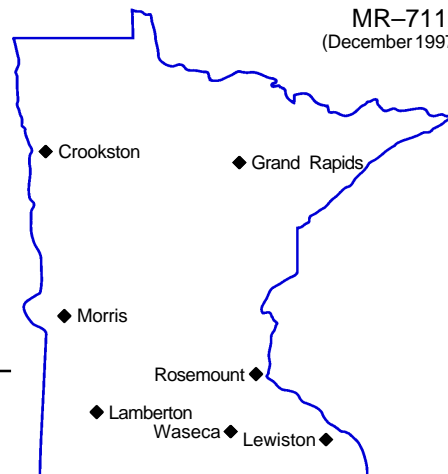


Minnesota Agricultural Experiment Station

VARIETY TRIALS

Alfalfa



Locations of alfalfa trials.

Successful production of alfalfa depends on selecting the best varieties for a particular farm. Varieties are compared for yield in trial plots on Minnesota Agricultural Experiment Station fields at Rosemount, Waseca, Lewiston, Lamberton, Morris, Crookston and Grand Rapids. These plots are handled so that factors affecting yield, winter survival and forage quality are as nearly the same for all varieties as is possible.

Test results for varieties available in Minnesota, old or new, are published as accumulated performance years averaged as a percent of Vernal or other check varieties over locations representative of risk of winter injury in specific regions of Minnesota: Rosemount and Waseca (Lewiston replaces Waseca beginning 1997), southeastern Minnesota; Lamberton, southwest Minnesota; Morris and Crookston, west central, central, and northwestern Minnesota; and Grand Rapids, northeastern Minnesota (see test locations map). Varieties of alfalfa are tested for winter survival and forage quality at selective experiment station fields of the Universities of Minnesota and Wisconsin-Madison.

Variety Classifications

Alfalfa varieties are classified as dormant, varieties developed to overwinter in Minnesota conditions, or non-dormant, varieties not expected to overwinter in Minnesota. Disease resistance and fall dormancy information as classified by the variety developer and published in Certified Alfalfa Seed Council Publication "Fall Dormancy & Pest Resistance Ratings for Alfalfa" is listed alphabetically in table 1A.

Performance information for variety's approved for Seed Certification and available in Minnesota is published in this report. Developers and marketers

of alfalfa varieties are listed in Table 1B. Contact information for these distributors, address and telephone number, is provided in Table 5. Only varieties with yield, winter survival or forage quality performance information are listed in Tables 2 through 4.

Interpreting the Tables

Yield information is expressed as a percent of the average of four check varieties (Vernal, Onedia, Onedia VR and Spredor 3). Forage quality information is expressed as a percent of Vernal, a winter-hardy, national check variety. Yield and forage quality are also reported by locations and averaged over test sites and production years. Performance of a variety is best determined by using test data from three test sites and three production years. Test data within a test site-region of the state is less reliable than performance over several sites.

The LSD (Least Significant Difference) figures listed for forage quality performance in table 4, under columns of tests, are statistical measures of variability within the trials. This statistic is used to determine whether the differences between two numbers is due to genetic difference in the varieties. If the difference between two varieties equals or exceeds the LSD value listed at the bottom of each test column, you can conclude that the higher quality variety was superior. If the difference is less, greater attention should be given to other traits important in making your variety choices.

Authors/Researchers

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ALFALFA **VARIETY TRIALS**

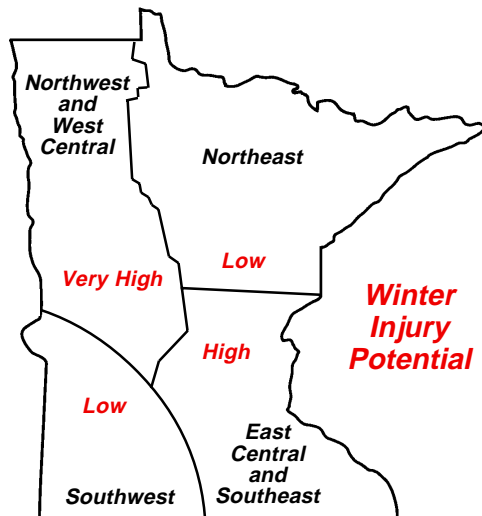
**Minnesota Agricultural Experiment Station — University of Minnesota
December 1997**

Results of public and private alfalfa tests conducted by the Minnesota Agricultural Experiment Station. Prepared by Neal P. Martin, extension agronomist-forages (612/625-3747; e-mail: <marti007@tc.umn.edu>), and Craig C. Sheaffer, agronomist (612/625-7224; e-mail: <sheaf001@tc.umn.edu>), Department of Agronomy and Plant Genetics, University of Minnesota, St. Paul, MN 55108.

Winter Hardiness

Severe winters make winter hardiness a prime consideration in variety selection for most of Minnesota. The 1989-90, 1991-92 and 1994-95 winters were very damaging to alfalfa stands over wide areas of the state. These winters confirmed previous observations about areas most subject to winter injury (see "Winter Injury Potential" map). Several ice sheet events last winter, 1996-97, and cold temperatures in April following limited green-up of alfalfa, combined to reduce older stands at Lamberton and Grand Rapids.

The greatest winter hardiness is needed in the northwest and west central Minnesota area. Because of the high frequency of severe winters in this area, only winter-hardy varieties should be selected. The east central and southeast area also experiences frequent severe winters. Winter-hardy varieties with high levels of disease resistances should be selected for this area. The southwest area seldom experiences severe winter injury because of dry soils, high soil potassium levels and neutral soil pH. The northeast area also seldom experiences severe winter injury because of dependable snow cover.



Winter Survival

Winter hardiness of varieties is extremely difficult to determine because winter injury can occur as a result of many different weather events, interacting with how alfalfa plants

of differing ages respond differently to various weather events. A new test called “Winter Survival” is used to determine winter hardiness of varieties. This standardized test, North American Alfalfa Conference Winter Survival Test, measures the survival of a variety after a severe winter. Tests are conducted annually at four or five locations, Arlington, Marshfield and Lancaster, Wisconsin and Rosemount and Morris, Minnesota, to provide a winter survival index (WSI). Table 3.

The WSI was pooled over all tests to provide an estimate of winter hardiness. This is presented with yield data in Table 2A. Varieties are rated from ‘superior’ to ‘adequate’ in winter survivability. Vernal, a traditional winter-hardy variety to which other varieties are often compared, is rated superior. Varieties rated ‘adequate’ in winter survivability are expected to be injured the most after a severe winter. Varieties not tested for winter survival are listed in Tables 2B-1 and 2B-2 and are listed alphabetically. If a variety does not have a WSI, the fall dormancy index is the next best indicator of winter hardiness (1 = very winter-hardy; 2 = winter-hardy; 3 and 4 = moderately winter-hardy).

Fall Dormancy and Yield

Fall dormancy ratings of varieties are listed alphabetically in table 1A. Varieties that are very fall dormant produce very little fall growth and are slow to recover after cutting. They usually are not high yielding, recover slowly for the second crop and produce only a small third crop because of early cessation of growth. Nevertheless, these are very dependable varieties in areas where frequent winter injury is expected and where soil moisture limits third crop yields. These types of varieties survived the 1989-90 and 1991-92 winters with little injury.

Fall dormant varieties are adaptable to all areas of the state. Forage yields vary among varieties in this group, primarily because of winter hardiness and disease resistance. Three or four years of consistent production can be expected from fall dormant varieties with high levels of winter hardiness.

