodging, 1 = Erect 9 = Flat |
|---|---|---|---|---|---|---|---|
| 04S31 | 1,815 | 41.8 | 52 | 24 | 95 | 35 | 3.5 |
| AV9525 RR | 1,448 | 44.7 | 52 | 24 | 94 | 37 | 3.5 |
| Crosby | 1,602 | 43.0 | 53 | 26 | 101 | 31 | 4.5 |
| DKL35-85 | 1,775 | 39.4 | 53 | 24 | 97 | 37 | 3.5 |
| DKL38-25 | 1,864 | 42.3 | 51 | 23 | 93 | 36 | 3.5 |
| DKL52-10 | 1,549 | 41.7 | 52 | 23 | 93 | 35 | 4.3 |
| HyClass 712 | 1,928 | 43.2 | 52 | 21 | 94 | 38 | 2.5 |
| HyClass 767 | 1,890 | 41.9 | 51 | 24 | 93 | 37 | 3.5 |
| HyClass 905 | 1,807 | 43.1 | 52 | 22 | 94 | 37 | 2.8 |
| HyClass 910 | 1,729 | 42.6 | 52 | 23 | 95 | 35 | 4.5 |
| HyLite 225 RR | 1,605 | 42.5 | 51 | 23 | 96 | 33 | 4.8 |
| Hyola 357 Mag | 1,929 | 41.0 | 50 | 23 | 95 | 33 | 3.0 |
| Hyola 514 RR | 1,629 | 46.3 | 53 | 23 | 94 | 39 | 3.8 |
| IS 3465 RR | 1,526 | 40.9 | 52 | 24 | 95 | 33 | 4.0 |
| IS 7145 RR | 1,902 | 45.1 | 51 | 23 | 92 | 34 | 3.0 |
| Pioneer 45H21 | 1,903 | 43.0 | 51 | 23 | 95 | 37 | 3.5 |
| Pioneer 45H25 | 1,794 | 44.6 | 51 | 24 | 94 | 45 | 2.8 |
| Roughrider Plus | 1,457 | 43.7 | 52 | 25 | 97 | 35 | 4.8 |
| RR 2066 | 1,530 | 41.6 | 51 | 24 | 95 | 33 | 4.8 |
| SW H5263 RR | 1,679 | 46.0 | 52 | 24 | 95 | 32 | 3.8 |
| SW H5272 RR | 1,626 | 43.7 | 53 | 23 | 93 | 36 | 3.5 |
| SW Marksman RR | 1,921 | 42.9 | 51 | 23 | 94 | 36 | 2.8 |
| SW Patriot RR | 1,575 | 41.9 | 51 | 23 | 94 | 35 | 4.3 |
| SW Titan RR | 1,582 | 41.2 | 51 | 23 | 94 | 36 | 4.0 |
| Mean | 1,711 | 42.8 | 52 | 23 | 95 | 36 | 3.7 |
| LSD (0.05) | 285.5 | 1.48 | 0.8 | 1.3 | 1.7 | 4.4 | 1.11 |
| Pr > F | 0.0015 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | 0.0002 |
| C.V. | 11.8 | 2.1 | 1.1 | 4.0 | 1.2 | 8.9 | 21.4 |

***Seed yield and growth characteristics of Non-Roundup Ready spring canola (Brassica napus) varieties at Grygla, seeded April 30, 2005.***

Total available fertilizer was 140-276-350-490 (N-P-K-S) down to 24 inches.

***Variety information*** includes Source Codes: (D# = Developer: M# = Marketer) keyed to listing above, and these supplemental codes: H = Hybrid, RR = Roundup Ready, Op = Open Pollinated, Syn = Synthetic, SP = Specialty Oil Type, LL = Liberty Link, C = Clearfield (Raptor tolerant).

***Blackleg Resistance Rating*** provided by seed companies: CR = Canker Resistant, R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible.

| | | | | | Days After Planting To | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Variety | Variety Information | Blackleg Rating | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Wt. at 0% Moist ** | Begin Bloom ** | Maturity: 30% Seed Color Change On Main Raceme | Height, Inches | Lodging, 1 = Erect 9 = Flat | 2004 Average, Ros & Gry, Yield, Lb/Acre |
| HyLite 618 CL | D1,M5,H,C | R | 1,822 | 40.7 | 50 | 92 | 36 | 3.0 | 2,332 |
| Hyola 357 Magnum* | D1,M5,H,RR | MR | 1,978 | 41.4 | 50 | 95 | 34 | 2.5 | 2,374 |
| InVigor 2663 | D3,M1,H ,LL | R | 2,129 | 39.9 | 52 | 93 | 39 | 3.3 | 2,574 |
| InVigor 4870 | D3,M1,H ,LL | R | 2,178 | 41.8 | 51 | 93 | 42 | 2.5 | 2,533 |
| InVigor 5630 | D3,M1,H ,LL | R | 2,057 | 42.6 | 51 | 93 | 37 | 3.0 | 2,657 |
| Nexera 824 CL | D4,M4,OP,SP,C | R | 1,287 | 41.5 | 55 | 108 | 33 | 5.8 | — |
| Nexera 830 CL | D4,M4,OP,SP,C | R | 1,604 | 41.5 | 49 | 104 | 35 | 5.5 | — |
| Pioneer 45H72 | D6,M6,H,C | R | 1,806 | 41.0 | 51 | 95 | 39 | 3.3 | — |
| US040501 | D4,M4,OP,SP,C | R | 1,262 | 39.7 | 55 | 98 | 33 | 4.8 | — |
| US040503 | D4,M4,OP,SP,C | R | 1,605 | 41.2 | 54 | 96 | 40 | 2.3 | — |
| US050505 | D4,M4,OP,SP | R | 1,742 | 41.6 | 52 | 95 | 39 | 3.0 | — |
| Mean | | | 1,763 | 41.2 | 52 | 96 | 36 | 3.5 | 2,411 |
| LSD (0.05) | | | 250.1 | 3.13 ** | 5.0 ** | 1.5 | 3.4 | 1.06 | 244.5 |
| Pr > F | | | 0.0001 | 0.8397 | 0.3274 | 0.0001 | 0.0001 | 0.0001 | 0.0001 |
| C.V. | | | 9.9 | 4.5 | 6.7 | 1.1 | 6.5 | 20.9 | 8.7 |

* Hyola 357 Magnum was used as a check between the Non-Roundup Ready trial and the Roundup Ready trial.

** Differences among treatments for oil content and begin bloom were not significant.

***Growth characteristics and oil content of the variety and systems comparison trial grown near Grygla, seeded April 29, 2005.***

Total available fertilizer was 138-268-350-490 (N-P-K-S) down to 24 inches.

Large plots (400 feet x 30 feet) replicated 4 times.

All varieties in this trial are spring canola. Commercial equipment used for planting and harvesting.

Each system was sprayed with the respective herbicides and the trial was threshed on August 22, 2005.

| | | | Days After Planting To | | | | |
|---|---|---|---|---|---|---|---|
| Variety | Yield, Lb/Acre at 9% Moisture | Oil, % of Seed Wt. at 0% Moisture | Begin Bloom | Maturity: 30% Seed Color Change On Main Raceme | Height, Inches | Lodging, * 1 = Erect 9 = Flat | Swath Score, * 1 = easy 5 = difficult |
| ***Conventional system*** | | | | | | | |
| Hyola 401 | 1,348 | 42.7 | 51 | 93 | 28 | 3.0 | 3.0 |
| ***Liberty Link System*** | | | | | | | |
| InVigor 5630 | 1,423 | 44.1 | 50 | 93 | 33 | 3.5 | 2.5 |
| InVigor 4870 | 1,410 | 43.4 | 53 | 94 | 36 | 3.5 | 2.5 |
| ***Clearfield System*** | | | | | | | |
| Pioneer 45H72 | 1,343 | 43.1 | 52 | 93 | 36 | 4.0 | 2.8 |

***Growth characteristics and oil content of the variety and systems comparison trial grown near Grygla, seeded April 29, 2005 (continued).***

| Variety | Yield, Lb/Acre at 9% Moisture | Oil, % of Seed Wt. at 0% Moisture | Days After Planting To: Begin Bloom | Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme | Height, Inches | Lodging, * 1 = Erect 9 = Flat | Swath Score, * 1 = easy 5 = difficult |
|---|---|---|---|---|---|---|---|
| ***Roundup Ready System*** | | | | | | | |
| Hyola 357 Magnum | 1,478 | 42.3 | 50 | 94 | 29 | 3.0 | 2.3 |
| DKL38-25 | 1,455 | 44.0 | 52 | 93 | 32 | 3.3 | 2.5 |
| Pioneer 45H21 | 1,376 | 42.9 | 52 | 94 | 33 | 3.8 | 2.8 |
| IS 7145 RR | 1,338 | 44.4 | 51 | 91 | 31 | 3.8 | 2.8 |
| SW Titan RR | 1,255 | 42.9 | 52 | 93 | 33 | 3.3 | 2.0 |
| Roughrider Plus | 1,193 | 43.4 | 54 | 96 | 32 | 3.8 | 2.8 |
| Mean | 1,362 | 43.3 | 51 | 93 | 32 | 3.5 | 2.6 |
| LSD (0.05) | 100.5 | 0.93 | 0.8 | 1.1 | 2.7 | 0.77 * | 0.67 * |
| Pr > F | 0.0003 | 0.0011 | 0.0001 | 0.0001 | 0.0001 | 0.1506 | 0.1657 |
| C.V. | 5.6 | 1.5 | 1.0 | 0.8 | 5.7 | 15.3 | 17.8 |

* Differences among treatments for lodging and swath score were not significant.

***Yield, oil content and growth characteristics of winter canola varieties grown near Thief River Falls, seeded September 2, 2004.***

Total available fertilizer was 174-60-332-86 (N-P-K-S) down to 24 inches. Plots were seeded Sept. 2, 2004, into barley stubble and harvested in July 2005.

Two plots of a winter/spring canola cross planted next to the winter canola variety trial and seeded over the soil on April 1, 2005, matured on August 3 and yielded an average 1,645 lb/acre.

| Winter Canola Variety | Yield, Lb/Acre at 8% Moisture | Oil, % of Seed Wt. at 0% Moisture | Days After April 1* To: Begin Bloom | Days After April 1* To: Bloom Duration | Days After April 1* To: Maturity: 30% Seed Color Change On Main Raceme | Fall Vigor, 0 = None 9 = Good | Winter Survival, 0 = None 9 = Good | Spring Stand, Plants/ Sq Ft | Height, Inches | Lodging, 1 = Erect, 9 = Flat |
|---|---|---|---|---|---|---|---|---|---|---|
| ARC92004 | 820 | 37.2 | 59 | 33 | 111 | 7.7 | 7.0 | 3.8 | 45 | 3.7 |
| Casino | 1051 | 37.9 | 60 | 31 | 113 | 5.0 | 6.3 | 2.4 | 44 | 3.3 |
| KS2004 | 778 | 38.2 | 62 | 28 | 113 | 4.7 | 3.3 | 1.7 | 38 | 5.0 |
| KS2064 | 1,006 | 39.1 | 60 | 30 | 111 | 5.0 | 7.3 | 4.1 | 41 | 3.7 |
| KS2098 | 1,016 | 38.8 | 59 | 31 | 112 | 5.7 | 7.0 | 2.9 | 42 | 3.7 |
| KS2169 | 1,272 | 39.6 | 58 | 32 | 111 | 6.0 | 7.0 | 5.3 | 37 | 3.3 |
| KS2185 | 1,244 | 39.0 | 56 | 33 | 112 | 5.7 | 7.0 | 3.2 | 37 | 3.7 |
| KS3018 | 717 | 36.2 | 57 | 32 | 108 | 5.7 | 6.7 | 2.1 | 36 | 5.7 |
| KS7436 | 1,076 | 40.0 | 58 | 34 | 111 | 5.3 | 7.0 | 1.8 | 40 | 3.7 |
| KS9124 | 1,017 | 38.6 | 59 | 30 | 110 | 5.3 | 6.0 | 3.1 | 42 | 4.0 |
| KS9135 | 1,069 | 38.8 | 60 | 29 | 111 | 6.3 | 8.0 | 4.5 | 40 | 3.0 |
| KS9183 | 1,019 | 38.6 | 58 | 31 | 111 | 6.0 | 7.0 | 4.9 | 40 | 3.7 |
| Kronos | 1,134 | 37.7 | 56 | 33 | 111 | 8.0 | 7.7 | 3.6 | 41 | 3.0 |
| Largo | 448 | 36.9 | 54 | 29 | 96 | 5.0 | 8.0 | 3.0 | 32 | 3.3 |
| Plainsman | 555 | 37.5 | 63 | 27 | 114 | 5.3 | 4.7 | 1.1 | 46 | 4.0 |
| Sumner | 987 | 39.5 | 58 | 30 | 108 | 6.3 | 7.0 | 2.6 | 35 | 4.0 |
| Witchita | 1,074 | 38.1 | 60 | 29 | 110 | 5.7 | 7.0 | 2.3 | 38 | 4.3 |
| Mean | 958 | 38.3 | 59 | 31 | 110 | 5.8 | 6.7 | 3.1 | 11 | 3.8 |
| LSD (0.05) | 296.5 | 1.7 | 2.9 | 2.8 | 3.0 | 1.3 | 2.0 | 1.8 | 7.0 | 1.3 |
| Pr > F | 0.0001 | 0.0063 | 0.0001 | 0.0004 | 0.0001 | 0.0004 | 0.0055 | 0.0014 | 0.0247 | 0.0164 |
| C.V. | 18.6 | 2.7 | 3.0 | 5.4 | 1.6 | 13.4 | 17.7 | 35.8 | 10.6 | 19.8 |

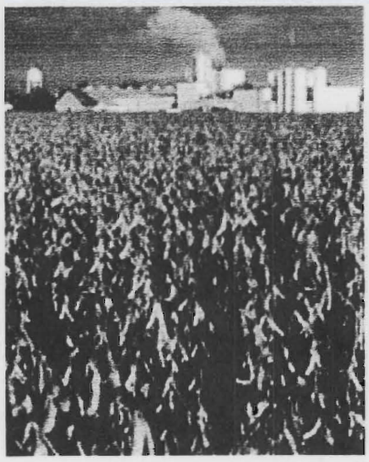
* April 1 was used as the beginning of the growing season because that is when the soil temperature rose above freezing.

Minnesota Agricultural Experiment Station
University of Minnesota

# Soybean

J.H. Orf, S.L. Naeve, P.J. Schaus and A. Killam

## Varietal Trials Results, January 2006



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

The 2005 growing season was warmer than normal. Locations in the northern zone were affected to a greater degree than locations in the southern zone and varieties that normally mature later than the recommended varieties matured.

Tables 1 to 3 present data from the regular public and private variety tests conducted annually at various locations within the northern, central and southern production zones. The map shows test locations and zone boundaries. All tests were planted between May 4 and June 14 at planting rates of 160,000 plants/acre. Herbicides were used as necessary for good weed control. Row spacings were 30 inches at Becker and Jackson, and 10 inches at other locations. Plot combines were used to harvest the plots. The 2004 data from Becker were not included due to a late-season hailstorm.

Tables 4 and 5 provide results of the very early (northern Minnesota) and special southeastern Minnesota variety tests. These locations were added to provide data for environments not represented by the other location tests.

Tables 6 to 9 provide results from specific tests of available Roundup Ready® varieties adapted to the far- northern, central and southern production zones. Data in 2005 from Becker was not included due to a late-season hailstorm.