Moderately fall dormant varieties produce good fall growth, are characterized by rapid recovery after harvest, and usually reach 1/10 bloom several days earlier than more dormant varieties. The general pattern of production for moderately dormant varieties under a four-harvest management has been to produce high yields during the first year after seeding, good yields similar to winter hardy, fall dormant varieties for year two, and reduced yields in years three and four. The reduced yields in years three and four are usually associated with winter injury.

Alfalfa yield of a given variety is predicted best after three test sites have been measured over four years of stand life (three years after seeding). Variety yield performance is not significantly different the first two years after seeding. Thus, to choose a variety for short term stands, use the ‘all location’ yield for ‘1-2 years’ after seeding. For long-term stands, choose varieties based on their performance over all locations three years after seeding. Varieties with less than three-test years are not accurately characterized for yield performance (Tables 2C-1 and 2C-2).

Annual Alfalfa

Non-dormant varieties, annual varieties under normal Minnesota winters, are characterized by extremely tall fall growth that continues until fall freeze-up. They produce similar yields as the moderately dormant varieties during the summer, but will produce more forage growth during the fall growth period. They will not survive most winters. These non-dormant varieties should only be grown for plow-down in the seeding year.

The Minnesota Agricultural Experiment Station and USDA released the non-dormant non-winter hardy variety, Nitro, in 1986. Nitro is a special-purpose alfalfa designed as a one-year hay source and a fall plow down crop. It was selected in Minnesota for increased concentration of nitrogen in the roots and for larger roots in which to store nitrogen. Nitro was the first alfalfa variety developed with specialized nitrogen accumulation attributes.

Other non-winter hardy varieties, dormancy 8 and 9, not listed in the tables include 5715, 5888, 13R Supreme, ABT 805, Alto, Baralfa 85, Condor, DK 180 ML, DK 189, El Grande, El Tigre Verde, Falcon, GT 13R Plus, Magna 8, Maricopa, Mesa, Moapa 69, Prestige, SW 8112, SW 8200, SW 8210, Tulare, Westar, WL 516, WL 525 HQ, Yolo, 5939, Baralfa 92, Beacon, Coronado, CUF 101, Magna 9, Mecca, Mecca II, Sundor, SW 9301, SW 14, UC Cibola, WL 605 and WL 612.

Forage Quality

Alfalfa varieties differ in forage quality or feeding value. Alfalfa varieties have been evaluated for forage quality at Rosemount on a fee basis since 1991 (Table 4). A standardized forage quality test has been performed at Arlington, Wisconsin and Rosemount, Minnesota since 1995. Varieties in the seeding year are evaluated on one cut taken in late August. Production year evaluation (first year after seeding only) is done by analyzing each of three cuttings taken at late bud to 1/10 bloom stages of maturity.

Relative feed value index ranks varieties on their potential digestible dry matter intake. Milk per ton is estimated using a variety's crude protein and neutral detergent fiber concentrations to determine the amount of alfalfa needed to match the protein and energy needs of a 1,350 pound cow producing 60 pounds of milk per day with a diet including corn grain and minerals. Milk per acre quantifies the forage of an alfalfa variety as "tons per acre" multiplied by "milk per ton" (theoretical milk production per ton, calculated from protein and fiber values).

Disease Resistance and Stand Persistence

Alfalfa root and crown diseases occur in most Minnesota soils. The most important diseases are: bacterial wilt, Phytophthora root rot, Fusarium wilt, anthracnose, Verticillium wilt and Aphanomyces root rot. Plant resistance is available for all six diseases. The variety resistance ratings for each disease are presented in Table 1. Moderate resistance (MR) to a disease will provide protection to a variety under most Conditions. Under severe disease conditions, however, either resistance (R) or high resistance (HR) are required for protection.

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. All varieties can benefit from improved disease resistance. However, it is especially important for moderately fall dormant varieties to have at least R levels of disease resistance to stay productive for more than two years after the seeding year under intensive management (four cuts per season) in the east central and southeast area of Minnesota.

Bacterial Wilt—This disease is prevalent in most areas of the state. Wilt-susceptible varieties are poor risks and should not be grown. They generally show losses in stand by the end of the second year after seeding. In some cases where infection is severe, stand losses are often observed by the end of the first year after seeding. Stand reductions after winter are often due to a combination of wilt damage and winter injury.

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

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

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

Verticillium Wilt—This potentially destructive fungus disease was first found in several eastern Minnesota fields in 1981. It has usually been found in two- or three-year-old fields. Its spread in the state has been slow. Planting resistant varieties will help provide insurance for long-lived stands. Varieties having at least a low level of resistance are indicated in Table 1.

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

Table 1A. Fall dormancy and disease resistance of alfalfa varieties eligible for certification and marketed in Minnesota.

Note Key:

1] Varieties includes those marketed in Minnesota for which disease resistance ratings were provided. Varieties which are not seeded in a Minnesota yield trial are excluded from Table 2.

[2] Fall Dormancy and Pest Resistance Ratings as reported in CASC publication, or provided by a developer (^). Dormancy is based on fall growth in mid-October after cutting 1st week of September. 9=tallest (tend to be least winterhardy), 1=shortest.

[3] Diseases: BW=Bacterial Wilt, PRR=Phytophthora Root Rot, FW=Fusarium Wilt, AN=Anthracnose, VW=Verticillium Wilt, APH=Aphanomyces Root Rot.

[4] CASC Resistance Rating (percent resistant plants): HR=high resistance (51 +), R=resistant (31-50), MR=moderate resistance (16-30), LR=low resistance (6-15), and S=susceptible (0-5).

| Variety[1] | FD [2] | Disease Resistance Ratings [3,4] | | | | | VW | APH |
|------------------|----------------|----------------------------------|-----|----|----|----|----|-----|
| | | BW | PRR | FW | AN | | | |
| <u>Dormant</u> | | | | | | | | |
| 120 | 3 | HR | R | R | LR | — | — | |
| 2555ML | 2 | HR | HR | HR | HR | R | R | |
| 3324 | 3 [^] | HR | HR | HR | HR | R | R | |
| 3452-ML | 3 | HR | HR | HR | HR | R | R | |
| 5246 | 3 | HR | HR | HR | HR | R | MR | |
| 5262 | 2 | HR | R | MR | — | LR | — | |
| 5312 | 3 | HR | HR | HR | HR | HR | R | |
| 5347LH | 3 [^] | HR | HR | HR | HR | MR | R | |
| 5454 | 4 | R | HR | HR | HR | MR | LR | |
| 620 | 2 | HR | HR | HR | HR | R | R | |
| 630 | 4 | HR | R | R | MR | MR | — | |
| 631 | 4 | HR | HR | HR | R | R | MR | |
| 8498 | 3 [^] | HR | HR | HR | HR | R | R | |
| 9326 | 3 | HR | HR | HR | R | R | R | |
| A-295 | 2 | HR | HR | HR | R | R | R | |
| A-395 | 3 | HR | HR | HR | HR | R | R | |
| ABT 205 | 2 | HR | HR | HR | R | R | R | |
| ABT 227LH | 2 [^] | HR | HR | R | HR | R | R | |
| ABT 405 | 4 | HR | HR | HR | R | HR | R | |
| Ace | 4 | HR | HR | HR | HR | R | R | |
| Achieva | 3 | R | HR | HR | HR | R | R | |
| Affinity+Z | 4 | HR | HR | HR | HR | HR | R | |
| Agate | 2 | HR | R | HR | MR | — | — | |
| Aggressor | 4 | HR | HR | HR | HR | R | MR | |
| Alfagraze | 2 | R | LR | R | MR | — | — | |
| AlfaStar | 4 | HR | HR | HR | HR | R | R | |
| Allegro | 4 | HR | HR | HR | HR | R | R | |
| ALPHA 2001 | 4 | HR | HR | HR | HR | HR | R | |
| Alpine | 2 | R | R | R | R | R | — | |
| AmeriGraze 401+Z | 4 | HR | HR | HR | HR | HR | R | |
| AmeriGuard 301 | 3 [^] | HR | HR | HR | HR | R | R | |
| Apollo Supreme | 4 | HR | R | HR | HR | R | — | |
| Arrest | 3 [^] | HR | HR | R | HR | R | R | |
| Arrow | 3 | HR | HR | HR | MR | R | — | |
| Aspen | 4 | HR | HR | HR | HR | R | R | |