Tables 10 to 12 provide results from the special performance tests of soybean-cyst-nematode-resistant varieties in "infested" field sites near Lamberton, Waseca and Hayward in the southern zone, and Danvers and Hector in the central zone. "Noninfested" field sites were located near Lamberton, Jackson and Waseca in the southern zone and Morris and Rosemount in the central zones. Planting techniques were the same as for the regular performance tests.

Tables 13 to 17 provide performance and characteristics data from special-use soybean variety tests. These tests were conducted to provide reliable data for growers who are interested in producing these types of soybeans, which are typically grown under contract.

Table 18 provides important variety characteristics of publicly developed varieties entered in the 2005 tests.

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

### Relative Maturity and Calendar Dates of Maturity

Soybeans respond to changing day length, so the actual calendar date of maturity achievement is affected by latitude. Each variety has a narrow range of north-south adaptation.

Soybean yield and quality are assured if a variety arrives at physiological maturity before a season-ending freeze occurs. This date is determined visually by noting the actual date when 95 percent of the pods show their genetically programmed mature color. These dates for 2005 are provided in the tables. Harvest dates are typically 7 to 14 days later, depending upon drying conditions.

Relative maturity ratings are also provided for each variety. These ratings consist of a number for the maturity group designation (000, 00, 0, 1, 2) followed by a decimal and another number, ranging from 0 to 9, which indicates a ranking within each maturity group. For example the variety MN0302 is indicated as 0.3, making it an early group 0 variety, while MN0901, with a 0.9 rating, is the latest. These values for public varieties are developed after observing them for several years in many locations. Relative maturity ratings for private varieties in these tables were provided by their owners; they 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 2005 calendar date of maturity and not yield performance.


Soybean maturity zones.

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.

The 2005 yield information is presented as a percent of the mean of the test. The actual mean value is given at the bottom of each table. Varieties with values greater than 100 had a yield greater than the mean; those with values less than 100 yielded less than the mean.

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

### *Chlorosis*

Chlorosis ratings are based on how much of the leaf area was yellowing in tests conducted on high-lime (high pH) soils near Foxhome in 2005. Comparing chlorosis scores of varieties enables you to estimate how well they perform relative to each other. Actual chlorosis ratings can vary depending on the specific site and year of test. Specific scores and evaluation dates from the 2005 tests are provided at the web site www.soybeans.umn.edu/home.htm.

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

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

### *Protein and Oil*

Protein and oil values were determined from mature seed using near infrared reflectance (NIR) analysis equipment. **The table values are for the 2005 season only, and protein and oil information is presented as a percent of the mean of the test. The actual mean values are given at the bottom of each table.** Values over 100 indicate the protein and/or oil contents of the variety were greater than the mean value while values less than 100 indicate protein and/or oil contents less than the mean. **Absolute values of protein and oil can vary from year to year.** The mean protein and oil values are expressed on a 13-percent-moisture basis. This formula converts the protein and oil values to another moisture basis:

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

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

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

*Where:*

APV = Approximate value of a bushel of soybeans

Po = soybean oil price (in $ per pound)

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

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

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

*And:*

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

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

### *Phytophthora:*

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

Some published information refers to Phytophthora "tolerance" or "field resistance," which is not racespecific 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 shows which resistance genes provide resistance to the various races.

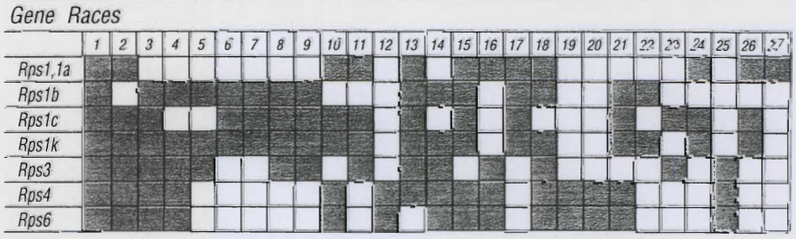
### *Soybean Cyst Nematode*

Soybean Cyst Nematode (SCN), first identified in Minnesota in 1978, 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 their impact on yield.

Yield performance results of susceptible (S), moderately susceptible (MS), moderately resistant (MR) and resistant (R) varieties planted in infested and noninfested fields in southern Minnesota are provided in Table 11. The ratings for SCN resistance were determined using nematode counts from naturally infested field sites and a greenhouse test using a Minnesota field population of SCN.

For proper management of fields with SCN it is recommended that varieties with an R rating be planted. If the SCN population numbers are relatively low – less than 3000 – a variety with an MR rating might be considered. although SCN reproduction is less on MS-rated varieties than on S-rated varieties, for practical purposes these varieties should not be considered for planting in fields where SCN is present and being managed.

### *Genes for resistance to various races of Phytophthora root rot.*



Management information is available from the web site, www.soybeans.umn.edu or from the Minnesota Soybean Research and Promotion Council, 360 Pierce Avenue, Suite 110, North Mankato, MN 56003, 1-888-896-9678, www.mnsoybean.org

### White Mold

White mold, also known as Sclerotinia stem rot, develops in infested fields when high relative humidity and moderate temperatures occur during soybean flowering. Planting less susceptible varieties in wider row spacings or at lower populations is the most effective method of reducing white mold 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. Because of this variability, a variety's performance can change significantly among locations and years depending on the interaction of plant development, precipitation, relative humidity and temperature. White mold severity also tends to be greater if lodging occurs.

Growers concerned about variety performance in the presence of white mold should select varieties that have shown consistently less white mold during several years of testing.

### Brown Stem Rot

Brown stem rot (BSR) is a fungal disease that can cause yield losses in certain situations. The disease occurs most frequently when soybeans follow soybeans, but can occur where soybeans are planted every-other year.

Resistant varieties, or longer rotations, assist in the management of this disease. MN0304, MN0902CN, MN1302, Freeborn, IA1006, and IA2008R are available public varieties with resistance to BSR. Latham E1935A and Latham E2045A are privately developed varieties 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

Recently there has been increased interest in producing soybeans with special characteristics important to specialty food product manufacturers. Soybean scientists previously developed some of these special-use varieties, which were general releases, but more recently varieties have been released under exclusive or nonexclusive licenses to specific companies who then contract with growers for production. Contact Minnesota Crop Improvement Association at www.mncia@umn.edu or phone 612-625-7766 for information.

***Brand names, addresses, phone and web URL or e-mail information for companies entered in 2005 tests.***

| | | |
|---|---|---|
| **Advantage Brand Soybean Seed,** 17303 Highway 22, Good Thunder, MN 56037 | 507-278-4087 | Adv@myclearwave.net |
| **Garst Seed Company (Garst/Agripro),** 2369 330th St., Box 500, Slater, IA 50244 | 320-769-4445 | www.garstseed.com |
| **Albert Lea Seed House (Viking),** P.O. Box 127, 1414 W. Main, Albert Lea, MN 56007 | 507-373-3161 | brian@alseed.com |
| **Anderson Seeds (Anderson),** 37825 County Rd 63, St. Peter, MN 56082 | 507-246-5032 | njanders@hickorytech.net |
| **Bluestem Farm Supply,** 55346 390th St., Mountain Lake, MN 56159 | 507-427-2097 | ericksonlee@earthlink.net |
| **Circle C Seeds (Northern Soypro),** 2493 380th Street, Gary, MN 56545 | 218-356-8214 or 800-245-1638 | ccseeds8214@arvig.net. |
| **Dairyland Seed Co., Inc. (Dairyland),** 3570 Hwy. H, West Bend, WI 53095 | 515-233-9610 | www.dairylandseed.com |
| **Dyna-Gro (Dyna-Gro),** 11935 County Hwy 1, Fergus Falls, MN 56537 | 218-731-6792 | stan.rund@uap.com |
| **Earthwise Processors (Earthwise),** 4111 30th Ave. S., Moorhead, MN 56560 | 218-287-5510 | Jay@Earthwisepro.com |
| **Farm Advantage,** 1275 Hwy 69, Belmond, IA 50421 | 641-444-3344 | jmeints@kalnet.com |
| **Galena Genetics (Galena),** 501 Main St., P.O. Box 548, Ormsby, MN 56162 | 507-736-2004 | shelah_oltmans@rabbeusa.com |
| **Gold Country Seed,** 16506 Hwy. 15 N., P.O. Box 604, Hutchinson, MN 55350 | 320-587-1050 | jleafblad@goldcountryseed.com |
| **Hyland Seeds (Hyland),** 2 Hyland Drive, Blenheim, Ontario, Canada NOP 1A0 | 519-676-8146 | jolmsted@hylandseeds.com |
| **Kaltenberg Seeds (Kaltenberg),** PO Box 278, Waunakee, WI 53597 | 608-849-2312 | ksfseeds@chorus.net |
| **Kruger Seed Company (Kruger),** 33938 160th Ave., Box A, Dike, IA 50624 | 800-772-2721 | info@krugerseeds.com |
| **KSC/Challenger (KSC/Challenger),** 33938 160th Ave., Box A, Dike, IA 50624 | 800-772-2721 | info@krugerseeds.com |
| **Latham Farms (Latham),** 131 180th St., Alexander, IA 50420 | 641-692-3258 | markg@lathamseeds.com |
| **Latham Seed Company (Latham),** 131 180th St., Alexander, IA 50420 | 641-692-3258 | markg@lathamseeds.com |
| **LG Seeds (LG Seeds),** N8181 940th St., River Falls, WI 54022 | 715-821-7788 | www.lgseeds.com |
| **Monsanto (Asgrow/Dekalb),** 800 N. Lindberg Blvd., St. Louis, MO 63167 | 815-758-9323 | www.monsanto.com |
| **Mustang Seeds (Mustang),** Madison, SD 57042 | 605-480-1047 | info@mustangseeds.com |
| **Northland Seed & Grain (Northland Organics),** 462 Holly Ave., St Paul, MN 55102 | 651-271-4402 | soybean@northlandorganic.com |
| **North Star Genetics,** P.O. Box 40, Wanamingo, MN 55983 | — | nsgen1@frontiernet.net |
| **Nutech Seed (Nutech Seed),** 6131 North Fork Rd., Ames, IA 50010 | 800-368-9528 | — |
| **Pattison Bros (Pattison Bros Brand),** 701 King St., Box 670, Fayette, IA 52142 | 800-632-5952 | dillont@pattisonbros.com |

| | | |
|---|---|---|
| **Peterson Farm Seed (PFS),** 3104 164th Ave. SE, Harwood, ND 58042 | 701-282-7476 | jerad@greatsoybeans.com |
| **Pioneer Hi-Bred International,** 99 Navaho Ave., Suite 101A, Mankato, MN 56001 | 507-625-3045 | alan.scot@pioneer.com |
| **Precison Soya,** 105 North First St., Olivia, MN 56277 | 320-523-5965 | ukrk003@umn.edu |
| **Prairie Brand Research (PBR),** 15 X Ave., Story City, IA 50248 | 515-733-2101 | mike@prairiebrandseed.com |
| **Prairie Brand Seed Co. (Prairie Brand)** 15 X Ave., Story City, IA 50248 | 515-733-2101 | mike@prairiebrandseed.com |
| **Proseed (Proseed),** 705 E Brewster, Harvey, ND 58341 | 701-324-4177 | proseed@ndak.net |
| **Renk Seed Co. (Renk),** 6800 Wilburn Rd., Sun Prairie, WI 53590 | 608-837-7351 | arenk@renkseed.com |
| **Richland Organics,** 100N 10th St., Breckenridge, MN 56520 | 218-643-1797 | andy@richlandorganics.com |
| **Sand Seed Service, Inc. (Sands),** P.O. Box 648, Marcus, IA 51035 | 712-376-4135 | soi@midlands.net |
| **Sansgaard Seed Farms, Inc. (Sansgaard),** 15 X Ave., Story City, IA 50248 | 515-733-2101 | mike@prairiebrandseed.com |
| **Seeds 2000,** P.O. Box 200, Breckenridge, MN 56520 | 888-786-7333 | info@seeds2000.net |
| **Sodak Genetics (Sodak Genetics),** Box 2207A, SDSU, Brookings, SD 57007 | 605-688-5418 | jackingemansen@sdstate.edu |
| **Star Brand Research (Star)** P.O. Box 648, Marcus IA 51035. | 712-376-4135 | soi@midlands.net |
| **Syngenta Seeds (NK Brand),** 26241 Anna Lake Rd., Underwood, MN 56586 | 218-826-6380 | jay.stroh@syngenta.com |
| | 800-445-0956 | gary.prescher@syngenta.com |
| **Thompson Seeds (Thompson Seeds),** 4032 130th Ave., Leland, IA 50453 | 641-567-3350 | — |
| **Thunder Seed (Thunder),** 3008 210th St. N., Hawley, MN 54549 | 888-684-8633 | Peterman@fargocity.com |
| **Top Farm Hybrids (Top Farm),** P.O. Box 850, Cokato, MN 55321 | 320-286-5516 | ron@topfarm.com |
| **Trelay Seeds (High Cycle),** 11623 State Rd. 80, Livingston, WI 53544 | 608-943-6363 | jasonb@trelay.com |
| **Wensman Seed Company,** P.O. Box 190, Wadena, MN 56482 | 218-631-2954 | wensman@wensmanseed.com |
| **Ziller Seed Co., Inc. (Ziller),** 76374 380th St., Bird Island, MN 55310 | 320-365-3674 | zscsales@zillerseed.com |

***Table 1. Performance and characteristics of public and private soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytoph-thora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| MN0071 | Minn.AES | 9-10 | 96 | 92 | 92 | 97 | 109 | 00.7 | Rps1 | 2.2 |
| Jim | N.D. AES | 9-13 | 101 | 102 | 93 | 95 | 100 | 00.8 | S | 2.3 |
| MN0091 | Minn.AES | 9-15 | — | — | 92 | 100 | 99 | 00.9 | Rps6 | 2.3 |
| Glacier | Minn.AES | 9-16 | 90 | 87 | 91 | 98 | 97 | 008 | Rps6 | 2.7 |
| Traill | N.D. AES | 9-17 | 112 | 114 | 106 | 102 | 98 | 0.0 | Rps1 | 2.3 |
| MN0201 | Minn.AES | 9-20 | 100 | 100 | 97 | 106 | 92 | 0.2 | Rps1 | 2.5 |
| MN0101 | Minn.AES | 9-21 | — | — | 109 | 103 | 95 | 0.1 | Rps1 | 2.2 |
| Walsh | N.D. AES | 9-22 | 95 | 94 | 95 | 98 | 101 | 0.2 | Rps6 | 2.5 |
| MN0304 | Minn.AES | 9-23 | 99 | 105 | 105 | 99 | 104 | 0.3 | Rps1k | 2.5 |
| MN0302 | Minn.AES | 9-24 | 102 | 102 | 101 | 101 | 103 | 0.3 | Rps1k | 2.5 |
| Lambert | Minn.AES | 9-29 | 105 | 104 | 105 | 100 | 106 | 0.7 | Rps1 | 3.0 |
| Mean | | 9-19 | 34.7 bu/a | 37.5 bu/a | 43.9 bu/a | 33.8% | 18.3% | | | |
| LSD 20% | | | 4% | 6% | 6% | | | | | |

***Table 2. Performance and characteristics of public and private soybean varieties, central zone; Becker, Morris and Rosemount, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytoph-thora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| MN0302 | Minn. AES | 9-10 | 104 | 103 | 84 | 102 | 103 | 0.3 | Rps1k | 1.8 |
| Barnes | N.D. AES | 9-11 | 97 | 95 | 86 | 97 | 107 | 0.2 | Rps6 | 3.0 |
| PAG08 | Precision Soya | 9-13 | — | — | 95 | 102 | 97 | 0.8 | Rps1c | 2.3 |
| Lambert | Minn. AES | 9-14 | 118 | 118 | 98 | 103 | 100 | 0.7 | Rps1 | 2.8 |
| MN0902CN | Minn. AES | 9-14 | 110 | 107 | 88 | 104 | 96 | 0.9 | S | 2.7 |
| PAG11 | Precision Soya | 9-15 | — | — | 102 | 101 | 98 | 1.1 | S | 3.3 |
| MN1006CN | Minn. AES | 9-15 | 115 | 109 | 99 | 100 | 100 | 1.0 | Rps1 | 3.0 |
| Surge | MN & SD AES | 9-15 | 115 | 117 | 99 | 104 | 98 | 0.9 | Rps1 | 2.5 |
| PAG09 | Precision Soya | 9-15 | — | — | 95 | 98 | 101 | 0.9 | S | 2.5 |
| MN1005 | Minn. AES | 9-16 | 124 | 130 | 106 | 99 | 101 | 1.0 | Rps1k | 3.2 |
| MN1302 | Minn. AES | 9-16 | 120 | 121 | 102 | 96 | 100 | 1.3 | Rps1k | 2.8 |
| Kato | Minn. AES | 9-17 | 110 | 115 | 92 | 109 | 94 | 1.3 | Rps1 | 3.2 |
| NT-155 | NuTech | 9-19 | — | — | 112 | 98 | 98 | 1.5 | S | 3.2 |
| FA1545 | Farm Advantage | 9-20 | 134 | 141 | 115 | 103 | 98 | 1.5 | S | 2.5 |
| Parker | Minn. AES | 9-20 | 118 | 128 | 110 | 98 | 101 | 1.5 | Rps1 | 2.5 |
| Freeborn | Minn. AES | 9-20 | 109 | 110 | 93 | 104 | 96 | 1.6 | Rps1 | 3.3 |
| PAG15 | Precision Soya | 9-21 | — | — | 110 | 99 | 99 | 1.5 | S | 2.5 |
| NT-140 | NuTech | 9-22 | — | — | 120 | 100 | 98 | 1.4 | S | 3.5 |
| Mean | | 9-16 | 48.4 bu/a | 49.1 bu/a | 65.8 bu/a | 35.1% | 19.1% | | | |
| LSD 20% | | | 4% | 4% | 5% | | | | | |

***Table 3. Performance and characteristics of public and private soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| MN1302 | Minn. AES | 9-20 | 96 | 95 | 89 | 98 | 102 | 1.3 | Rps1k | 2.5 |
| Freeborn | Minn. AES | 9-21 | 92 | 91 | 82 | 105 | 100 | 1.6 | Rps1 | 2.7 |
| Parker | Minn. AES | 9-23 | 102 | 101 | 95 | 103 | 100 | 1.5 | Rps1 | 2.8 |
| IA1006 | Iowa AES | 9-25 | 99 | 101 | 95 | 101 | 101 | 1.6 | S | 3.0 |
| MN1801 | Minn. AES | 9-25 | 95 | 97 | 93 | 103 | 103 | 1.8 | Rps1c | 3.3 |
| 2318 | Gold Country | 9-26 | — | — | 102 | 104 | 99 | 1.8 | S | 2.5 |
| IA1008 | Iowa AES | 9-26 | 98 | 96 | 99 | 100 | 99 | 2.0 | S | 2.8 |
| NT-211 | NuTech | 9-27 | — | — | 113 | 101 | 97 | 2.1 | S | 2.7 |
| L1763 Brand | Latham | 9-27 | — | — | 105 | 100 | 99 | 1.7 | S | 3.7 |
| 1884 | Viking | 9-27 | 114 | 113 | 103 | 103 | 100 | 1.8 | S | 2.3 |
| FA1936 | Farm Advantage | 9-27 | — | — | 103 | 98 | 101 | 1.9 | S | 2.7 |
| FA1846 | Farm Advantage | 9-27 | 107 | 106 | 102 | 101 | 100 | 1.8 | S | 2.5 |
| Sturdy | Minn. AES | 9-27 | 98 | 98 | 93 | 101 | 104 | 2.0 | Rps1 | 2.5 |
| K-1999 | Kruger | 9-28 | — | — | 106 | 99 | 101 | 1.9 | S | 3.2 |
| IA2050 | Iowa AES | 9-28 | 100 | 101 | 91 | 102 | 100 | 2.1 | S | 3.0 |
| NT-207 | NuTech | 9-29 | — | — | 110 | 99 | 100 | 2.0 | S | 2.7 |
| 2265 | Viking | 9-30 | — | — | 112 | 102 | 101 | 2.2 | S | 3.0 |
| FA2145N | Farm Advantage | 10-2 | — | — | 110 | 100 | 101 | 2.1 | S | 2.8 |
| NT-262 | NuTech | 10-2 | — | — | 103 | 104 | 104 | 2.4 | S | 3.8 |
| IA2008R | Iowa AES | 10-2 | 100 | 101 | 94 | 101 | 98 | 2.1 | Rps1k | 2.7 |
| K-2320SCN | KSC/Challenger | 10-3 | — | 114 | 112 | 102 | 98 | 2.3 | S | 3.2 |
| 23G02 | Galena Genetics | 10-3 | — | — | 101 | 102 | 99 | 2.3 | S | 2.8 |
| Mean | | 9-27 | 49.7 bu/a | 55.9 bu/a | 69.4 bu/a | 34.9% | 19.6% | | | |
| LSD 20% | | | 4% | 5% | 6% | | | | | |

***Table 4. Performance and characteristics of very early maturing soybean varieties; Grand Rapids, Kennedy, Roseau and Thief River Falls, 2003-2005.***

| Variety | Maturity Rating | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Phytophthora Genel | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|
| MN0071 | 00.7 | 101 | 100 | 97 | 100 | 97 | Rps1 | 2.2 |
| Jim | 00.7 | 99 | 99 | 99 | 100 | 83 | S | 3.5 |
| Traill | 0.0 | 98 | 99 | 101 | 107 | 81 | S | 2.7 |
| MN0101 | 0.1 | 101 | 102 | 103 | 104 | 83 | Rps1 | 2.7 |
| Mean | | 32.9 bu/a | 29.0 bu/a | 35.1 bu/a | 35.4% | 18.3% | | |
| LSD 20% | | 6% | 4% | 6% | | | | |

***Table 5. Performance and characteristics of soybean varieties, southeastern Minn., 2001-2005.***

| Variety | Maturity Rating | Yield, Percent of Mean 2001-2005 | 2003-2005 | 2005 | Percent of Mean Protein | Oil | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|
| MN1005 | 1.0 | — | 104 | 105 | 98 | 103 | Rps1k | 2.5 |
| Kato | 1.3 | — | — | 93 | 111 | 94 | Rps1 | 2.5 |
| MN1302 | 1.3 | 99 | 99 | 92 | 90 | 106 | Rps1k | 2.5 |
| Parker | 1.5 | 98 | 97 | 96 | 99 | 101 | Rps1 | 2.6 |
| 91B53 | 1.5 | 97 | 90 | 96 | 102 | 101 | S | 2.5 |
| IA1006 | 1.6 | 103 | 108 | 97 | 101 | 98 | S | 3.0 |
| Freeborn | 1.6 | 92 | 89 | 87 | 100 | 102 | Rps1 | 2.6 |
| MN1801 | 1.8 | 98 | 95 | 101 | 101 | 102 | Rps1c | 2.8 |
| IA1008 | 2.0 | 102 | 105 | 102 | 101 | 96 | S | 2.5 |
| Sturdy | 2.0 | 101 | 98 | 90 | 104 | 98 | Rps1 | 2.4 |
| IA2065 | 2.1 | — | — | 117 | 97 | 106 | S | 2.6 |
| IA2068 | 2.1 | — | — | 114 | 95 | 102 | S | 2.5 |
| IA2050 | 2.1 | 108 | 110 | 111 | 98 | 100 | S | 2.8 |
| IA2008R | 2.1 | — | 105 | 99 | 101 | 96 | Rps1k | 2.7 |
| Mean | | 40.2 bu/a | 40.1 bu/a | 42.5 bu/a | 36.7% | 18.1% | | |
| LSD 20% | | 3% | 3% | 4% | | | | |

***Table 6. Performance and characteristics of conventional and Roundup Ready public and private soybean varieties, far northern zone; Roseau, Thief River Falls, Crookston and Kennedy, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| MN0071 | Minn. AES | 9-21 | 103 | 102 | 97 | 99 | 104 | 00.7 | Rps1 | 2.2 |
| RR50-06 | Proseed | 9-21 | — | — | 90 | 101 | 99 | 0.06 | S | 2.8 |
| 06006RR | PFS | 9-21 | — | — | 80 | 99 | 99 | 00.6 | N | 2.8 |
| Jim | N.D. AES | 9-24 | 101 | 101 | 99 | 99 | 89 | 00.8 | S | 3.5 |
| Colibri | Earthwise | 9-24 | — | — | 93 | 101 | 91 | 00.3 | S | 2.7 |
| Bravado | Earthwise | 9-25 | — | — | 108 | 96 | 103 | 00.9 | N | 2.8 |
| RR50-04 | Proseed | 9-25 | — | — | 101 | 101 | 102 | 0.04 | Rps1k | 2.8 |
| X5005R | NK Brand | 9-25 | — | — | 101 | 104 | 98 | 00.5 | S | 2.7 |
| RR Ramsey | Hyland Seeds | 9-25 | — | — | 94 | 98 | 103 | 00.5 | S | 2.8 |
| 30B04 | Dyna-Gro | 9-26 | — | — | 115 | 95 | 104 | 0.04 | Rps1k | 2.8 |
| NS0049RR | NorthStar Genetics | 9-26 | — | — | 102 | 100 | 104 | 00.8 | Rps1 | 2.3 |
| Atwood | Earthwise | 9-27 | — | — | 109 | 105 | 97 | 00.8 | Rps1 | 2.7 |
| 06004RR | PFS | 9-27 | — | — | 106 | 95 | 103 | 00.4 | Rps1k | 2.5 |
| NS0110RR | NorthStar Genetics | 9-27 | — | — | 102 | 101 | 103 | 00.9 | S | 2.7 |
| W20051RR | Wensman | 9-27 | — | — | 102 | 96 | 102 | 00.5 | Rps1k | 2.5 |
| Traill | N.D. AES | 9-27 | 100 | 102 | 101 | 106 | 87 | 0.0 | S | 2.7 |
| PB00425RR | Prairie Brand | 9-27 | — | — | 100 | 96 | 104 | 00.4 | Rps1k | 2.7 |
| RR20-05 | Proseed | 9-27 | — | — | 97 | 100 | 102 | 0.05 | S | 3.3 |
| PB00645RR | Prairie Brand | 9-27 | — | — | 95 | 96 | 102 | 00.6 | S | 2.7 |
| W20077RR | Wensman | 9-27 | — | 94 | 89 | 100 | 101 | 00.7 | Rps1k | 2.5 |
| S00-J4 | NK Brand | 9-27 | — | — | 87 | 98 | 103 | 00.4 | S | 3.2 |
| NT-0111RR | NuTech | 9-28 | — | — | 102 | 98 | 105 | 0.1 | S | 3.0 |
| NT-0121+RR | NuTech | 9-28 | — | — | 98 | 95 | 102 | 0.1 | S | 3.0 |
| DSTC9-000/RR | Dairyland | 9-28 | — | — | 97 | 101 | 102 | 00.9 | S | 2.7 |
| 90M01 | Pioneer Brand | 9-28 | — | — | 94 | 100 | 104 | 01 | Rps1k | 2.5 |

***Table 6. Performance and characteristics of conventional and Roundup Ready public and private soybean varieties, far northern zone; Roseau, Thief River Falls, Crookston and Kennedy, 2003-2005 (continued).***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| RG200 | RoughRider Genetics | 9-28 | 94 | 92 | 91 | 105 | 86 | 0.0 | S | 2.7 |
| NS0056RR | NorthStar Genetics | 9-29 | — | — | 102 | 98 | 102 | 00.9 | Rps1k | 2.5 |
| RR Royal | Hyland Seeds | 9-29 | — | — | 99 | 99 | 99 | 00.9 | S | 2.3 |
| NS0099RR | NorthStar Genetics | 9-29 | — | — | 97 | 99 | 102 | 00.9 | Rps1k | 2.8 |
| S01-T5 | NK Brand | 9-29 | — | — | 96 | 108 | 95 | 0.1 | S | 3.3 |
| 04009RR | PFS | 9-29 | 96 | 94 | 92 | 96 | 103 | 00.9 | Rps1k | 2.8 |
| DSR-C800/RR | Dairyland | 9-30 | — | — | 110 | 98 | 103 | 00.9 | S | 2.2 |
| PB00943RR | Prairie Brand | 9-30 | — | 112 | 110 | 99 | 102 | 0.1 | Rps1k | 2.2 |
| M-0096 | Mustang | 9-30 | — | — | 108 | 100 | 101 | 0.009 | S | 2.5 |
| S02-M9 | NK Brand | 9-30 | — | — | 108 | 102 | 101 | 0.2 | S | 3.0 |
| RR50-07 | Proseed | 9-30 | — | — | 103 | 98 | 103 | 0.07 | Rps1k | 2.5 |
| W20091RR | Wensman | 9-30 | — | 108 | 102 | 101 | 100 | 00.9 | Rps1k | 2.2 |
| MN0101 | Minn. AES | 9-30 | 103 | 105 | 102 | 103 | 89 | 0.1 | Rps1 | 2.7 |
| NT-0102RR | NuTech | 9-30 | — | — | 97 | 96 | 100 | 0.1 | S | 2.7 |
| MK0205 | Richland Organics | 9-30 | — | 105 | 92 | 104 | 96 | 0.1 | N | 2.8 |
| K-009+RR | Kruger | 10-1 | — | — | 109 | 100 | 102 | 00.9 | S | 2.3 |
| 30M09 | Dyna-Gro | 10-1 | — | — | 108 | 100 | 102 | 0.09 | S | 3.5 |
| NT-0090RR | NuTech | 10-1 | — | — | 104 | 102 | 103 | 00.9 | S | 2.5 |
| PB00965RR | Prairie Brand | 10-1 | — | — | 102 | 101 | 102 | 00.9 | S | 2.5 |
| W20092RR | Wensman | 10-2 | — | — | 109 | 102 | 102 | 00.9 | S | 3.0 |
| T-0222+RR | Thompson Seeds | 10-3 | — | — | 106 | 101 | 101 | 0.2 | Rps1k | 3.2 |
| Mean | | 9-28 | 32.3 bu/a | 28.2 bu/a | 35.3 bu/a | 35.4% | 18.3% | | | |
| LSD 20% | | | 4% | 4% | 6% | | | | | |

***Table 7. Performance and characteristics of Roundup Ready soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytoph-thora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| AG00603 | Asgrow | 9-12 | — | — | 81 | 96 | 100 | 0.06 | Rps1 | 1.8 |
| T-0111RR | Thompson Seeds | 9-14 | — | — | 94 | 102 | 105 | 0.1 | S | 2.2 |
| 90M01 | Pioneer Brand | 9-14 | — | — | 90 | 102 | 104 | 0.001 | Rps1k | 2.0 |
| RR Ramsey | Hyland Seeds | 9-15 | 96 | 94 | 94 | 108 | 104 | 00.5 | S | 2.5 |
| 0051RR | Seeds 2000 | 9-15 | — | — | 92 | 105 | 101 | 00.5 | S | 2.0 |
| PB-00845RR | Prairie Brand | 9-17 | — | — | 106 | 99 | 105 | 00.8 | Rps1k | 2.3 |
| DSR-0501/ RRSTS | Dairyland | 9-17 | — | — | 103 | 101 | 103 | 0.5 | S | 2.3 |
| K-009+RR | Kruger | 9-17 | — | — | 103 | 103 | 103 | 0.09 | S | 1.8 |
| 26009RR | Thunder | 9-17 | — | — | 103 | 103 | 101 | 00.9 | S | 1.8 |
| PB-00965RR | Prairie Brand | 9-17 | — | — | 100 | 105 | 105 | 00.9 | S | 2.5 |