Table 1A continued. Fall dormancy and disease resistance of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | FD [2] | Disease Resistance Ratings [3,4] | | | | | |
|----------------|----------------|----------------------------------|-----|----|----|----|-----|
| | | BW | PRR | FW | AN | VW | APH |
| Avalanche +Z | 2 | HR | HR | HR | HR | HR | R |
| Award | 4 | HR | HR | HR | HR | HR | R |
| Banquet | 4 | HR | HR | HR | HR | HR | R |
| Baralfa 32 IQ | 3 | HR | HR | HR | HR | R | HR |
| Baralfa 54 | 5 | R | HR | HR | HR | R | — |
| Big Horn | 4 | HR | HR | HR | HR | R | HR |
| Blazer XL | 3 | R | HR | HR | HR | R | R |
| Bolt ML | 3 | R | HR | HR | HR | R | HR |
| Bountiful Plus | 3 [^] | HR | HR | HR | R | HR | — |
| Bounty | 2 | HR | HR | HR | HR | R | R |
| Break-Thru | 3 | HR | HR | HR | MR | R | — |
| Breakout | 4 [^] | HR | HR | HR | HR | R | HR |
| Champion LH | 3 [^] | HR | HR | Hr | HR | R | R |
| Ciba 2444 | 3 | HR | HR | HR | HR | R | R |
| Ciba 2888 | 3 | HR | HR | HR | HR | HR | R |
| Columbia 2000 | 2 [^] | R | MR | R | MR | MR | — |
| Complete | 3 | HR | HR | HR | HR | HR | R |
| Crown II | 3 | HR | HR | HR | HR | R | — |
| Crystal | 4 | HR | HR | HR | R | R | LR |
| Cut 'N' Graze | 3 | R | R | HR | MR | LR | LR |
| Dart | 3 | HR | HR | HR | R | R | — |
| Dawn | 3 [^] | HR | HR | HR | R | R | MR |
| Defiant | 2 | HR | HR | HR | R | HR | R |
| Demand | 3 | HR | HR | HR | HR | HR | R |
| Depend+EV | 4 | HR | HR | HR | HR | HR | R |
| Dividend | 2 | HR | HR | HR | HR | R | R |
| DK 122 | 2 | HR | HR | R | HR | R | — |
| DK 127 | 3 | HR | HR | R | HR | R | HR |
| DK 133 | 4 | HR | HR | HR | HR | R | R |
| DK 140 | 4 | HR | HR | HR | HR | R | HR |
| DK 141 | 4 | HR | HR | HR | HR | HR | HR |
| DK 142 | 4 | HR | HR | HR | R | R | HR |
| Dominator | 4 | HR | HR | HR | HR | R | R |
| Eliminator | 3 [^] | HR | HR | HR | R | R | MR |
| Empire | 2 | HR | HR | HR | HR | R | R |
| Enhancer | 4 | HR | HR | HR | R | R | MR |
| Envy | 3 | HR | R | HR | HR | R | — |
| Evolution | 2 | HR | HR | HR | HR | R | R |
| Exceed | 3 [^] | HR | HR | HR | HR | R | R |
| Extend | 4 | HR | HR | R | HR | R | R |
| Feast | 3 [^] | HR | HR | HR | HR | R | R |
| Forecast 1000 | 3 | HR | HR | HR | R | R | R |
| Forecast 3000 | 4 | HR | R | HR | R | R | MR |
| Forerunner | 2 | HR | HR | HR | HR | HR | HR |
| Fortress | 4 | R | HR | R | — | R | — |

Table 1A continued. Fall dormancy and disease resistance of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | FD [2] | Disease Resistance Ratings [3,4] | | | | | | APH |
|----------------|--------|----------------------------------|-----|----|----|----|----|-----|
| | | BW | PRR | FW | AN | VW | | |
| Garst 636 | 2 | HR | R | R | MR | R | — | |
| Garst 645 | 3 | HR | HR | R | HR | R | MR | |
| Gateway | 4^ | HR | HR | HR | HR | R | R | |
| GH 755 | 4 | HR | HR | HR | HR | R | R | |
| GH 757 | 4^ | HR | HR | HR | HR | HR | HR | |
| GH 766 QP | 3 | HR | HR | HR | HR | R | R | |
| GH 767 | 2 | HR | HR | HR | HR | R | R | |
| GH 777 | 3 | HR | HR | HR | R | R | R | |
| GH 787 | 3 | HR | HR | R | HR | R | R | |
| GH 797 | 3 | HR | HR | HR | HR | HR | — | |
| Good as Gold | 4 | HR | HR | HR | R | R | LR | |
| Green Field | 3 | HR | HR | HR | HR | R | R | |
| Guardian | 3 | HR | HR | HR | HR | HR | R | |
| HayGrazer | 4 | HR | R | HR | R | R | MR | |
| Imperial | 3 | HR | HR | HR | HR | R | R | |
| Innovator +Z | 3 | HR | HR | HR | HR | HR | R | |
| Interceptor | 3^ | HR | HR | HR | HR | R | R | |
| Iroquois | 2 | HR | S | MR | S | S | — | |
| Jade | 4 | HR | HR | R | R | R | — | |
| Jade II | 4 | HR | HR | HR | R | R | MR | |
| Lactator | 2 | HR | R | HR | HR | HR | R | |
| Laser | 4 | HR | HR | HR | R | R | MR | |
| Legend | 4 | HR | HR | HR | HR | R | — | |
| LegenDairy | 2 | HR | HR | HR | HR | HR | R | |
| LegenDairy 2.0 | 3 | HR | HR | HR | HR | R | R | |
| Lightning | 3 | HR | HR | HR | HR | R | HR | |
| MagnaGraze | 3 | HR | HR | HR | R | R | R | |
| Magnum III | 4 | R | R | R | MR | MR | LR | |
| Magnum III-Wet | 3 | R | R | R | MR | MR | MR | |
| Magnum IV | 4 | HR | HR | HR | R | R | MR | |
| Max 329 | 3 | HR | HR | HR | HR | HR | R | |
| Maxi-Graze GT | 2^ | HR | HR | HR | R | R | R | |
| MP2000 | 3 | HR | HR | HR | HR | R | HR | |
| Multi-plier | 3 | HR | HR | HR | HR | R | — | |
| MultiKing 1 | 3 | HR | R | HR | R | R | — | |
| MultiMist | 3 | HR | HR | HR | HR | R | R | |
| MultiQueen | 4 | HR | HR | HR | HR | R | R | |
| Nemesis | 3^ | R | HR | HR | HR | HR | HR | |
| Notice | 3 | HR | HR | HR | HR | R | R | |
| Oneida | 3 | HR | HR | HR | S | — | — | |
| Oneida VR | 3 | R | MR | HR | MR | HR | — | |
| Ovation | 4 | HR | HR | HR | HR | HR | R | |
| Pacesetter | 2 | HR | HR | R | HR | R | — | |
| Persist | 4 | HR | HR | HR | R | R | MR | |
| Profit | 2 | HR | R | HR | MR | R | — | |