*Table 7. Performance and characteristics of Roundup Ready soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2003-2005 (continued).*

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| DKB009-51 | Dekalb | 9-17 | — | — | 89 | 102 | 102 | 0.09 | N | 1.8 |
| DSR-C900/RR | Dairyland | 9-17 | — | — | 87 | 95 | 100 | 00.0 | S | 1.3 |
| X402R | NK Brand | 9-18 | — | — | 103 | 106 | 100 | 0.2 | S | 2.5 |
| W20092RR | Wensman | 9-18 | — | — | 103 | 102 | 104 | 00.9 | S | 1.5 |
| RR Royal | Hyland Seeds | 9-18 | — | — | 102 | 105 | 103 | 00.9 | S | 2.7 |
| 2502RR | Thunder | 9-18 | — | — | 98 | 102 | 101 | 0.2 | S | 1.0 |
| PB-0234RR | PBR | 9-18 | — | 98 | 92 | 99 | 102 | 0.2 | S | 2.3 |
| 0502RR | Peterson Farms | 9-18 | — | — | 91 | 101 | 101 | 0.2 | S | 2.0 |
| SX05203 | Dyna-Gro | 9-19 | — | — | 106 | 101 | 100 | 0.3 | Rps1k | 1.7 |
| E34254RR | Top Farm | 9-19 | — | — | 103 | 97 | 104 | 0.2 | S | 1.8 |
| RR40-20 | Proseed | 9-19 | — | — | 99 | 64 | 68 | 0.2 | S | 2.2 |
| PB-00943RR | PBR | 9-19 | — | 98 | 97 | 104 | 101 | 0.1 | Rps1k | 1.8 |
| 31F02 | Dyna—Gro | 9-19 | — | — | 96 | 98 | 105 | 0.2 | S | 1.8 |
| K-033RR | Kruger | 9-20 | — | — | 107 | 102 | 102 | 0.3 | S | 2.5 |
| W2020RR | Wensman | 9-20 | — | — | 103 | 101 | 102 | 0.2 | S | 1.5 |
| T-0121+RR | Thompson Seeds | 9-20 | — | — | 102 | 96 | 98 | 0.1 | S | 2.8 |
| M-025RR | Mustang | 9-20 | — | 95 | 87 | 97 | 106 | 0.2 | S | 2.3 |
| 6002RR | Top Farm | 9-20 | — | — | 86 | 103 | 99 | 0.00 | S | 2.5 |
| AG0301 | Asgrow | 9-21 | 107 | 110 | 110 | 98 | 101 | 0.3 | Rps1k | 1.8 |
| S04-29 | NK Brand | 9-21 | — | — | 108 | 105 | 100 | 0.4 | S | 2.0 |
| W2040RR | Wensman | 9-21 | — | — | 108 | 101 | 105 | 0.4 | Rps1k | 1.5 |
| 90M20 | Pioneer Brand | 9-21 | — | 104 | 103 | 99 | 102 | 0.2 | Rps1k | 2.2 |
| RR Reliant | Hyland Seeds | 9-21 | — | — | 100 | 105 | 102 | 0.3 | S | 2.0 |
| RR20-11 | Proseed | 9-21 | 92 | 98 | 96 | 102 | 103 | 0.1 | Rps1k | 2.8 |
| DSR-0401/RR | Dairyland | 9-22 | — | — | 110 | 105 | 104 | 0.4 | S | 2.0 |
| T-0222+RR | Thompson Seeds | 9-22 | — | — | 106 | 100 | 106 | 0.2 | Rps1 | 1.7 |
| AG0202 | Asgrow | 9-22 | — | — | 103 | 101 | 100 | 0.2 | Rps1k | 2.3 |
| Exp.24104R | Ziller | 9-22 | — | — | 103 | 101 | 100 | 0.3 | S | 2.0 |
| RR50-30 | Proseed | 9-23 | — | — | 99 | 100 | 102 | 0.3 | Rps1k | 3.3 |
| SOI0660RR | Sands of Iowa | 9-23 | — | — | 98 | 101 | 104 | 0.6 | Rps1k | 2.8 |
| K-020RR | Kruger | 9-23 | — | — | 95 | 102 | 101 | 0.2 | S | 2.0 |
| NT-0515RR | NuTech | 9-24 | — | — | 114 | 103 | 99 | 0.3 | S | 2.0 |
| NT-0525RR | NuTech | 9-24 | — | — | 111 | 101 | 101 | 0.3 | S | 1.8 |
| NT-0606RR | NuTech | 9-24 | — | 103 | 105 | 103 | 104 | 0.3 | S | 2.3 |
| 6020RR | Top Farm | 9-24 | — | — | 98 | 99 | 104 | 0.2 | S | 1.7 |
| SOI0452RR | Sands of Iowa | 9-24 | — | — | 96 | 106 | 98 | 0.4 | S | 1.8 |
| M-036RR | Mustang | 9-24 | — | — | 95 | 98 | 100 | 0.3 | N | 1.5 |
| RR Rugged | Hyland Seeds | 9-24 | — | 89 | 87 | 102 | 106 | 0.3 | S | 3.0 |
| RS035RR | Renk | 9-25 | — | — | 110 | 100 | 101 | 0.3 | S | 1.5 |
| PB-0554RR | Prairie Brand | 9-26 | — | 110 | 114 | 103 | 98 | 0.4 | S | 1.8 |
| SOI0547RR | Sands of Iowa | 9-26 | — | — | 114 | 101 | 101 | 0.5 | S | 2.5 |
| W2064RR | Wensman | 9-26 | — | — | 112 | 103 | 100 | 0.6 | S | 1.7 |
| M-055RR | Mustang | 9-26 | — | 108 | 110 | 103 | 99 | 0.5 | S | 1.8 |
| 0305RR | Peterson Farms | 9-26 | 105 | 105 | 107 | 102 | 100 | 0.5 | S | 1.8 |
| NT-0616RR | NuTech | 9-27 | — | — | 116 | 99 | 101 | 0.3 | Rps1 | 1.8 |

***Table 7. Performance and characteristics of Roundup Ready soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2003-2005 (continued).***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| M-066RR | Mustang | 9-27 | — | — | 112 | 99 | 101 | 0.6 | Rps1 | 2.8 |
| PB-0565RR | Prairie Brand | 9-28 | — | — | 115 | 99 | 100 | 0.5 | S | 2.8 |
| RR20-40 | Proseed | 9-28 | — | — | 111 | 100 | 103 | 0.4 | N | 2.3 |
| RG200 | Rough Rider Genetics | 9-28 | 100 | 102 | 99 | 108 | 100 | 0.0 | Rps1 | 2.0 |
| 0506RR | Peterson Farms | 9-30 | — | — | 114 | 100 | 106 | 0.5 | Rps6 | 2.3 |
| Mean | | 9-21 | 40.7 bu/a | 43.6 bu/a | 49.0 bu/a | 33.3% | 18.7% | | | |
| LSD 20% | | | 5% | 6% | 6% | | | | | |

***Table 8. Performance and characteristics of Roundup Ready soybean varieties, central zone; Becker, Rosemount and Morris, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| AG0301 | Asgrow | 9-11 | — | — | 91 | 94 | 100 | 0.3 | Rps1k | 2.5 |
| RR Reliant | Hyland Seeds | 9-13 | — | — | 81 | 98 | 101 | 0.3 | S | 3.5 |
| AG0803 | Asgrow | 9-14 | — | — | 99 | 99 | 107 | 0.8 | Rps1k | 2.0 |
| DSR-0701/RR | Dairyland | 9-14 | — | — | 98 | 103 | 100 | 0.7 | Rps1k | 1.3 |
| AG0801 | Asgrow | 9-15 | 100 | 101 | 100 | 93 | 105 | 0.8 | Rps1k | 1.8 |
| XR08Y31 | Garst Seed | 9-15 | — | — | 97 | 104 | 100 | 0.8 | S | 2.0 |
| RR Randell | Hyland Seeds | 9-15 | — | — | 97 | 99 | 105 | 0.8 | S | 1.5 |
| 90M60 | Pioneer Brand | 9-15 | — | 88 | 87 | 98 | 100 | 0.6 | Rps1c | 1.8 |
| 7063 | Farm Advantage | 9-16 | — | — | 103 | 97 | 101 | 0.6 | S | 2.5 |
| 36N05 | Dyna-Gro | 9-16 | — | — | 98 | 92 | 101 | 0.5 | Rps1 | 2.8 |
| 90M91 | Pioneer Brand | 9-16 | — | — | 98 | 100 | 106 | 0.9 | Rps1k | 2.0 |
| 91M13 | Pioneer Brand | 9-16 | — | — | 98 | 103 | 106 | 1.1 | Rps1k | 1.0 |
| RR40-70 | Proseed | 9-16 | — | — | 98 | 104 | 103 | 0.7 | Rps1 | 2.8 |
| RR50-80 | Proseed | 9-16 | — | — | 98 | 105 | 100 | 0.8 | Rps1k | 2.2 |
| PB-0885NRR | Prairie Brand | 9-16 | — | — | 94 | 104 | 99 | 0.8 | Rps1k | 1.3 |
| RRExp8.5 | Proseed | 9-16 | — | — | 91 | 105 | 97 | 0.8 | Rps1k | 3.2 |
| RR HX540 | Hyland Seeds | 9-16 | — | — | 88 | 104 | 102 | 0.5 | S | 2.0 |
| 708RR | Thunder | 9-17 | — | — | 104 | 104 | 100 | 0.8 | Rps1k | 1.7 |
| 2512RR | Thunder | 9-17 | — | — | 99 | 102 | 96 | 1.2 | S | 1.5 |
| K-056RR | KSC/Challenger | 9-17 | — | — | 96 | 102 | 103 | 0.5 | S | 2.7 |
| SD1092RR | Sodak Genetics | 9-17 | — | — | 91 | 106 | 100 | 0.9 | Rps1k | 1.8 |
| MN0904RR | Minn. AES | 9-17 | 94 | 87 | 91 | 110 | 99 | 0.9 | Rps1k | 1.2 |
| DKB10-52 | Dekalb | 9-18 | — | — | 105 | 102 | 99 | 1.0 | Rps1k | 2.3 |
| 33R09 | Dyna-Gro | 9-18 | — | — | 103 | 104 | 97 | 0.9 | Rps1k | 2.2 |
| 0999RR | Garst Seed | 9-18 | — | — | 101 | 98 | 95 | 1.0 | Rps1k | 3.2 |
| SOI0969RR | Sands of Iowa | 9-18 | — | — | 100 | 103 | 100 | 0.9 | Rps1k | 2.3 |
| RR40-90 | Proseed | 9-18 | — | — | 99 | 106 | 98 | 0.9 | S | 2.3 |
| AG1401 | Asgrow | 9-19 | 106 | 106 | 105 | 96 | 107 | 1.4 | Rps1k | 1.7 |
| NT-0939RR | NuTech | 9-19 | — | — | 104 | 104 | 98 | 0.9 | S | 2.7 |
| RS095RR | Renk | 9-19 | — | — | 101 | 104 | 98 | 0.9 | Rps1k | 2.5 |

***Table 8. Performance and characteristics of Roundup Ready soybean varieties, central zone; Becker, Rosemount and Morris, 2003-2005 (continued).***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| KB086RR | Kaltenberg | 9-19 | — | — | 100 | 102 | 100 | — | Rps1k | 3.8 |
| T-0901RR | Thompson Seeds | 9-19 | — | — | 98 | 102 | 100 | 0.9 | Rps1k | 2.7 |
| K-080RR | KSC/Challenger | 9-19 | — | — | 96 | 104 | 100 | 0.8 | Rps1k | 2.3 |
| 37A10 | Dyna-Gro | 9-20 | — | 105 | 108 | 100 | 104 | 1.0 | Rps1k | 2.0 |
| PB-0965RR | PBR | 9-20 | — | — | 108 | 102 | 102 | 1.0 | S | 1.8 |
| K-098RR | Kruger | 9-20 | — | — | 102 | 97 | 99 | 0.9 | S | 2.3 |
| C0995RR | LG Seeds | 9-20 | — | — | 102 | 106 | 99 | 0.9 | N | 1.8 |
| SD1091RR | Sodak Genetics | 9-20 | 90 | 86 | 94 | 108 | 101 | 0.9 | Rps1 | 2.3 |
| DST09-002/RRSTS | Dairyland | 9-20 | — | — | 93 | 102 | 98 | 0.9 | Rps1k | 2.7 |
| SD1101RR | Sodak Genetics | 9-20 | — | — | 93 | 100 | 104 | 1.0 | Rps1 | 2.0 |
| M-095RR | Mustang | 9-21 | — | 113 | 116 | 103 | 100 | 0.9 | S | 2.2 |
| Exp.44411R | Ziller | 9-21 | — | — | 109 | 101 | 102 | 1.1 | S | 1.5 |
| M-096RR | Mustang | 9-21 | — | — | 107 | 103 | 103 | 0.9 | S | 2.0 |
| T-1555RR | Thompson Seeds | 9-21 | — | — | 107 | 100 | 105 | 1.5 | Rps1k | 3.0 |
| W2090RR | Wensman | 9-21 | — | 98 | 106 | 101 | 97 | 0.9 | S | 2.0 |
| SX05514 | Dyna-Gro | 9-21 | — | — | 104 | 104 | 102 | 1.4 | Rps1k | 3.2 |
| AG1502 | Asgrow | 9-21 | — | — | 102 | 99 | 111 | 1.5 | S | 2.7 |
| SX05611 | Dyna-Gro | 9-21 | — | — | 102 | 99 | 105 | 1.1 | S | 2.0 |
| PB-0923RR | Prairie Brand | 9-21 | 101 | 102 | 102 | 106 | 105 | 0.9 | Rps1k | 2.3 |
| K-122RR | Kruger | 9-21 | — | — | 101 | 103 | 102 | 1.2 | S | 2.5 |
| 2509RR | Gold Country | 9-21 | — | — | 100 | 98 | 102 | 0.9 | S | 1.5 |
| BT7145R | Ziller | 9-21 | — | 97 | 97 | 104 | 100 | 1.4 | Rps1k | 1.5 |
| 91M51 | Pioneer Brand | 9-21 | — | 97 | 96 | 103 | 103 | 1.5 | Rps1k | 2.5 |
| 2143RR | High Cycle | 9-21 | — | — | 95 | 106 | 100 | 1.4 | Rps1k | 1.8 |
| 7123 | Farm Advantage | 9-22 | — | — | 112 | 106 | 102 | 1.2 | Rps1k | 3.0 |
| PB-1405RR | PBR | 9-22 | — | — | 108 | 105 | 100 | 1.4 | Rps1k | 2.5 |
| PB-1525RR | Prairie Brand | 9-22 | — | — | 107 | 102 | 105 | 1.5 | Rps1k | 1.8 |
| DST14-000/RRSTS | Dairyland | 9-22 | — | — | 106 | 108 | 100 | 1.4 | S | 1.8 |
| AG1102 | Asgrow | 9-22 | — | 106 | 105 | 97 | 103 | 1.1 | Rps1k | 2.2 |
| M-136RR | Mustang | 9-22 | — | — | 105 | 104 | 101 | 1.3 | N | 1.8 |
| K-102RR | KSC/Challenger | 9-22 | — | — | 104 | 102 | 102 | 1.0 | S | 2.8 |
| NT-1404RR | NuTech | 9-22 | — | — | 104 | 107 | 98 | 1.4 | Rps1k | 2.5 |
| W2142RR | Wensman | 9-22 | — | — | 104 | 108 | 100 | 1.4 | Rps1k | 2.0 |
| 39D11 | Dyna-Gro | 9-22 | — | — | 103 | 99 | 102 | 1.1 | S | 2.7 |
| K-156RR | Kruger | 9-22 | — | — | 103 | 105 | 99 | 1.4 | Rps1k | 2.5 |
| K-100RR | Kruger | 9-22 | — | — | 100 | 103 | 104 | 1.0 | Rps1k | 2.7 |
| 151CNR | Anderson Seeds | 9-22 | — | 99 | 99 | 103 | 106 | 1.5 | N | 2.3 |
| XR14C08 | Garst Seed | 9-22 | — | — | 99 | 105 | 100 | 1.4 | Rps1k | 2.5 |
| MN1504RR | Minn. AES | 9-22 | — | — | 95 | 105 | 105 | 1.5 | Rps1k | 1.8 |
| SD1151RR | Sodak Genetics | 9-22 | 94 | 90 | 93 | 104 | 102 | 1.4 | Rps1k | 1.7 |
| C1400RR | LG Seeds | 9-23 | — | — | 118 | 101 | 105 | 1.4 | Rps1k | 1.7 |
| ADV1541R | Advantage | 9-23 | — | 112 | 114 | 101 | 102 | 1.5 | N | 2.7 |
| KB135RR | Kaltenberg | 9-23 | — | — | 112 | 99 | 105 | — | N | 3.0 |
| 7103 | Farm Advantage | 9-23 | — | — | 109 | 98 | 102 | 1.0 | S | 2.5 |
| DSR-1301/RR | Dairyland | 9-23 | — | 94 | 107 | 103 | 103 | 1.3 | S | 2.2 |