Table 1A continued. Fall dormancy and disease resistance of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | FD [2] | Disease Resistance Ratings [3,4] | | | | | |
|--------------------|----------------|----------------------------------|-----|----|----|----|-----|
| | | BW | PRR | FW | AN | VW | APH |
| Proof | 3 | HR | HR | HR | HR | R | R |
| Quantum | 2 | HR | HR | HR | HR | HR | R |
| Rainier | 3 | HR | HR | HR | HR | R | HR |
| Ranger | 3 | MR | S | MR | S | S | — |
| RFV-2000 | 3 | HR | HR | HR | HR | R | LR |
| Rhino | 3 | HR | R | R | R | R | R |
| Rushmore | 4 | HR | HR | HR | HR | R | HR |
| Rustler II | 4 | HR | HR | HR | HR | HR | R |
| Saranac | 4 | R | S | R | S | S | — |
| Sierra | 3 | HR | HR | HR | R | R | MR |
| Spartan | 3 | HR | HR | HR | HR | R | — |
| Spirit | 3 | HR | HR | HR | R | R | MR |
| Spredor 3 | 1 | HR | MR | HR | R | MR | S |
| Stampede | 3 | HR | HR | R | — | R | R |
| Sterling | 2 | HR | HR | HR | HR | R | R |
| SuperCuts | 4 | HR | HR | HR | HR | HR | R |
| Surpass | 3 | HR | R | HR | MR | R | — |
| Synergy | 3 | HR | HR | HR | HR | R | R |
| Target | 4 [^] | HR | R | HR | MR | — | — |
| Target II | 4 | HR | HR | HR | R | R | S |
| Target II + | 3 [^] | HR | HR | HR | R | R | MR |
| Teton | 1 | LR | LR | MR | S | — | — |
| TMF 421 | 2 [^] | HR | HR | R | HR | HR | HR |
| TMF Generation | 4 | HR | HR | HR | HR | HR | R |
| TMF Multi-plier II | 3 [^] | HR | HR | HR | HR | HR | R |
| Total+Z | 3 | HR | HR | HR | HR | HR | R |
| Trailblazer | 2 [^] | HR | HR | R | HR | HR | R |
| Travois | 1 | R | S | MR | S | — | — |
| Treasure | 3 | HR | R | HR | HR | R | — |
| Trident II | 3 | HR | HR | R | R | R | MR |
| UltraLeaf 87 | 3 | HR | HR | HR | HR | R | R |
| Venture | 4 | HR | R | R | HR | R | R |
| Vernal | 2 | R | — | MR | — | — | — |
| Viking 1 | 2 | R | R | HR | R | HR | — |
| Vitro | 3 | HR | HR | HR | HR | HR | R |
| Voyager II | 4 | HR | HR | HR | R | R | MR |
| Webfoot MPR | 4 | HR | HR | HR | HR | HR | R |
| WetLand | 3 | R | HR | R | R | MR | MR |
| Wintergreen | 3 | HR | HR | HR | HR | HR | R |
| Winterking | 3 | HR | HR | HR | HR | HR | R |
| Winterstar | 2 | HR | HR | HR | HR | HR | R |
| WL 226 | 3 | HR | HR | HR | HR | R | MR |
| WL 252 HQ | 2 | HR | HR | HR | HR | R | LR |
| WL 320 | 4 | R | R | R | MR | MR | — |
| WL 322 HQ | 4 | HR | R | HR | MR | R | — |

Table 1A continued. Fall dormancy and disease resistance of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | FD [2] | Disease Resistance Ratings [3,4] | | | | | |
|--------------------|----------------|----------------------------------|-----|----|----|----|-----|
| | | BW | PRR | FW | AN | VW | APH |
| WL 323 | 4 | HR | HR | HR | HR | R | R |
| WL 324 | 3 | HR | HR | HR | HR | R | HR |
| WL 325 HQ | 3 | HR | HR | HR | HR | R | R |
| Wrangler | 2 | R | HR | R | LR | LR | — |
| X-Grazer | 2 [^] | HR | HR | HR | HR | HR | R |
| Zenith | 3 | HR | HR | HR | HR | R | R |
| Non-dormant | | | | | | | |
| Nitro | 8 | — | MR | — | R | — | — |

Table 1B. Sources of alfalfa varieties eligible for certification and marketed in Minnesota.

Note Key:

[1] Varieties includes those marketed in Minnesota for which disease resistance ratings were provided. Varieties which are not seeded in a Minnesota yield trial are excluded from Table 2.

[2] Developers list generally follows Certified Alfalfa Seed Council publication "Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties" (CASC 1997/98 Edition).

[3] Seed source numbers refer to the "key" number in Table 5, "1998 Forage Seed Sources."

| Variety[1] | Developer or Marketer[2] | Seed Source[3] |
|----------------|---------------------------------------|----------------|
| Dormant | | |
| 120 | DEKALB Genetics | 22 |
| 2555ML | L.L. Olds/Interstate Payco/Garst Seed | 37, 40 |
| 3324 | L.G. Seeds | 43 |
| 3452-ML | L. L. Olds/Interstate/Payco | 37, 40 |
| 5246 | Pioneer Hi-Bred Int'l. | 53 |
| 5262 | Pioneer Hi-Bred Int'l. | 53 |
| 5312 | Pioneer Hi-Bred Int'l. | 53 |
| 5347LH | Pioneer Hi-Bred Int'l. | 53 |
| 5454 | Pioneer Hi-Bred Int'l. | 53 |
| 620 | ICI Seeds/Garst Seeds | 28, 37 |
| 630 | ICI Seeds/Garst Seeds | 28 |
| 631 | ICI Seeds/Garst Seeds | 28 |
| 8498 | Mallard Seeds | 44 |
| 9326 | L.G. Seeds | 43 |
| A-295 | PGI/MBS | 45 |
| A-395 | PGI/MBS | 45 |
| ABT 205 | AgriBioTech | 58 |
| ABT 227LH | AgriBioTech | 41 |
| ABT 405 | AgriBioTech | 58 |
| Ace | W-L Research/UAP Seeds | 49, 66 |