***Table 8. Performance and characteristics of Roundup Ready soybean varieties, central zone; Becker, Rosemount and Morris, 2003-2005 (continued).***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| 3512RR | Gold Country | 9-23 | — | 101 | 106 | 91 | 105 | 1.2 | Rps1c | 2.0 |
| RS124NRR | Renk | 9-23 | — | — | 103 | 96 | 105 | 1.2 | Rps1c | 2.5 |
| T-1606RR | Thompson Seeds | 9-23 | — | — | 102 | 104 | 102 | 1.5 | Rps1k | 2.5 |
| T-0999+RR | Thompson Seeds | 9-23 | — | — | 101 | 102 | 103 | 0.9 | Rps1k | 1.8 |
| 1560RR | Viking | 9-23 | — | — | 98 | 108 | 100 | 1.5 | S | 2.3 |
| W2121RR | Wensman | 9-23 | — | 98 | 95 | 99 | 101 | 1.2 | Rps1c | 2.2 |
| RS115RR | Renk | 9-24 | — | — | 113 | 100 | 105 | 1.1 | Rps1k | 2.7 |
| 1508RR | Anderson Seeds | 9-24 | 106 | 106 | 110 | 106 | 97 | 1.5 | N | 2.5 |
| M-115RR | Mustang | 9-24 | — | 99 | 108 | 89 | 100 | 1.1 | Rps1c | 1.3 |
| KB155P | Kaltenberg | 9-24 | — | — | 107 | 101 | 100 | — | Rps1k | 1.5 |
| W2150RR | Wensman | 9-24 | — | — | 107 | 107 | 102 | 1.5 | Rps1k | 1.8 |
| 2111RR | High Cycle | 9-24 | — | — | 106 | 91 | 106 | 1.1 | Rps1c | 2.0 |
| NT-1616RR | NuTech | 9-24 | — | — | 106 | 102 | 99 | 1.5 | S | 2.3 |
| 7143 | Farm Advantage | 9-24 | — | — | 104 | 107 | 98 | 1.4 | S | 2.5 |
| 35D15 | Dyna-Gro | 9-24 | — | — | 103 | 105 | 101 | 1.5 | Rps1k | 2.0 |
| 1499RR | Garst Seed | 9-24 | 102 | 101 | 103 | 102 | 103 | 1.4 | S | 1.7 |
| PB-1294RR | Prairie Brand | 9-24 | — | 100 | 101 | 97 | 103 | 1.2 | Rps1c | 2.0 |
| E1330R | Latham | 9-24 | — | — | 100 | 96 | 101 | 1.3 | S | 2.5 |
| BT7115R | Ziller | 9-24 | — | — | 96 | 99 | 100 | 1.1 | S | 1.8 |
| SO1540RR | Sands of Iowa | 9-25 | 106 | 105 | 113 | 99 | 103 | 1.5 | S | 2.5 |
| RS159RR | Renk | 9-25 | 101 | 103 | 111 | 95 | 106 | 1.5 | Rps1c | 1.5 |
| K-149+RR | KSC/Challenger | 9-25 | — | 104 | 109 | 106 | 100 | 1.4 | Rps1k | 1.8 |
| 2154RR | High Cycle | 9-25 | — | 107 | 106 | 106 | 100 | 1.5 | Rps1k | 1.7 |
| ADV1284NR | Advantage | 9-25 | — | — | 103 | 93 | 105 | 1.2 | N | 2.5 |
| 1821RR | Garst Seed | 9-26 | — | 103 | 104 | 99 | 103 | 1.7 | Rps1c | 2.3 |
| XR17Y67 | Garst Seed | 9-27 | — | — | 119 | 94 | 101 | 1.7 | S | 2.0 |
| KB176RR | Kaltenberg | 10-1 | — | — | 39 | 48 | 54 | — | Rps1k | 2.0 |
| Mean | | 9-20 | 46.2 bu/a | 47.3 bu/a | 59.7 bu/a | 34.9% | 18.1% | | | |
| LSD 20% | | | 6% | 6% | 7% | | | | | |

***Table 9. Performance and characteristics of Roundup Ready soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| 91M60 | Pioneer Brand | 9-18 | — | — | 84 | 97 | 99 | 1.6 | Rps1c | 2.3 |
| MN1504RR | Minn. AES | 9-19 | — | — | 95 | 98 | 103 | 1.5 | Rps1k | 2.0 |
| XR14C08 | Garst Seed | 9-19 | — | — | 87 | 103 | 100 | 1.4 | Rps1k | 3.3 |
| M98-332069 | Minn. AES | 9-19 | — | 84 | 83 | 105 | 100 | 1.5 | Rps1k | 2.7 |
| AG1502 | Asgrow | 9-19 | — | — | 80 | 99 | 105 | 1.5 | S | 1.8 |

***Table 9. Performance and characteristics of Roundup Ready soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2003-2005 (continued).***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| PB-1525RR | Prairie Brand | 9-20 | — | — | 95 | 99 | 102 | 1.5 | Rps1k | 1.5 |
| 151CNR | Anderson Seeds | 9-21 | — | 91 | 89 | 103 | 101 | 1.5 | Rps1k | 3.0 |
| 91M70 | Pioneer Brand | 9-23 | — | — | 100 | 99 | 98 | 1.7 | Rps1k | 2.2 |
| T-1616RR | Thompson Seeds | 9-23 | — | — | 98 | 100 | 102 | 1.6 | S | 2.7 |
| 91M91 | Pioneer Brand | 9-23 | — | — | 96 | 99 | 101 | 1.9 | Rps1k | 2.2 |
| DSR-1500/RRSTS | Dairyland | 9-23 | — | — | 94 | 102 | 98 | 1.5 | N | 2.3 |
| 1827RR/STS | Garst Seed | 9-23 | — | — | 93 | 103 | 100 | 1.8 | Rps1k | 2.5 |
| RS165RR | Renk | 9-23 | — | — | 93 | 101 | 102 | 1.6 | S | 2.7 |
| BT7160R | Ziller | 9-24 | — | — | 94 | 100 | 103 | 1.6 | N | 2.2 |
| 2184RR | High Cycle | 9-24 | — | — | 91 | 101 | 100 | 1.8 | N | 1.5 |
| XR17Y67 | Garst Seed | 9-25 | — | — | 107 | 98 | 100 | 1.7 | S | 2.0 |
| E1756R | Latham | 9-25 | — | — | 102 | 102 | 99 | 1.7 | Rps1k | 2.0 |
| M-176RR | Mustang | 9-25 | — | — | 102 | 100 | 100 | 1.7 | N | 2.0 |
| PB-1754RR | Sansgaard | 9-25 | — | 103 | 102 | 96 | 98 | 1.7 | S | 2.8 |
| 1720RR | Anderson Seeds | 9-25 | — | — | 101 | 101 | 101 | 1.7 | Rps1k | 2.0 |
| 7173 | Farm Advantage | 9-25 | — | — | 101 | 98 | 101 | 1.7 | Rps1k | 2.3 |
| SX05317 | Dyna-Gro | 9-25 | — | — | 100 | 101 | 100 | 1.7 | Rps1k | 1.8 |
| W2170RR | Wensman | 9-25 | — | — | 99 | 97 | 101 | 1.7 | Rps1k | 1.8 |
| PB-1725RR | PBR | 9-25 | — | — | 98 | 96 | 98 | 1.7 | Rps1k | 2.7 |
| 1776RR | Viking | 9-25 | — | — | 98 | 99 | 102 | 1.7 | S | 1.7 |
| W2163RR | Wensman | 9-26 | — | 105 | 105 | 101 | 99 | 1.6 | N | 2.5 |
| 2163RR | High Cycle | 9-26 | — | — | 99 | 98 | 100 | 1.6 | Rps1k | 1.5 |
| M-205RR | Mustang | 9-26 | — | — | 94 | 99 | 95 | 2.0 | Rps1 | 1.7 |
| DSR-199/RRSTS | Dairyland | 9-27 | — | 102 | 106 | 106 | 92 | 1.9 | Rps1k | 2.0 |
| 191CNR | Anderson Seeds | 9-27 | 103 | 106 | 105 | 97 | 100 | 1.9 | Rps1k | 2.3 |
| RS204NRR | Renk | 9-27 | — | 104 | 105 | 99 | 103 | 2.0 | Rps1k | 2.8 |
| 2420NRR | Gold Country | 9-27 | — | — | 104 | 99 | 102 | 2.0 | Rps1k | 2.3 |
| 2029RR | Viking | 9-27 | — | — | 104 | 100 | 96 | — | Rps1k | 2.5 |
| W2195NRR | Wensman | 9-27 | — | — | 103 | 100 | 100 | 1.9 | Rps1k | 2.0 |
| XR20B31 | Garst Seed | 9-27 | — | — | 102 | 103 | 100 | 2.0 | S | 1.8 |
| ADV1902R | Advantage | 9-27 | — | — | 101 | 102 | 104 | 1.9 | N | 3.3 |
| AG2203 | Asgrow | 9-27 | — | 97 | 98 | 103 | 100 | 2.2 | Rps1k | 2.3 |
| ADV2005R | Advantage | 9-27 | — | — | 97 | 103 | 101 | 2.0 | N | 2.0 |
| MN1803RR | Minn. AES | 9-27 | 91 | 92 | 92 | 98 | 97 | 1.8 | Rps1 | 2.5 |
| SX05123 | Dyna-Gro | 9-28 | — | — | 105 | 101 | 96 | 2.3 | Rps1 | 2.5 |
| 2018RR | Garst Seed | 9-28 | — | — | 105 | 105 | 97 | 2.0 | Rps1k | 3.0 |
| KB206RR | Kaltenberg Seeds | 9-28 | — | — | 104 | 101 | 100 | — | Rps1k | 1.8 |
| K-195+RR/SCN | Kruger | 9-28 | 103 | 104 | 104 | 103 | 95 | 1.9 | Rps1k | 1.8 |
| T-2333RR | Thompson Seeds | 9-28 | — | — | 104 | 102 | 100 | 2.3 | Rps1 | 2.0 |
| AG2205 | Asgrow | 9-28 | — | — | 103 | 103 | 99 | 2.2 | Rps1k | 2.7 |

***Table 9. Performance and characteristics of Roundup Ready soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2003-2005 (continued).***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| RS185RR | Renk | 9-28 | — | — | 101 | 101 | 100 | 1.8 | S | 1.5 |
| DSR-1900/RR | Dairyland | 9-28 | — | — | 98 | 104 | 97 | 1.9 | N | 2.2 |
| 7205 | Farm Advantage | 9-28 | — | — | 98 | 99 | 103 | 2.0 | Rps1 | 2.5 |
| PB-1954RR | PBR | 9-28 | — | 96 | 98 | 100 | 102 | 1.9 | Rps1 | 2.7 |
| ADV1952R | Advantage | 9-28 | — | — | 97 | 102 | 95 | 1.9 | N | 2.3 |
| SOI2169RR | Sands of Iowa | 9-28 | — | 98 | 97 | 97 | 103 | 2.1 | Rps1 | 2.0 |
| K-200RR | Kruger | 9-28 | — | 96 | 94 | 101 | 99 | 2.0 | Rps1 | 2.5 |
| XR19Y52 | Garst Seed | 9-28 | — | — | 93 | 103 | 93 | 1.9 | S | 2.8 |
| 2183RR | High Cycle | 9-29 | — | — | 109 | 102 | 101 | 1.8 | N | 1.8 |
| M-226RR | Mustang | 9-29 | — | — | 109 | 100 | 101 | 2.2 | Rps1 | 3.5 |
| 2111RR | Anderson Seeds | 9-29 | — | — | 108 | 101 | 100 | 2.1 | S | 3.0 |
| K-192RR | KSC/Challenger | 9-29 | — | 102 | 108 | 104 | 98 | 1.9 | S | 2.0 |
| BT7186NR | Ziller | 9-29 | — | — | 108 | 102 | 100 | 1.8 | S | 2.0 |
| KB187RR | Kaltenberg Seeds | 9-29 | — | — | 106 | 102 | 100 | — | S | 2.8 |
| NT-2222RR/SCN | NuTech | 9-29 | — | — | 106 | 102 | 100 | 2.2 | Rps1k | 2.3 |
| 2255RR | Viking | 9-29 | — | — | 106 | 98 | 97 | 2.2 | Rps1 | 2.3 |
| E2045R | Latham | 9-29 | — | — | 105 | 101 | 101 | 2.0 | N | 2.0 |
| PB-2345RR | PBR | 9-29 | — | — | 104 | 99 | 101 | 2.3 | N | 2.2 |
| T-7206RR | Thompson Seeds | 9-29 | — | — | 103 | 100 | 102 | 2.0 | Rps1k | 2.3 |
| PB-2183NRR | Prairie Brand | 9-29 | — | — | 102 | 100 | 103 | 2.0 | Rps1k | 2.7 |
| K-212RR | KSC/Challenger | 9-29 | — | — | 101 | 100 | 102 | 2.1 | N | 2.3 |
| E1935R | Latham | 9-29 | — | — | 101 | 101 | 98 | 1.9 | N | 1.7 |
| K-191RR | KSC/Challenger | 9-29 | — | — | 100 | 103 | 99 | 1.7 | S | 2.2 |
| SOI1863RR | Sands of Iowa | 9-29 | — | — | 100 | 100 | 101 | 1.8 | S | 2.5 |
| W2211RR | Wensman | 9-29 | 99 | 100 | 100 | 101 | 101 | 2.1 | N | 2.8 |
| PB-2243RR | Prairie Brand | 9-30 | 101 | 105 | 110 | 101 | 100 | 2.1 | N | 1.8 |
| 3218RR | Dyna-Gro | 9-30 | 99 | 104 | 108 | 102 | 100 | 2.1 | N | 2.5 |
| PB-2205RR | PBR | 9-30 | — | — | 107 | 103 | 98 | 2.2 | S | 2.7 |
| NT-2112RR/STS | NuTech | 9-30 | — | — | 106 | 99 | 103 | 2.1 | Rps1k | 2.2 |
| RS223RR | Renk | 9-30 | 101 | 103 | 106 | 99 | 98 | 1.5 | N | 2.3 |
| T-7205+RR | Thompson Seeds | 9-30 | — | — | 105 | 99 | 103 | 2.0 | Rps1k | 2.2 |
| 7192 | Farm Advantage | 9-30 | — | 103 | 104 | 98 | 100 | 1.9 | S | 2.5 |
| K-233+RR | KSC/Challenger | 9-30 | 100 | 100 | 104 | 96 | 99 | 2.3 | Rps1k | 1.2 |
| 2224RR | High Cycle | 9-30 | — | — | 103 | 101 | 100 | 2.2 | S | 1.8 |
| SOI2143RR | Sands of Iowa | 9-30 | 101 | 100 | 102 | 100 | 102 | 2.1 | Rps1k | 1.0 |
| SOI2141RR | Sands of Iowa | 9-30 | — | — | 102 | 99 | 101 | 2.1 | S | 2.2 |
| PB-2443RR | Sansgaard | 9-30 | — | — | 101 | 98 | 95 | 2.4 | N | 2.0 |
| K-211+RR | Kruger | 9-30 | 96 | 101 | 100 | 96 | 98 | 2.2 | N | 3.0 |
| AG2403 | Asgrow | 9-30 | 99 | 101 | 97 | 101 | 101 | 2.4 | Rps1k | 1.8 |
| 2223RR | High Cycle | 9-30 | — | — | 97 | 101 | 94 | 2.2 | Rps1k | 2.5 |

***Table 9. Performance and characteristics of Roundup Ready soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2003-2005 (continued).***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil | Maturity Rating | Phytoph-thora Gene | Chlorosis Score |
|---|---|---|---|---|---|---|---|---|---|---|
| AG1903 | Asgrow | 9-30 | — | 96 | 96 | 98 | 97 | 1.9 | Rps1k | 2.5 |
| KB226RR | Kaltenberg Seeds | 9-30 | — | — | 88 | 98 | 100 | — | S | 2.5 |
| 39P22 | Dyna-Gro | 10-1 | — | — | 111 | 97 | 98 | 2.2 | N | 2.0 |
| PB-2385NRR | Sansgaard | 10-1 | — | — | 109 | 101 | 102 | 2.4 | S | 1.8 |
| 92M32 | Pioneer Brand | 10-1 | — | 106 | 108 | 101 | 100 | 2.3 | Rps1k | 2.0 |
| BT7215R | Ziller | 10-1 | — | 105 | 106 | 101 | 102 | 2.1 | Rps1k | 1.5 |
| DSR-234/RR | Dairyland | 10-1 | — | 104 | 105 | 99 | 95 | 2.3 | N | 1.7 |
| 2157RR | Viking | 10-1 | 105 | 106 | 105 | 96 | 105 | 2.1 | Rps1k | 2.8 |
| 6221RR | Gold Country | 10-1 | 99 | 100 | 101 | 101 | 100 | 2.1 | Rps1k | 2.3 |
| 497RR Brand | Latham | 10-1 | 103 | 102 | 100 | 104 | 99 | 2.2 | Rps1k | 1.7 |
| PB-2141RR | Prairie Brand | 10-1 | 97 | 99 | 99 | 102 | 97 | 2.1 | Rps1k | 2.5 |
| ADV2135R | Advantage | 10-1 | 99 | 101 | 96 | 101 | 100 | 2.2 | N | 1.5 |
| KB236RR | Kaltenberg Seeds | 10-2 | — | — | 110 | 102 | 99 | — | S | 2.0 |
| K-223+RR | Kruger | 10-2 | — | — | 109 | 99 | 96 | 2.2 | N | 2.3 |
| PB-2385NRR+ | Sansgaard | 10-2 | — | — | 107 | 101 | 101 | 2.3 | S | 1.7 |
| XR23C90 | Garst Seed | 10-2 | — | — | 96 | 105 | 99 | 2.3 | S | 2.8 |
| BT7236R | Ziller | 10-3 | — | — | 109 | 97 | 98 | 2.3 | Rps1k | 2.5 |
| NT-2324RR/SCN | NuTech | 10-3 | — | — | 107 | 102 | 100 | 2.3 | N | 3.0 |
| M-201RR | Mustang | 10-3 | 103 | 102 | 105 | 99 | 100 | 2.0 | Rps1k | 2.7 |
| Mean | | 9-27 | 54.4 bu/a | 59.1 bu/a | 70.1 bu/a | 34.7% | 19.3% | | | |
| LSD 20% | | | 5% | 6% | 7% | | | | | |

***Table 10. Performance and characteristics of soybean varieties, central zone; at soybean-cyst-nematode infested (Danvers, Hector and Danube) an non-infested (Becker, Morris and Rosemount) sites, 2004-2005.***

| | | | Yield, Percent of Mean | | | | Percent of | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Infested sites | | Non-infested sites | | Mean | | Matu- | Phytoph- | Chlo- | |
| Variety | Brand or Originator | Maturity Date | 2004-2005 | 2005 | 2004-2005 | 2005 | Protein | Oil | rity Rating | thora Gene | rosis Score | SCN Rating |
| MN0902CN | Minn. AES | 9-25 | 92 | 91 | 91 | 94 | 101 | 98 | 0.9 | S | 2.5 | R |
| AG0803 | Asgrow | 9-26 | — | 107 | — | 92 | 97 | 105 | 0.8 | Rps1k | 2.5 | MR |
| 91M12 | Pioneer Brand | 9-26 | — | 98 | — | 95 | 98 | 97 | 1.1 | Rps1c | 2.7 | MR |
| MN1006CN | Minn. AES | 9-26 | 98 | 98 | 102 | 99 | 98 | 104 | 1.0 | Rps1 | 2.0 | R |
| 7084N | Farm Advantage | 9-26 | — | 90 | — | 100 | 100 | 101 | 0.8 | Rps1k | 2.5 | R |
| MN0904RR | Minn. AES | 9-26 | — | 79 | — | 95 | 102 | 96 | 0.9 | Rps1k | 2.0 | S |
| AG0801 | Asgrow | 9-26 | — | 73 | — | 98 | 97 | 99 | 0.8 | S | 2.5 | S |
| Lambert | Minn. AES | 9-26 | 74 | 62 | 97 | 95 | 100 | 103 | 0.7 | Rps1 | 3.2 | S |
| T-0801RR/SCN | Thompson Seeds | 9-27 | — | 94 | — | 97 | 99 | 101 | 0.8 | Rps1k | 1.5 | R |
| PB-0885NRR | Prairie Brand | 9-27 | — | 89 | — | 90 | 100 | 102 | 0.8 | Rps1k | 2.8 | MR |
| SD1091RR | Sodak Genetics | 9-27 | — | 86 | — | 91 | 104 | 99 | 0.9 | Rps1 | 2.3 | S |
| Surge | MN & SD AES | 9-27 | — | 72 | — | 102 | 103 | 98 | 0.9 | Rps1 | 2.3 | S |
| 91M50 | Pioneer Brand | 9-28 | 100 | 106 | 93 | 98 | 100 | 95 | 1.5 | S | 2.3 | R |
| X413R | NK Brand | 9-28 | 105 | 96 | 100 | 94 | 106 | 94 | 1.3 | Rps1c | 2.2 | R |
| AG1501 | Asgrow | 9-29 | 120 | 122 | 106 | 105 | 100 | 104 | 1.5 | Rps1k | 2.8 | MR |
| 151CNR | Anderson Seeds | 9-30 | 122 | 116 | 104 | 96 | 101 | 97 | 1.5 | Rps1k | 3.0 | MR |
| NT-1515RR/SCN | NuTech | 9-30 | — | 113 | — | 95 | 102 | 103 | 1.5 | Rps1k | 2.5 | MR |
| K-141RR/SCN | KSC/Challenger | 9-30 | 114 | 104 | 101 | 96 | 101 | 102 | 1.4 | Rps1k | 2.5 | MR |
| RS124NRR | Renk Seed | 9-30 | — | 103 | — | 98 | 94 | 102 | 1.2 | Rps1c | 1.8 | S |
| Parker | Minn. AES | 9-30 | — | 100 | — | 101 | 100 | 102 | 1.5 | Rps1 | 3.0 | S |
| NT-1514RR/SCN | NuTech | 10-1 | — | 126 | — | 106 | 100 | 102 | 1.5 | S | 3.0 | R |
| T-1727RR/SCN | Thompson Seeds | 10-2 | — | 120 | — | 105 | 104 | 95 | 1.5 | S | 2.3 | R |
| T-1828RR/SCN | Thompson Seeds | 10-2 | — | 118 | — | 119 | 96 | 104 | 1.5 | Rps1k | 2.3 | R |
| PB-1585NRR | Prairie Brand | 10-2 | — | 117 | — | 101 | 100 | 99 | 1.5 | S | 2.7 | R |
| NT-1919RR/SCN | NuTech | 10-3 | — | 115 | — | 109 | 96 | 102 | 1.5 | Rps1k | 2.5 | R |
| PB-1694NRR | Prairie Brand | 10-3 | 108 | 109 | 107 | 109 | 98 | 96 | 1.6 | Rps1c | 2.2 | MR |
| T-1819RR/SCN | Thompson Seeds | 10-4 | — | 118 | — | 108 | 98 | 100 | 1.5 | Rps1k | 2.3 | R |
| PB-1885NRR | Prairie Brand | 10-5 | — | 130 | — | 110 | 100 | 102 | 1.7 | N | 2.3 | R |
| NT-1888RR/SCN | NuTech | 10-5 | — | 122 | — | 112 | 99 | 100 | 1.5 | S | 2.3 | S |
| Mean | | 9-29 | 39.8 bu/a | 52.0 bu/a | 52.8 bu/a | 67.8 bu/a | 36.4% | 18.6% | | | | |
| LSD 20% | | | 7% | 8% | 8% | 9% | | | | | | |

***Table 11. Performance and characteristics of soybean varieties, southern zone; at soybean-cyst nematode-infested (Hayward, Lamberton, Madelia and Waseca) and non-infested (Jackson, Lamberton, and Waseca) sites, 2003-2005.***

| Variety | Brand or Originator | Maturity Date | Yield, Percent of Mean: Infested sites 2003-2005 | Infested sites 2004-2005 | Infested sites 2005 | Non-infested sites 2003-2005 | Non-infested sites 2004-2005 | Non-infested sites 2005 | Percent of Mean: Protein | Percent of Mean: Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score | SCN Rating |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MN1006CN | Minn. AES | 9-20 | 85 | 85 | 83 | 90 | 88 | 86 | 96 | 104 | 1.0 | Rps1 | 1.5 | R |
| MN1302 | Minn. AES | 9-21 | — | — | 83 | — | — | 88 | 97 | 100 | 1.3 | Rps1k | 2.5 | S |
| K-141RR/SCN | KSC/Challenger | 9-22 | — | 100 | 97 | — | 95 | 93 | 103 | 99 | 1.4 | Rps1k | 2.0 | R |
| 151CNR | Anderson Seeds | 9-22 | — | 96 | 93 | — | 91 | 87 | 104 | 98 | 1.5 | Rps1k | 2.0 | R |
| X413R | NK Brand | 9-22 | — | — | 84 | — | — | 86 | 104 | 99 | 1.3 | Rps1c | 2.5 | R |
| Freeborn | Minn. AES | 9-22 | 88 | 81 | 81 | 85 | 82 | 81 | 106 | 98 | 1.6 | Rps1 | 2.5 | R |
| 91M91 | Pioneer Brand | 9-23 | — | — | 102 | — | — | 101 | 96 | 100 | 1.9 | Rps1k | 3.0 | R |
| E1783R | Latham | 9-23 | — | — | 100 | — | — | 100 | 99 | 102 | 1.7 | Rps1c | 2.0 | R |
| SOI1867NRR | Sands of Iowa | 9-23 | — | — | 99 | — | — | 95 | 97 | 100 | 1.8 | Rps1c | 2.0 | R |
| 1768CNRR | Viking | 9-23 | — | — | 96 | — | — | 89 | 101 | 100 | 1.7 | S | 2.0 | R |
| X417R | NK Brand | 9-23 | — | 92 | 93 | — | 96 | 94 | 99 | 97 | 1.7 | Rps1 | 2.5 | R |
| Parker | Minn. AES | 9-23 | 78 | 73 | 70 | 91 | 90 | 90 | 99 | 100 | 1.5 | Rps1 | 3.0 | S |
| S18-N5 | NK Brand | 9-24 | — | — | 108 | — | — | 98 | 101 | 97 | 1.8 | S | 2.5 | R |
| PB-1585NRR | Prairie Brand | 9-24 | — | — | 102 | — | — | 97 | 101 | 100 | 1.5 | S | 2.5 | R |
| T-1727RR/SCN | Thompson Seeds | 9-24 | — | — | 98 | — | — | 95 | 101 | 100 | 1.5 | S | 1.0 | R |
| M-166NRR | Mustang | 9-24 | — | — | 94 | — | — | 101 | 102 | 100 | 1.6 | S | 2.8 | R |
| XR18N15 | Garst Seed | 9-25 | — | — | 98 | — | — | 101 | 99 | 101 | 1.8 | Rps1c | 2.0 | R |
| K-166RR/SCN | Kruger | 9-25 | — | — | 97 | — | — | 94 | 102 | 99 | 1.6 | S | 2.0 | R |
| 2174RR | High Cycle | 9-25 | — | 93 | 89 | — | 102 | 103 | 100 | 100 | 1.7 | Rps1c | 1.5 | R |
| MN1801 | Minn. AES | 9-25 | — | — | 83 | — | — | 97 | 101 | 101 | 1.8 | Rps1c | 2.5 | S |
| Sturdy | Minn. AES | 9-25 | — | — | 74 | — | — | 94 | 99 | 101 | 2.0 | Rps1 | 2.3 | S |
| X519R | NK Brand | 9-26 | — | — | 111 | — | — | 103 | 100 | 98 | 1.9 | S | 2.5 | R |
| K-188RR/SCN | Kruger | 9-26 | — | — | 110 | — | — | 99 | 97 | 101 | 1.8 | S | 2.5 | R |
| T-1819RR/SCN | Thompson Seeds | 9-26 | — | — | 94 | — | — | 105 | 99 | 100 | 1.5 | Rps1k | 2.0 | R |
| T-7193RR/SCN | Thompson Seeds | 9-27 | — | 109 | 115 | — | 105 | 101 | 98 | 104 | 1.9 | Rps1k | 1.8 | R |
| K-195+RR/SCN | Kruger | 9-27 | 109 | 114 | 114 | 110 | 111 | 109 | 99 | 103 | 1.9 | Rps1k | 2.0 | R |
| RS204NRR | Renk Seed | 9-27 | — | — | 110 | — | — | 108 | 99 | 103 | 2.0 | Rps1k | 2.0 | R |
| NT-1919RR/SCN | NuTech | 9-27 | — | 109 | 109 | — | 104 | 103 | 98 | 104 | 1.9 | Rps1k | 2.0 | R |
| NT-2122RR/SCN | NuTech | 9-27 | — | — | 108 | — | — | 101 | 98 | 102 | 2.1 | S | 2.8 | R |
| 1908CNRR | Viking | 9-27 | 103 | 106 | 106 | 105 | 104 | 100 | 100 | 100 | 1.9 | Rps1k | 2.0 | R |
| 191CNR | Anderson Seeds | 9-27 | 103 | 106 | 105 | 103 | 105 | 103 | 98 | 103 | 1.9 | Rps1k | 3.0 | R |
| PB-1885NRR | Prairie Brand | 9-27 | — | — | 103 | — | — | 100 | 98 | 102 | 1.7 | N | 2.8 | R |
| 19G01 | Galena Genetics | 9-27 | — | — | 87 | — | — | 96 | 101 | 97 | 1.9 | S | 3.0 | R |
| PB-2183NRR | Prairie Brand | 9-28 | 110 | 112 | 117 | 106 | 108 | 106 | 99 | 103 | 2.0 | Rps1k | 2.0 | R |
| M-194NRR | Mustang | 9-28 | 115 | 116 | 116 | 111 | 112 | 113 | 96 | 102 | 1.9 | Rps1k | 2.0 | R |
| 92M30 | Pioneer Brand | 9-28 | — | — | 114 | — | — | 92 | 100 | 99 | 2.3 | S | 2.3 | R |
| AG2107 | Asgrow | 9-28 | 112 | 112 | 106 | 105 | 106 | 105 | 100 | 104 | 2.1 | Rps1k | 3.0 | R |
| SOI2151NRR | Sands of Iowa | 9-28 | 102 | 103 | 105 | 106 | 104 | 102 | 97 | 103 | 2.1 | Rps1k | 2.3 | R |
| AG2203 | Asgrow | 9-28 | — | 105 | 101 | — | 98 | 98 | 101 | 96 | 2.2 | Rps1k | 2.5 | R |
| IA1068 | Iowa AES | 9-28 | 96 | 91 | 92 | 96 | 95 | 93 | 102 | 98 | 2.0 | S | 2.5 | R |