Table 1B continued. Sources of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | Developer or Marketer[2] | Seed Source[3] |
|------------------|-----------------------------------|-------------------|
| Achieva | Agway/Allied Seed | 7, 8 |
| Affinity+Z | America's Alfalfa | 9, 37, 61, 63, 66 |
| Agate | USDA/Minn.AES | 1, 24, 54, 69 |
| Aggressor | America's Alfalfa | 63 |
| Alfagraze | America's Alfalfa | 9, 37, 61, 63, 66 |
| AlfaStar | Hoffman Seed/Sexauer | 35 |
| Allegro | Mycogen Seeds | 47 |
| ALPHA 2001 | Great Lakes Hybrids | 31 |
| Alpine | Oasis/Spangler/Bio-Plant Research | 13 |
| AmeriGraze 401+Z | America's Alfalfa | 9, 37 |
| AmeriGuard 301 | America's Alfalfa | 9, 37 |
| Apollo Supreme | America's Alfalfa | 9, 63 |
| Arrest | Northrup King | 50 |
| Arrow | America's Alfalfa | 63 |
| Aspen | SeedTec/Brown Seed Farms | 14 |
| Avalanche +Z | America's Alfalfa | 9, 37, 63 |
| Award | Asgrow Seed | 11 |
| Banquet | Tri-State Seed & Ag | 64 |
| Baralfa 32 IQ | Barenbrug USA | 12 |
| Baralfa 54 | Barenbrug USA | 12 |
| Big Horn | Cargill Hybrid Seeds | 17 |
| Blazer XL | Croplan Genetics/Cenex LOL | 18 |
| Bolt ML | Research Seeds/Jung Seed Genetics | 38 |
| Bountiful Plus | Tri-State Seed & Ag | 64 |
| Bounty | PGI/MBS | 45, 62 |
| Break-Thru | Custom Farm Seed | 23 |
| Breakout | Research Seeds/Brown Seed Farms | 14 |
| Champion LH | Kaltenberg Seed Farms | 39 |
| Ciba 2444 | Novartis Seeds | 50 |
| Ciba 2888 | Novartis Seeds | 50 |
| Columbia 2000 | Kaltenberg Seed Farms | 1, 7, 8, 39 |
| Complete | Arrow Seed/Fontanelle Hybrids | 26 |
| Crown II | Cargill Hybrid Seeds | 17 |
| Crystal | PGI/MBS | 45 |
| Cut 'N' Graze | AgriPro Seeds | 3 |
| Dart | AgriPro Seeds | 3 |
| Dawn | AgriPro Seeds | 3 |
| Defiant | AgriPro Seeds | 3 |
| Demand | AgriPro Seeds | 3 |
| Depend+EV | AgriPro Seeds | 3 |
| Dividend | Agway/Allied Seed | 8 |
| DK 122 | DEKALB Genetics | 22 |
| DK 127 | DEKALB Genetics | 22 |
| DK 133 | DEKALB Genetics | 22 |
| DK 140 | DEKALB Genetics | 22 |
| DK 141 | DEKALB Genetics | 22 |
| DK 142 | DEKALB Genetics | 22 |
| Dominator | AgriPro Seeds | 3 |
| Eliminator | La Crosse Seed | 41 |
| Empire | Brunner Seed Farm | 15, 56 |

Table 1B continued. Sources of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | Developer or Marketer[2] | Seed Source[3] |
|----------------|-------------------------------------|-------------------|
| Enhancer | Rosen's/Bio-Plant Research | 13 |
| Envy | Peterson Seed | 52 |
| Evolution | Mycogen Seeds | 47 |
| Exceed | Specialty Seeds | 60 |
| Extend | Spangler/Grassland West | 59 |
| Feast | AgriPro Seeds | 3 |
| Forecast 1000 | Dairyland Seed | 21 |
| Forecast 3000 | Dairyland Seed | 21 |
| Forerunner | Research Seeds/Brown Seed Farms | 14 |
| Fortress | Novartis Seeds | 50 |
| Garst 636 | Garst Seeds | 28 |
| Garst 645 | Garst Seeds | 28 |
| Gateway | Jung Seed Genetics | 38 |
| GH 755 | Golden Harvest Seeds | 30 |
| GH 757 | Golden Harvest Seeds | 30 |
| GH 766 QP | Golden Harvest Seeds | 30 |
| GH 767 | Golden Harvest Seeds | 30 |
| GH 777 | Golden Harvest Seeds | 30 |
| GH 787 | Golden Harvest Seeds | 30 |
| GH 797 | Peterson Seed/Golden Harvest | 17, 30 |
| Good as Gold | Top Farm Hybrids/Hoegemeyer Hybrids | 45, 62 |
| Green Field | Hoegemeyer Hybrids | 34, 54 |
| Guardian | AgVenture | 4, 5, 6 |
| HayGrazer | Great Plains Research | 32, 39 |
| Imperial | Top Farm Hybrids/Cole Growers | 62 |
| Innovator +Z | America's Alfalfa | 9, 37, 61, 63, 66 |
| Interceptor | AgriPro Seeds | 3 |
| Iroquois | Cornell Univ. | 1, 7 |
| Jade | NC+ Hybrids | 48 |
| Jade II | NC+ Hybrids | 48 |
| Lactator | Elk Mound Feed & Farm Supply | 25 |
| Laser | J-V Seeds/Patriot Seeds/Rainier | 51 |
| Legend | Cenex/Land O'Lakes | 18 |
| LegenDairy | Croplan Genetics/Cenex LOL | 18 |
| LegenDairy 2.0 | Croplan Genetics/Cenex LOL | 18 |
| Lightning | Jung Seed Genetics | 38 |
| MagnaGraze | Dairyland Seed | 21 |
| Magnum III | Dairyland Seed | 21 |
| Magnum III-Wet | Dairyland Seed | 21 |
| Magnum IV | Dairyland Seed | 21 |
| Max 329 | AgriBioTech/L & H Seeds | 41, 58 |
| Maxi-Graze GT | Croplan Genetics/Cenex LOL | 18 |
| MP2000 | Croplan Genetics/Cenex LOL | 18 |
| Multi-plier | Mycogen Seeds | 47 |
| MultiKing 1 | Novartis Seeds | 50 |
| MultiMist | Lemke Seeds | 42 |
| MultiQueen | Fred Gutwein & Sons | 27, 64 |
| Nemesis | Renk Seed | 57 |
| Notice | Midwest Seed Genetics | 46 |
| Oneida | Cornell Univ. | check |

Table 1B continued. Sources of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | Developer or Marketer[2] | Seed Source[3] |
|--------------------|-------------------------------------|-------------------|
| Oneida VR | N.Y.S.I.P./Public | check |
| Ovation | Callahan Enterprises | 16 |
| Pacesetter | Research Seeds/Brown Seed Farms | 14 |
| Persist | Kaltenberg Seed Farms/Doeblers Seed | 39 |
| Profit | Ciba Seeds/Wensman Seed | 68 |
| Proof | Mycogen Seeds | 47 |
| Quantum | Renk Seed | 57 |
| Rainier | Novartis Seeds | 50 |
| Ranger | USDA/Nebr.AES | 1 |
| RFV-2000 | Custom Farm Seed | 23 |
| Rhino | Geertson Seed Farms | 29 |
| Rushmore | Novartis Seeds | 50 |
| Rustler II | Andrews Seed | 10 |
| Saranac | Cornell Univ. | 24, 54 |
| Sierra | NC+ Hybrids | 48 |
| Spartan | Kinder Seed/Allied Seed | 8 |
| Spirit | Fontanelle Hybrids | 26 |
| Spredor 3 | Novartis Seeds | 50 |
| Stampede | Agway/Allied Seed | 8, 52 |
| Sterling | Cargill Hybrid Seeds | 17 |
| SuperCuts | AgriBioTech | 2, 58 |
| Surpass | Andrews Seed | 7, 10, 56 |
| Synergy | Crow's Hybrids | 19, 20 |
| Target | Ziller Seed | 55 |
| Target II | Bio-Plant Research | 55 |
| Target II + | Bio-Plant Research | 55 |
| Teton | S.Dakota Agr.Exp.Sta. | 1, 24 |
| TMF 421 | Mycogen Seeds | 47 |
| TMF Generation | Mycogen Seeds | 47 |
| TMF Multi-plier II | Mycogen Seeds | 47 |
| Total+Z | America's Alfalfa | 9, 37, 61, 63, 66 |
| Trailblazer | Croplan Genetics/Cenex LOL | 18 |
| Travois | S.Dakota Agr.Exp.Sta. | 1, 7, 24 |
| Treasure | Clark Seeds/AgriBioTech | 1 |
| Trident II | Cargill Hybrid Seeds | 17 |
| UltraLeaf 87 | La Crosse Seed | 41 |
| Venture | Top Farm/Halsey/Cole Growers | 62 |
| Vernal | USDA/Wisc.AES | 1, 7, 24, 54, 56 |
| Viking 1 | Novartis Seeds | 50 |
| Vitro | North-Gro Seed | 49 |
| Voyager II | Lemke Seeds/Bio-Plant Research | 70 |
| Webfoot MPR | Great Lakes Hybrids | 31 |
| WetLand | Bio-Plant Research | 70 |
| Wintergreen | Renk Seed | 57 |
| Winterking | Wensman Seed | 68 |
| Winterstar | Wensman Seed | 68 |
| WL 226 | W-L Research | 6, 33, 67 |
| WL 252 HQ | W-L Research | 6, 33, 67 |
| WL 320 | W-L Research | 6, 33, 67 |
| WL 322 HQ | W-L Research | 6, 33, 67 |