***Table 11. Performance and characteristics of soybean varieties, southern zone; at soybean-cyst nematode-infested (Hayward, Lamberton, Madelia and Waseca) and non-infested (Jackson, Lamberton, and Waseca) sites, 2003-2005 (continued).***

| | | | Yield, Percent of Mean | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Infested sites | | | Non-infested sites | | | Percent of Mean | | | | | |
| Variety | Brand or Originator | Maturity Date | 2003-2005 | 2004-2005 | 2005 | 2003-2005 | 2004-2005 | 2005 | Protein | Oil | Maturity Rating | Phytophthora Gene | Chlorosis Score | SCN Rating |
| NT-2222RR/SCN | NuTech | 9-29 | — | — | 120 | — | — | 107 | 98 | 102 | 2.2 | Rps1k | 2.3 | R |
| 33X19 | Dyna-Gro | 9-29 | 107 | 107 | 103 | — | 109 | 106 | 98 | 104 | 1.9 | Rps1k | 1.8 | R |
| IA2050 | Iowa AES | 9-29 | — | — | 92 | — | — | 100 | 100 | 99 | 2.1 | S | 2.8 | S |
| K-213RR/SCN | KSC/Challenger | 9-30 | — | — | 104 | — | — | 107 | 100 | 99 | 2.2 | S | 2.5 | S |
| IA2068 | Iowa AES | 10-1 | — | 106 | 101 | — | 103 | 101 | 97 | 101 | 2.2 | S | 2.5 | R |
| E2183R | Latham | 10-1 | — | — | 91 | — | — | 109 | 102 | 98 | 2.1 | S | 2.0 | MR |
| Turner | S.D. AES | 10-2 | — | 98 | 95 | — | 99 | 98 | 100 | 100 | 2.2 | S | 2.8 | R |
| K-2320SCN | KSC/Challenger | 10-3 | — | 106 | 108 | — | 111 | 116 | 99 | 100 | 2.3 | S | 1.5 | R |
| K-236RR/SCN | KSC/Challenger | 10-3 | — | — | 103 | — | — | 107 | 103 | 96 | 2.3 | S | 2.0 | R |
| 92B38 | Pioneer | 10-3 | — | — | 92 | — | — | 100 | 100 | 97 | 2.3 | S | 2.5 | MR |
| K-235RR/SCN | Kruger | 10-4 | — | — | 116 | — | — | 103 | 101 | 102 | 2.3 | N | 2.0 | R |
| NT-2324RR/SCN | NuTech | 10-4 | — | — | 114 | — | — | 107 | 101 | 98 | 2.3 | N | 2.3 | R |
| 92M40 | Pioneer Brand | 10-4 | — | — | 107 | — | — | 104 | 102 | 98 | 2.4 | Rps1c | 2.8 | MR |
| PB-2385NRR | Prairie Brand | 10-4 | — | — | 106 | — | — | 104 | 105 | 96 | 2.3 | S | 3.0 | R |
| SX04324 | Dyna-Gro | 10-4 | — | — | 105 | — | — | 104 | 103 | 95 | 2.4 | Rps1k | 3.0 | R |
| T-2424RR/SCN | Thompson Seeds | 10-4 | — | — | 103 | — | — | 104 | 103 | 96 | 2.4 | S | 1.0 | R |
| SOI2467NRR | Sands of Iowa | 10-5 | — | — | 116 | — | — | 105 | 101 | 100 | 2.4 | N | 2.0 | MR |
| E2422RX | Latham | 10-5 | — | — | 103 | — | — | 105 | 103 | 95 | 2.4 | S | 2.8 | R |
| Mean | | 9-27 | 42.3 bu/a | 46.1 bu/a | 50.6 bu/a | 52.5 bu/a | 58.3 bu/a | 69.7 bu/a | 35.5% | 19.3% | | | | |
| LSD 20% | | | 6% | 7% | 9% | 5% | 6% | 7% | | | | | | |

***Table 12. Characteristics of special use soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2005.***

| Variety | Releasing Institution | Maturity Rating | Special Characteristics | Hilum Color | Phytophthora Gene | Chlorosis Score | Seeds/Lb. |
|---|---|---|---|---|---|---|---|
| Jim | N.D. AES | 00.8 | General Purpose | Yellow | S | 1.7 | 3,047 |
| Atwood | Earthwise | 00.8 | Food Type | Yellow | S | 1.7 | 2,987 |
| Colibri | Earthwise | 00.3 | Food Type | Brown | N | 2.2 | 6,676 |
| Traill | N.D. AES | 0.0 | General Purpose | Yellow | Rps1 | 1.3 | 2,987 |
| UM3 | Minn. AES | 00.9 | Small Seed | Yellow | Rps1 | 1.0 | 7,206 |
| MN0203SP | Minn. AES | 0.2 | Small Seed | Yellow | Rps1 | 1.5 | 5,896 |
| Nannonatto | N.D. AES | 0.3 | Small Seed | Yellow | S | 1.5 | 4,451 |
| MN0201 | Minn. AES | 0.2 | General Purpose | Yellow | Rps1 | 1.7 | 3,290 |
| Norpro | N.D. AES | 0.4 | Higher Protein | Yellow | S | 1.8 | 2,752 |
| MK0205 | Richland Organics | 0.2 | Small Seed | Yellow | N | 1.3 | 5,405 |
| MN0303SP | Minn. AES | 0.3 | Small Seed | Yellow | Rps1 | 1.5 | 5,821 |
| MN0205SP | Minn. AES | 0.2 | Small Seed | Yellow | Rps1 | 1.3 | 5,537 |
| MN0202SP | Minn. AES | 0.2 | Small Seed | Yellow | Rps1 | 1.7 | 5,537 |
| MK0953 | Richland Organics | 0.3 | Tofu | Yellow | S | 1.3 | 1,965 |
| Panther | Earthwise | 0.5 | Food Type | Yellow | S | 1.3 | 1,991 |
| Danatto | N.D. AES | 0.4 | Small Seed | Yellow | S | 2.2 | 5,101 |

***Table 13. Performance of special-use soybean varieties, northern zone; Crookston, Moorhead and Shelly, 2003-2005.***

| Variety | Releasing Institution | Maturity Date | Yield, Percent of Mean 2003-2005 | 2004-2005 | 2005 | Percent of Mean Protein | Oil |
|---|---|---|---|---|---|---|---|
| Jim | N.D. AES | 9-13 | 110 | 111 | 117 | 97 | 101 |
| Atwood | Earthwise | 9-16 | — | — | 108 | 100 | 103 |
| Colibri | Earthwise | 9-16 | — | — | 101 | 95 | 97 |
| Traill | N.D. AES | 9-17 | 117 | 112 | 121 | 102 | 100 |
| UM3 | Minn. AES | 9-18 | 92 | 92 | 91 | 99 | 99 |
| MN0203SP | Minn. AES | 9-18 | 91 | 86 | 90 | 106 | 97 |
| Nannonatto | N.D. AES | 9-19 | 104 | 105 | 111 | 94 | 102 |
| MN0201 | Minn. AES | 9-20 | 117 | 120 | 117 | 107 | 100 |
| Norpro | N.D. AES | 9-20 | 104 | 99 | 99 | 107 | 95 |
| MK0205 | Richland Organics | 9-21 | — | 104 | 108 | 98 | 103 |
| MN0303SP | Minn. AES | 9-21 | 99 | 96 | 102 | 100 | 100 |
| MN0205SP | Minn. AES | 9-21 | 101 | 97 | 99 | 98 | 99 |
| MN0202SP | Minn. AES | 9-21 | 98 | 95 | 98 | 96 | 98 |
| MK0953 | Richland Organics | 9-24 | 99 | 94 | 95 | 100 | 99 |
| Panther | Earthwise | 9-25 | — | — | 95 | 106 | 99 |
| Danatto | N.D. AES | 9-25 | 87 | 71 | 52 | 94 | 105 |
| Mean | | 9-20 | 28.6 bu/a | 28.2 bu/a | 35.6 bu/a | 35.1% | 17.9% |
| LSD 20% | | | 8% | 9% | 9% | | |

***Table 14. Characteristics of special use soybean varieties, central zone; Becker, Morris and Rosemount, 2005.***

| Variety | Releasing Institution | Maturity Rating | Special Characteristics | Hilum Color | Phytophthora Gene | Chlorosis Score | Seeds/Lb. |
|---|---|---|---|---|---|---|---|
| MN0302 | Minn. AES | 0.3 | General Purpose | Buff | Rps1k | 1.3 | 3,007 |
| MN0201 | Minn. AES | 0.2 | General Purpose | Yellow | Rps1 | 2.3 | 3,197 |
| Minnpro | Northland Organic Foods | 0.8 | Higher Protein | Yellow | S | 1.8 | 2,671 |
| MN0803SP | Minn. AES | 0.8 | Smaller Seed Higher Protein | Yellow | Rps1 | 2.0 | 4,633 |
| Proto | Minn. AES | 0.5 | Higher Protein | Buff | S | 1.7 | 3,047 |
| Toyopro | Northland Organic Foods | 0.8 | Higher Protein | Yellow | S | 2.3 | 3,110 |
| Minnatto | Minn. AES | 0.9 | Small Seed | Yellow | Rps1 | 1.8 | 5,279 |
| Evans | Minn. AES | 0.5 | Yellow Hilum | Yellow | Rps1 | 1.8 | 2,802 |
| Panther | Earthwise | 0.5 | Food Type | Yellow | S | 1.8 | 1,957 |
| MN1004SP | Minn. AES | 1.0 | Low Sat., Low Linolenic Acid | Black | Rps1 | 2.3 | 3,088 |
| MN1103SP | Minn. AES | 1.1 | Low Linolenic Acid | Black | Rps1 | 1.5 | 2,752 |
| Surge | Minn. AES | 0.9 | General Purpose | Imperfect Black | Rps1 | 2.3 | 2,467 |
| MN1102SP | Minn. AES | 1.1 | Large Seed, Higher Protein | Yellow | S | 1.5 | 2,551 |
| Altapro | Northland Organic Foods | 1.0 | Higher Protein | Yellow | S | 2.0 | 3,519 |
| Danatto | Minn. AES | 0.4 | Small Seed | Yellow | S | 2.3 | 5,101 |
| Kato | Minn. AES | 1.3 | Higher Protein | Black | Rps1 | 1.8 | 2,215 |
| MN0601SP | Minn. AES | 0.6 | Higher Protein | Yellow | Rps1c | 2.2 | 4,054 |
| MN1302 | Minn. AES | 1.3 | General Purpose | Buff | Rps1k | 2.2 | 2,467 |
| MN1005 | Minn. AES | 1.0 | General Purpose | Buff | S | 1.8 | 3,266 |
| Lambert | Minn. AES | 0.7 | General Purpose | Buff | Rps1 | 2.5 | 3,027 |
| Minori | Earthwise | 1.4 | Food Type | Brown | Rps1k | 2.0 | 2,655 |
| MN1101SP | Minn. AES | 1.1 | Large Seed, Higher Protein | Yellow | Rps1 | 1.8 | 2,389 |
| MK9532 | Richland Organics | 0.9 | Natto | Yellow | S | 1.5 | 4,408 |
| MN1007SP | Minn. AES | 1.0 | Small Seed | Yellow | Rps1 | 1.7 | 5,974 |
| IF44 | Earthwise | 1.4 | Food Type | Yellow | S | 1.5 | 2,236 |
| MN1306SP | Minn. AES | 1.3 | Small Seed | Yellow | Rps1 | 2.8 | 6,985 |
| MN0903SP | Minn. AES | 0.9 | Higher Protein | Yellow | Rps1 | 2.3 | 2,855 |
| MN1302 | Minn. AES | 1.3 | General Purpose | Buff | Rps1k | 1.8 | 2,495 |
| MN1201SP | Minn. AES | 1.2 | Large Seed, Higher Protein | Yellow | Rps1 | 1.5 | 2,281 |
| Parker | Minn. AES | 1.5 | General Purpose | Buff | Rps1 | 2.0 | 2,671 |
| MN1503SP | Minn. AES | 1.5 | Large Seed, Higher Protein | Yellow | Rps1 | 2.3 | 2,481 |

***Table 15. Performance of special-use soybean varieties, central zone; Becker, Morris and Rosemount, 2003-2005.***

| Variety | Releasing Institution | Maturity Date | Yield, Percent of Mean | | | Percent of Mean | |
|---|---|---|---|---|---|---|---|
| | | | 2003-2005 | 2004-2005 | 2005 | Protein | Oil |
| MN0302 | Minn. AES | 9-10 | 110 | 108 | 107 | 94 | 108 |
| MN0201 | Minn. AES | 9-10 | 98 | 97 | 100 | 98 | 106 |
| Minnpro | Northland Organic Foods | 9-11 | 97 | 95 | 93 | 108 | 93 |
| Proto | Minn. AES | 9-11 | 86 | 82 | 79 | 101 | 97 |
| Panther | Earthwise | 9-12 | — | — | 98 | 100 | 104 |
| MN0803SP | Minn. AES | 9-12 | 83 | 82 | 87 | 109 | 92 |
| Minnatto | Minn. AES | 9-12 | 82 | 83 | 83 | 97 | 98 |
| Evans | Minn. AES | 9-14 | 111 | 105 | 110 | 91 | 106 |
| MN1004SP | Minn. AES | 9-14 | 89 | 87 | 87 | 102 | 100 |
| Danatto | Minn. AES | 9-14 | 60 | 59 | 49 | 91 | 105 |
| MN1103SP | Minn. AES | 9-15 | 112 | 107 | 106 | 98 | 103 |
| Toyopro | Northland Organic Foods | 9-15 | 99 | 97 | 95 | 109 | 93 |
| Surge | Minn. AES | 9-16 | 115 | 110 | 105 | 98 | 105 |
| MK9532 | Richland Organics | 9-16 | — | — | 96 | 94 | 108 |
| MN1102SP | Minn. AES | 9-16 | 111 | 106 | 95 | 101 | 100 |
| Altapro | Northland Organic Foods | 9-16 | 92 | 91 | 92 | 116 | 86 |
| MN0601SP | Minn. AES | 9-16 | 88 | 87 | 80 | 110 | 90 |
| Lambert | Minn. AES | 9-17 | 116 | 116 | 122 | 94 | 108 |
| Kato | Minn. AES | 9-17 | 105 | 105 | 106 | 103 | 99 |
| MN1302 | Minn. AES | 9-18 | — | 129 | 127 | 90 | 105 |
| MN1005 | Minn. AES | 9-18 | — | — | 125 | 92 | 105 |
| Minori | Earthwise | 9-18 | — | — | 116 | 99 | 103 |
| MN1101SP | Minn. AES | 9-18 | 112 | 106 | 101 | 109 | 93 |
| MN1007SP | Minn. AES | 9-18 | 82 | 84 | 84 | 103 | 90 |
| IF44 | Earthwise | 9-19 | — | — | 103 | 103 | 99 |
| MN1306SP | Minn. AES | 9-19 | 92 | 97 | 99 | 97 | 98 |
| MN0903SP | Minn. AES | 9-19 | 107 | 103 | 91 | 104 | 96 |
| MN1302 | Minn. AES | 9-20 | 130 | 129 | 126 | 92 | 106 |
| MN1201SP | Minn. AES | 9-20 | 109 | 106 | 104 | 100 | 101 |
| Parker | Minn. AES | 9-21 | 114 | 113 | 123 | 93 | 106 |
| MN1503SP | Minn. AES | 9-22 | — | 116 | 111 | 103 | 92 |
| Mean | | 9-16 | 40.4 bu/a | 44.2 bu/a | 55.2 bu/a | 37.5% | 18.3% |
| LSD 20% | | | 6% | 7% | 7% | | |

***Table 16. Characteristics of special use soybean varieties, southern zone; Waseca, Lamberton and Jackson, 2005.***

| Variety | Releasing Institution | Maturity Rating | Special Characteristics | Hilum Color | Phytoph-thora Gene | Chlorosis Score | Seeds/ Lb. |
|---|---|---|---|---|---|---|---|
| MN1004SP | Minn. AES | 1.0 | Low Saturated Fatty Acid | Black | Rps1 | 3.0 | 3,007 |
| MN1101SP | Minn. AES | 1.1 | Large Seed, Higher Protein | Yellow | Rps1 | 2.7 | 2,142 |
| Surge | Minn. & S.D AES | 0.9 | General Purpose | Imperfect Black | Rps1 | 3.5 | 2,481 |
| 0.X1452 | Viking | 1.4 | Large Seed, Higher Protein | Yellow | S | 1.8 | 2,152 |
| MN1404SP | Minn. AES | 1.4 | Large Seed, Higher Protein | Yellow | Rps1 | 2.5 | 2,054 |
| MN1302 | Minn. AES | 1.3 | General Purpose | Buff | Rps1k | 2.7 | 2,454 |
| 0909 | Bluestem Farm Supply | 0.9 | Large Seed | Yellow | S | 4.0 | 2,536 |
| Parker | Minn. AES | 1.5 | General Purpose | Buff | Rps1 | 2.5 | 2,428 |
| MN1305SP | Minn. AES | 1.3 | Large Seed, Higher Protein | Yellow | Rps1 | 1.3 | 2,121 |
| MN1604SP | Minn. AES | 1.6 | Small Seed | Yellow | Rps1 | 3.5 | 6,306 |
| MN1501SP | Minn. AES | 1.5 | Small Seed | Buff | S | 2.3 | 4,989 |
| MN1502SP | Minn. AES | 1.5 | Large Seed, Higher Protein | Yellow | Rps1 | 2.0 | 2,281 |
| MN1607SP | Minn. AES | 1.6 | Large Seed, Higher Protein | Yellow | Rps1 | 3.3 | 2,183 |
| MN1403SP | Minn. AES | 1.4 | Large Seed | Yellow | Rps1 | 2.5 | 2,236 |
| MN1503SP | Minn. AES | 1.5 | Large Seed, Higher Protein | Yellow | Rps1 | 4.5 | 2,236 |
| Royalpro | Northland Organic Foods | 1.6 | Large Seed, Higher Protein | Yellow | S | 3.0 | 1,884 |
| MN1606SP | Minn. AES | 1.6 | Large Seed, Higher Protein | Yellow | Rps1 | 2.8 | 2,162 |
| MN1607SP | Minn. AES | 1.6 | Large Seed, Higher Protein | Yellow | Rps1 | 2.3 | 2,152 |
| Soyapro | Northland Organic Foods | 1.6 | Large Seed, Higher Protein | Yellow | S | 2.0 | 1,940 |
| 0.2022 | Viking | 2.0 | Large Seed | Yellow | Rps1c | 2.3 | 2,508 |
| IA2071 | Iowa AES | 1.6 | Fatty Acid | Imperfect Black | S | 2.5 | 2,259 |
| IA2069 | Iowa AES | 1.7 | Fatty Acid | Black | S | 3.8 | 2,428 |
| MN1605SP | Minn. AES | 1.6 | Small Seed | Yellow | Rps1 | 2.5 | 6,219 |
| 0.1832 | Viking | 1.8 | Feed | Buff | Rps1 | 3.5 | 2,624 |
| IA1008 | Iowa AES | 2.0 | Yellow Hilum | Yellow | S | 1.5 | 2,522 |
| IA1007 | Iowa AES | 1.8 | Large Seed, Higher Protein | Yellow | S | 2.5 | 1,876 |
| MN2001SP | Minn. AES | 2.0 | Large Seed, Higher Protein | Yellow | Rps1 | 1.0 | 2,083 |
| IA2070 | Iowa AES | 2.0 | Fatty Acid | Black | S | 2.8 | 2,686 |
| Surepro | Northland Organic Foods | 1.9 | Large Seed, Higher Protein | Yellow | S | 2.0 | 2,027 |
| IA2050 | Iowa AES | 1.7 | General Purpose | Black | S | 2.3 | 2,719 |
| IA1010 | Iowa AES | 1.9 | Large Seed | Yellow | S | 2.7 | 1,529 |
| MN2101SP | Minn. AES | 2.1 | Large Seed, Higher Protein | Brown | Rps1 | 3.5 | 1,823 |
| 25G01 | Galena Genetics | 2.5 | Large Seed | Yellow | S | 3.3 | 2,215 |
| 7321 | Pattison Bros. | 2.1 | Tofu Type | Yellow | S | 2.5 | 1,940 |
| HP204 | Iowa AES | 2.0 | Large Seed, Higher Protein | Yellow | S | 2.5 | 2,073 |
| Vinton 81 | Iowa AES | 2.0 | Large Seed, Higher Protein | Yellow | Rps1c | 2.8 | 1,983 |
| 7588 | Pattison Bros. | 2.2 | Tofu Type | Yellow | S | 2.3 | 2,441 |
| IA2053 | Iowa AES | 2.5 | Large Seed, Higher Protein | Yellow | S | 2.0 | 1,854 |
| 2300 | Bluestem Farm Supply | 2.3 | Large Seed, Higher Protein | Yellow | S | 2.0 | 1,900 |
| IA2067 | Iowa AES | 2.4 | Large Seed, Higher Protein | Yellow | S | 2.7 | 1,846 |
| IA2016 | Iowa AES | 2.2 | Large Seed, Higher Protein | Yellow | S | 3.0 | 2,009 |
| IA1013 | Iowa AES | 2.1 | Large Seed, Higher Protein | Yellow | S | 2.7 | 1,823 |

***Table 17. Performance of special-use soybean varieties, southern zone; Jackson, Lamberton and Waseca, 2003-2005.***

| Variety | Releasing Institution | Maturity Date | Yield, Percent of Mean | | | Percent of Mean | |
|---|---|---|---|---|---|---|---|
| | | | 2003-2005 | 2004-2005 | 2005 | Protein | Oil |
| MN1004SP | Minn. AES | 9-14 | 86 | 82 | 75 | 103 | 96 |
| MN1101SP | Minn. AES | 9-16 | 99 | 96 | 90 | 104 | 100 |
| Surge | Minn. & S.D AES | 9-17 | — | 105 | 99 | 97 | 105 |
| 0.X1452 | Viking | 9-17 | — | 97 | 93 | 104 | 100 |
| MN1404SP | Minn. AES | 9-19 | 93 | 92 | 93 | 103 | 100 |
| MN1302 | Minn. AES | 9-20 | 118 | 113 | 113 | 92 | 107 |
| 0909 | Bluestem Farm Supply | 9-20 | — | — | 98 | 93 | 107 |
| Parker | Minn. AES | 9-20 | 117 | 102 | 95 | 94 | 107 |
| MN1305SP | Minn. AES | 9-20 | 93 | 89 | 87 | 97 | 102 |
| MN1604SP | Minn. AES | 9-20 | 86 | 84 | 86 | 97 | 95 |
| MN1501SP | Minn. AES | 9-21 | 81 | 77 | 79 | 103 | 88 |
| MN1502SP | Minn. AES | 9-22 | 99 | 94 | 93 | 99 | 103 |
| MN1607SP | Minn. AES | 9-23 | 116 | 110 | 103 | 103 | 100 |
| MN1403SP | Minn. AES | 9-23 | 111 | 106 | 100 | 97 | 104 |
| MN1503SP | Minn. AES | 9-23 | 108 | 103 | 99 | 102 | 101 |
| Royalpro | Northland Organic Foods | 9-23 | 102 | 99 | 98 | 105 | 99 |
| MN1606SP | Minn. AES | 9-24 | 114 | 111 | 106 | 102 | 100 |
| MN1607SP | Minn. AES | 9-24 | — | — | 106 | 101 | 99 |
| Soyapro | Northland Organic Foods | 9-24 | 100 | 97 | 90 | 106 | 98 |
| 0.2022 | Viking | 9-25 | — | 110 | 118 | 94 | 107 |
| IA2071 | Iowa AES | 9-25 | — | — | 108 | 93 | 102 |
| IA2069 | Iowa AES | 9-26 | — | — | 111 | 95 | 100 |
| MN1605SP | Minn. AES | 9-26 | 92 | 90 | 96 | 98 | 95 |
| 0.1832 | Viking | 9-27 | — | 121 | 123 | 93 | 107 |
| IA1008 | Iowa AES | 9-27 | — | 105 | 105 | 94 | 104 |
| IA1007 | Iowa AES | 9-27 | 97 | 96 | 93 | 99 | 99 |
| MN2001SP | Minn. AES | 9-27 | 108 | 96 | 92 | 106 | 99 |
| IA2070 | Iowa AES | 9-28 | — | — | 121 | 100 | 97 |
| Surepro | Northland Organic Foods | 9-28 | — | 112 | 106 | 109 | 97 |
| IA2050 | Iowa AES | 9-28 | 129 | 109 | 103 | 95 | 106 |
| IA1010 | Iowa AES | 9-29 | — | 108 | 101 | 100 | 95 |
| MN2101SP | Minn. AES | 9-29 | 112 | 92 | 85 | 100 | 100 |
| 25G01 | Galena Genetics | 9-30 | — | — | 105 | 95 | 106 |
| 7321 | Pattison Bros. | 9-30 | — | 104 | 104 | 108 | 96 |
| HP204 | Iowa AES | 9-30 | 92 | 94 | 89 | 102 | 99 |
| Vinton 81 | Iowa AES | 9-30 | 92 | 82 | 79 | 103 | 98 |
| 7588 | Pattison Bros. | 10-1 | — | — | 126 | 99 | 103 |
| IA2053 | Iowa AES | 10-1 | — | 118 | 118 | 104 | 95 |
| 2300 | Bluestem Farm Supply | 10-1 | — | — | 110 | 103 | 101 |
| IA2067 | Iowa AES | 10-1 | — | 105 | 104 | 106 | 93 |
| IA2016 | Iowa AES | 10-1 | 99 | 101 | 104 | 102 | 95 |
| IA1013 | Iowa AES | 10-1 | — | 100 | 96 | 107 | 96 |
| Mean | | 9-25 | 40.1 bu/a | 45.3 bu/a | 52.4 bu/a | 37.6% | 18.6% |
| LSD 20% | | | 4% | 6% | 7% | | |

***Table 18. Characteristics of publicly developed soybean varieties entered in 2005 tests.***

| Variety | Releasing Institution | Maturity Rating | Phytophthora Gene | BSR Reaction | SCN Reaction | Chlorosis Score |
|---|---|---|---|---|---|---|
| MN0071 | Minn. AES | 00.7 | Rps1 | S | S | 2.2 |
| Glacier | Minn. AES | 00.8 | Rps6 | S | S | 2.7 |
| Jim | N.D. AES | 00.8 | S | S | S | 2.8 |
| MN0091 | Minn. AES | 00.9 | Rps6 | — | S | 2.3 |
| Traill | N.D. AES | 0.0 | Rs1 | S | S | 2.5 |
| MN0101 | Minn. AES | 0.1 | Rps1 | — | S | 2.5 |
| Barnes | N.D. AES | 0.2 | Rps6 | S | S | 3.0 |
| MN0201 | Minn. AES | 0.2 | Rps1 | R | S | 2.3 |
| Walsh | N.D. AES | 0.2 | Rps6 | S | S | 2.5 |
| MN0302 | Minn. AES | 0.3 | Rps1k | S | S | 2.2 |
| MN0304 | Minn. AES | 0.3 | Rps1k+Rps6 | R | S | 2.5 |
| Lambert | Minn. AES | 0.7 | Rps1 | S | S | 3.0 |
| MN0902CN | Minn. AES | 0.9 | Rps1 | R | R | 2.6 |
| Surge | Minn.& S.D. AES | 0.9 | Rps1 | S | S | 2.9 |
| MN0904RR | Minn. AES | 0.9 | Rps1k | — | S | 2.5 |
| MN1005 | Minn. AES | 1.0 | Rps1k | S | S | 2.5 |
| MN1006CN | Minn. AES | 1.0 | Rps1 | S | R | 2.5 |
| Kato | Minn. AES | 1.3 | Rps1 | S | S | 2.5 |
| MN1302 | Minn. AES | 1.3 | Rps1k | R | S | 2.5 |
| MN1504RR | Minn. AES | 1.4 | Rps1k | — | S | 2.0 |
| Parker | Minn. AES | 1.5 | Rps1 | S | S | 2.6 |
| Freeborn | Minn. AES | 1.6 | Rps1 | R | R | 2.6 |
| IA1006 | Iowa AES | 1.6 | S | R | S | 3.0 |
| MN1801 | Minn. AES | 1.8 | Rps1c | S | S | 2.8 |
| MN1803RR | Minn. AES | 1.8 | Rps1 | — | S | 2.6 |
| IA1008 | Iowa AES | 2.0 | S | S | R | 2.5 |
| Sturdy | Minn. AES | 2.0 | Rps1 | S | S | 2.4 |
| IA2068 | Iowa AES | 2.1 | S | S | R | 2.5 |
| IA2008R | Iowa AES | 2.1 | Rps1k | R | S | 2.7 |
| IA2050 | Iowa AES | 2.1 | S | S | S | 2.8 |
| IA2065 | Iowa AES | 2.2 | — | — | S | 2.6 |
| Turner | S.D. AES | 2.3 | S | S | R | 2.8 |

## *Planting Rate and Date*

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

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

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

# MINNESOTA VARIETAL TRIALS RESULTS

Agricultural Experiment Station

University of Minnesota

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