Table 1B continued. Sources of alfalfa varieties eligible for certification and marketed in Minnesota.

| Variety[1] | Developer or Marketer[2] | Seed Source[3] |
|---------------------------|--------------------------|-----------------|
| WL 323 | W-L Research | 6, 33, 67 |
| WL 324 | W-L Research | 6, 33, 67 |
| WL 325 HQ | W-L Research | 6, 33, 67 |
| Wrangler | USDA/Nebr.AES | 1,7,24,54,56,69 |
| X-Grazer | Cargill Hybrid Seeds | 30 |
| Zenith | ICI Seeds/Garst Seeds | 28 |
| <u>Non-dormant</u> | | |
| Nitro | USDA/Minn.AES | 54 |

Table 2A-1. Average yields of alfalfa varieties tested for Winter Survival Index (WSI) expressed as percentage of check varieties for all seedings (tests) with one or more harvest years (1967-97). Average yield is for years 1-2 after seeding and year 3 per test location. Sorted by yield for "ALL YR1-2" within each WSI category.

Note Key:

[1] Winter Survival Index from joint Minnesota-Wisconsin trials 1996-97 (Table 3 is 1997).

[2] Each seeding year in any location counts as one Test Site.

[3] Total production years (after seeding year) for any location with reliable data. Two production years needed for YR1-2 data. (Seed years or production years that winterkilled or otherwise developed unacceptably variable stands are excluded.)

Locations: R-W-LEW=Rosemount-Waseca-Lewiston, ...ALL test sites.

| Variety | WSI [1] | R-W-LEW YR1-2 | R-W-LEW YR3 | ALL YR1-2 | ALL YR3 | Test Sites [2] | Production Yrs1-3 [3] |
|---|---------|---------------|-------------|-----------|---------|----------------|-----------------------|
| Checks (T/Ac 15%mc Hay) | — | 6.12 | 5.42 | 5.60 | 5.04 | 108 | 226 |
| <u>Superior Winter Survival</u> | | | | | | | |
| ABT 205 | 1.6 | 107 | — | 102 | — | 7 | 9 |
| Vernal (ck) | 1.8 | 100 | 100 | 100 | 100 | 78 | 195 |
| <u>Very Good Winter Survival</u> | | | | | | | |
| 5454 | 2.3 | 111 | — | 111 | 101 | 20 | 29 |
| 620 | 2.6 | 111 | — | 110 | — | 11 | 16 |
| Wintergreen | 2.5 | 115 | — | 109 | 139 | 3 | 6 |
| Defiant | 2.3 | 108 | — | 108 | — | 7 | 12 |
| Avalanche+Z | 2.4 | 111 | — | 108 | — | 9 | 12 |
| Extend | 2.9 | 107 | — | 107 | — | 4 | 5 |
| 5262 | 2.3 | 109 | 105 | 106 | 110 | 18 | 41 |
| Notice | 2.6 | 106 | — | 106 | — | 3 | 6 |
| MP 2000 | 2.7 | 112 | — | 106 | — | 4 | 8 |
| Garst 645 | 2.8 | 106 | 102 | 106 | 127 | 13 | 24 |

Table 2A-1 continued. Average yields of alfalfa varieties tested for Winter Survival Index (WSI) expressed as percentage of check varieties for all seedings (tests) with one or more harvest years (1967-97). Average yield is for years 1-2 after seeding and year 3 per test location. Sorted by yield for "ALL YR1-2" within each WSI category.

| Variety | WSI [1] | R-W-LEW YR1-2 | R-W-LEW YR3 | ALL YR1-2 | ALL YR3 | Test Sites [2] | Production Yrs1-3 [3] |
|-----------------------------|---------|---------------|-------------|-----------|---------|----------------|-----------------------|
| ABT 405 | 2.6 | 106 | — | 104 | — | 3 | 6 |
| DK 127 | 2.6 | 104 | — | 102 | — | 13 | 14 |
| Rushmore | 2.7 | 104 | — | 102 | 100 | 5 | 11 |
| Ranger | 2.9 | 100 | 101 | 102 | 102 | 8 | 24 |
| Complete | 2.7 | 108 | — | 101 | — | 3 | 5 |
| Innovator+Z | 2.3 | 103 | — | 100 | — | 8 | 10 |
| LegenDairy 2.0 | 2.8 | 99 | — | 99 | — | 3 | 4 |
| MultiMist | 2.7 | — | — | — | — | 0 | 0 |
| Forerunner | 2.7 | — | — | — | — | 4 | 4 |
| Exceed | 2.8 | — | — | — | — | 3 | 3 |
| Rainier | 2.9 | — | — | — | — | 5 | 3 |
| Good Winter Survival | | | | | | | |
| Aspen | 3.2 | 108 | — | 109 | — | 4 | 5 |
| Ciba 2888 | 3.2 | 104 | — | 109 | — | 6 | 9 |
| 5312 | 3.0 | 111 | — | 108 | 116 | 13 | 15 |
| GH 767 | 3.0 | 114 | — | 107 | 115 | 5 | 8 |
| UltraLeaf 87 | 3.2 | 108 | — | 107 | 90 | 6 | 14 |
| Dart | 3.2 | 108 | 108 | 106 | 111 | 13 | 34 |
| Viking 1 | 3.0 | 108 | 95 | 104 | 100 | 9 | 19 |
| Lightning | 3.3 | 103 | — | 101 | — | 5 | 10 |
| Guardian | 3.0 | 111 | — | 99 | — | 3 | 6 |
| SuperCuts | 3.4 | — | — | 97 | — | 3 | 5 |
| Fortress | 3.8 | 102 | 84 | 97 | 90 | 8 | 24 |
| 8498 | 3.1 | — | — | — | — | 3 | 3 |
| Ace | 3.1 | — | — | — | — | 1 | 0 |
| Columbia 2000 | 3.1 | — | — | — | — | 3 | 3 |

Table 2B-1. Average yields of alfalfa varieties with three or more seedings with one or more harvest years data (1967-1997) NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

Note Key:

[1] Each seeding year in any location counts as one Test Site.

[2] Total production years (after seeding year) for any location with reliable data. Two production years needed for YR1-2 data. (Seed years or production years that winterkilled or otherwise developed unacceptably variable stands are excluded.)

Locations: R-W-LEW=Rosemount-Waseca-Lewiston, ...ALL test sites.

| Variety | R-W-LEW YR1-2 | R-W-LEW YR3 | ALL YR1-2 | ALL YR3 | Test Sites [1] | Production Yrs1-3 [2] |
|----------------|------------------|----------------|--------------|------------|-------------------|--------------------------|
| 120 | 111 | 115 | 109 | 112 | 10 | 29 |
| 2555ML | 107 | — | 107 | — | 7 | 11 |
| 3452ML | 101 | — | 104 | — | 5 | 9 |
| 5246 | 109 | 98 | 108 | 112 | 14 | 29 |
| 630 | 110 | 113 | 107 | 109 | 11 | 29 |
| 631 | 110 | — | 109 | — | 11 | 17 |
| A-295 | 109 | 95 | 109 | 95 | 3 | 5 |
| A-395 | 106 | — | 106 | — | 3 | 5 |
| Achieva | 107 | 91 | 108 | 91 | 4 | 9 |
| Affinity+Z | 103 | — | 104 | — | 7 | 11 |
| Agate | 101 | 110 | 99 | 106 | 20 | 56 |
| Aggressor | 101 | 95 | 101 | 109 | 10 | 23 |
| Alfagraze | 102 | 85 | 100 | 99 | 7 | 19 |
| AlfaStar | 106 | — | 107 | — | 3 | 5 |
| ALPHA 2001 | — | — | 103 | — | 4 | 6 |
| Alpine | 110 | 108 | 105 | 118 | 5 | 15 |
| Apollo Supreme | 107 | 108 | 101 | 105 | 7 | 20 |
| Arrow | 108 | 105 | 107 | 107 | 11 | 31 |
| Award | — | — | — | — | 4 | 3 |
| BANQUET | 99 | — | 99 | — | 4 | 5 |
| Blazer XL | 101 | — | 103 | 101 | 3 | 8 |
| Bounty | 107 | — | 113 | — | 5 | 10 |
| Break-Thru | 104 | 95 | 99 | 95 | 8 | 22 |
| Ciba 2444 | 114 | — | 114 | — | 5 | 5 |
| Crown II | 112 | — | 106 | 116 | 6 | 15 |
| Crystal | 101 | 95 | 105 | 112 | 6 | 16 |
| Dawn | 101 | 98 | 102 | 101 | 8 | 19 |
| Demand | 104 | — | 101 | — | 4 | 7 |
| Depend+EV | 103 | — | 103 | 130 | 4 | 7 |
| Dividend | 102 | — | 104 | 101 | 9 | 16 |
| DK 122 | 104 | 60 | 104 | 103 | 18 | 43 |
| DK 133 | 107 | 96 | 108 | 103 | 14 | 29 |
| Dominator | 108 | 108 | 106 | 108 | 4 | 9 |
| Eliminator | 103 | 84 | 103 | 92 | 5 | 13 |
| Empire | 96 | — | 98 | — | 3 | 6 |
| Enhancer | 108 | — | 107 | — | 6 | 10 |
| Envy | 111 | 92 | 105 | 107 | 7 | 18 |
| Evolution | 109 | 99 | 106 | 102 | 7 | 12 |
| Garst 636 | 108 | 107 | 106 | 106 | 8 | 23 |
| GH 755 | 109 | 91 | 111 | 91 | 4 | 9 |

Table 2B-1 continued. Average yields of alfalfa varieties with three or more seedings with one or more harvest years' data (1967-1997) NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

| Variety | R-W-LEW YR1-2 | R-W-LEW YR3 | ALL YR1-2 | ALL YR3 | Test Sites [1] | Production Yrs1-3 [2] |
|--------------------|------------------|----------------|--------------|------------|-------------------|--------------------------|
| GH 766QP | 98 | — | 97 | — | 5 | 4 |
| GH 787 | 105 | — | 106 | 98 | 5 | 10 |
| Good as Gold | 107 | 99 | 110 | 117 | 7 | 17 |
| Green Field | 103 | 100 | 104 | 100 | 3 | 6 |
| Imperial | 112 | 103 | 112 | 103 | 5 | 8 |
| Iroquois | 104 | 98 | 106 | 99 | 10 | 26 |
| Jade | 116 | 109 | 113 | 118 | 6 | 16 |
| Lactator | 106 | 97 | 106 | 97 | 3 | 5 |
| aser | 115 | 102 | 112 | 102 | 3 | 7 |
| Legend | 98 | 102 | 96 | 99 | 6 | 18 |
| LegenDairy | 114 | — | 111 | 100 | 4 | 9 |
| Magnum III | 110 | 110 | 110 | 114 | 9 | 25 |
| Magnum III-Wet | 111 | — | 111 | — | 5 | 10 |
| Magnum IV | 108 | 107 | 109 | 107 | 6 | 13 |
| Max 329 | 101 | — | 103 | — | 7 | 10 |
| Multi-plier | 109 | 99 | 103 | 101 | 16 | 37 |
| MultiKing 1 | 101 | — | 105 | 116 | 5 | 13 |
| MultiQueen | — | — | 111 | — | 3 | 5 |
| Oneida (ck) | 103 | — | 103 | — | 8 | 12 |
| Oneida VR (ck) | 102 | — | 101 | — | 12 | 12 |
| Ovation | 103 | 98 | 107 | 98 | 3 | 7 |
| Pacesetter | 104 | — | 107 | 93 | 3 | 7 |
| Persist | 113 | — | 113 | — | 5 | 9 |
| Profit | 107 | 111 | 105 | 107 | 13 | 32 |
| Proof | 116 | — | 98 | 105 | 5 | 10 |
| Quantum | 107 | 99 | 110 | 99 | 4 | 9 |
| RFV-2000 | 106 | — | 105 | — | 4 | 8 |
| Rustler II | 112 | — | 112 | — | 4 | 6 |
| Saranac | 104 | 98 | 104 | 99 | 23 | 64 |
| Spredor 3 (ck) | 94 | — | 95 | — | 13 | 11 |
| Sterling | 106 | — | 104 | 104 | 6 | 13 |
| Surpass | 112 | 108 | 110 | 107 | 7 | 19 |
| Target | 107 | 108 | 106 | 106 | 7 | 21 |
| Target II | 110 | 84 | 109 | 96 | 4 | 10 |
| TMF Generation | 109 | — | 100 | — | 5 | 6 |
| TMF Multi-plier II | — | — | — | — | 3 | 3 |
| Total+Z | 112 | — | 100 | — | 3 | 6 |
| Trident II | 105 | 94 | 106 | 112 | 8 | 20 |
| Venture | 103 | 98 | 103 | 98 | 3 | 7 |
| Voyager II | 110 | — | 109 | — | 7 | 11 |
| Webfoot MPR | 102 | — | 103 | — | 5 | 9 |
| Wetland | 104 | — | 104 | — | 4 | 6 |
| Winterstar | 110 | — | 107 | 128 | 8 | 9 |
| WL 226 | 100 | 99 | 108 | 116 | 3 | 9 |
| WL 252 HQ | 107 | — | 104 | — | 6 | 9 |

Table 2B-1 continued. Average yields of alfalfa varieties with three or more seedings with one or more harvest years data (1967-1997) NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

| Variety | R-W-LEW YR1-2 | R-W-LEW YR3 | ALL YR1-2 | ALL YR3 | Test Sites [1] | Production Yrs1-3 [2] |
|-----------|------------------|----------------|--------------|------------|-------------------|--------------------------|
| WL 320 | 109 | 110 | 109 | 105 | 6 | 18 |
| WL 322 HQ | 94 | 104 | 99 | 112 | 3 | 9 |
| WL 323 | 105 | 97 | 107 | 97 | 6 | 12 |
| WL 324 | 111 | — | 111 | — | 5 | 4 |
| Wrangler | 106 | 107 | 103 | 101 | 8 | 23 |
| Zenith | 107 | — | 107 | 111 | 8 | 17 |

Table 2C-1. Average yields of alfalfa varieties with less than three seedings with one or more harvest years data (1967-1997) and NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

Note Key:

[1] Each seeding year in any location counts as one Test Site.

[2] Total production years (after seeding year) for any location with reliable data. Two production years needed for YR1-2 data. (Seed years or production years that winterkilled or otherwise developed unacceptably variable stands are excluded.)

Locations: R-W-LEW=Rosemount-Waseca-Lewiston, ...ALL test sites.

Varieties in this table have fewer tests and CANNOT be reliably compared with those in Table 2B.

| Variety | R-W-LEW YR1-2 | R-W-LEW YR3 | ALL YR1-2 | ALL YR3 | Test Sites [1] | Production Yrs1-3 [2] |
|------------------|------------------|----------------|--------------|------------|-------------------|--------------------------|
| 3324 | — | — | — | — | 1 | 1 |
| 9326 | — | — | — | — | 2 | 2 |
| Allegro | 109 | 98 | 95 | 98 | 2 | 5 |
| AmeriGraze 401+Z | — | — | — | — | 1 | 1 |
| AmeriGuard 301 | — | — | — | — | 3 | 0 |
| Baralfa 32 IQ | — | — | — | — | 1 | 0 |
| Big Horn | 101 | — | 101 | — | 2 | 3 |
| Bolt ML | 111 | 94 | 111 | 94 | 1 | 3 |
| Cut 'N' Graze | — | — | — | — | 1 | 1 |
| DK 140 | — | — | — | — | 4 | 0 |
| DK 141 | — | — | — | — | 4 | 0 |
| DK 142 | 109 | — | 109 | — | 2 | 2 |
| FEAST | — | — | — | — | 1 | 0 |
| Gateway | — | — | — | — | 2 | 0 |
| GH 757 | — | — | — | — | 1 | 0 |
| GH 777 | 110 | 99 | 110 | 99 | 1 | 3 |
| GH 797 | 94 | — | 96 | 142 | 2 | 5 |
| Jade II | — | — | — | — | 2 | 1 |
| MagnaGraze | 109 | — | 109 | — | 2 | 4 |
| Nemesis | — | — | — | — | 4 | 1 |

Table 2C-1 continued. Average yields of alfalfa varieties with less than three seedings with one or more harvest years data (1967-1997) and NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

| Variety | R-W-LEW YR1-2 | R-W-LEW YR3 | ALL YR1-2 | ALL YR3 | Test Sites [1] | Production Yrs1-3 [2] |
|------------|------------------|----------------|--------------|------------|-------------------|--------------------------|
| Rhino | — | — | — | — | 3 | 1 |
| Sierra | 112 | — | 112 | — | 1 | 2 |
| Spirit | — | — | — | — | 2 | 2 |
| Stampede | — | — | — | — | 2 | 2 |
| Synergy | 103 | -- | 103 | -- | 1 | 2 |
| Teton | -- | -- | 102 | 102 | 1 | 3 |
| TMF 421 | — | — | — | — | 2 | 0 |
| Travois | -- | -- | 94 | 96 | 1 | 3 |
| Treasure | 105 | 104 | 105 | 104 | 1 | 3 |
| Vitro | — | — | — | — | 3 | 1 |
| Winterking | 102 | -- | 102 | -- | 1 | 2 |
| WL 325HQ | — | — | — | — | 4 | 2 |

Table 2A-2. Average yields of alfalfa varieties tested for Winter Survival Index (WSI) expressed as percentage of check varieties for all seedings (tests) with one or more harvest years (1967-1997). Average yield is years 1-2 after seeding and year 3 per test site. Sorted to match order in Table 2A-1.

Note Key:

[1] Winter Survival Index from joint Minnesota-Wisconsin trials (see Table 3).

Locations: M-C=Morris-Crookston, LAM=Lamberton, GR=Grand Rapids.

| Variety | WSI [1] | M-C YR1-2 | M-C YR3 | LAM YR1-2 | LAM YR3 | GR YR1-2 | GR YR3 |
|----------------------------------|------------|--------------|------------|--------------|------------|-------------|-----------|
| Checks (T/Ac 15%mc Hay) | — | 5.19 | 4.82 | 5.38 | 4.79 | 4.10 | 3.97 |
| Superior Winter Survival | | | | | | | |
| ABT 205 | 1.6 | 112 | — | 87 | — | — | — |
| Vernal (ck) | 1.8 | 100 | 100 | 100 | 100 | 100 | 100 |
| Very Good Winter Survival | | | | | | | |
| 5454 | 2.3 | 118 | — | 100 | — | 110 | 101 |
| 620 | 2.6 | 114 | — | 94 | — | — | — |
| Wintergreen | 2.5 | — | — | -- | — | 102 | 139 |
| Defiant | 2.3 | 111 | — | 98 | — | — | — |
| Avalanche+Z | 2.4 | 116 | — | 88 | — | — | — |
| Extend | 2.9 | — | — | -- | — | — | — |
| 5262 | 2.3 | 107 | 107 | 98 | 113 | 105 | 116 |
| Notice | 2.6 | 119 | — | 94 | — | — | — |
| MP 2000 | 2.7 | 114 | — | 87 | — | — | — |
| Garst 645 | 2.8 | 110 | 129 | 103 | 151 | — | — |

Table 2A-2 continued. Average yields of alfalfa varieties tested for Winter Survival Index (WSI) expressed as percentage of check varieties for all seedings (tests) with one or more harvest years (1967-1997). Average yield is years 1-2 after seeding and year 3 per test site. Sorted to match order in Table 2A-1.

| Variety | WSI [1] | M-C YR1-2 | M-C YR3 | LAM YR1-2 | LAM YR3 | GR YR1-2 | GR YR3 |
|-----------------------------|------------|--------------|------------|--------------|------------|-------------|-----------|
| ABT 405 | 2.6 | 115 | — | 92 | — | — | — |
| DK 127 | 2.6 | 110 | — | 88 | — | — | — |
| Rushmore | 2.7 | 117 | — | 93 | — | 94 | 100 |
| Ranger | 2.9 | 125 | 117 | 97 | 99 | — | — |
| Complete | 2.7 | — | — | 91 | — | — | — |
| Innovator+Z | 2.3 | — | — | 87 | — | — | — |
| Legendairy 2.0 | 2.8 | — | — | — | — | — | — |
| MultiMist | 2.7 | — | — | — | — | — | — |
| Forerunner | 2.7 | — | — | — | — | — | — |
| Exceed | 2.8 | — | — | — | — | — | — |
| Rainier | 2.9 | — | — | — | — | — | — |
| Good Winter Survival | | | | | | | |
| Aspen | 3.2 | — | — | — | — | — | — |
| Ciba 2888 | 3.2 | 128 | — | 104 | — | — | — |
| 5312 | 3.0 | 112 | — | 99 | — | 103 | 116 |
| GH 767 | 3.0 | — | — | — | — | 93 | 115 |
| UltraLeaf 87 | 3.2 | — | — | — | — | 106 | 90 |
| Dart | 3.2 | 104 | 113 | 104 | 112 | 109 | 108 |
| Viking 1 | 3.0 | 107 | — | 90 | — | 112 | 106 |
| Lightning | 3.3 | 121 | — | 77 | — | — | — |
| Guardian | 3.0 | 105 | — | 80 | — | — | — |
| SuperCuts | 3.4 | 112 | — | 76 | — | — | — |
| Fortress | 3.8 | 80 | 98 | 106 | 89 | 103 | 98 |
| 8498 | 3.1 | — | — | — | — | — | — |
| Ace | 3.1 | — | — | — | — | — | — |
| Columbia 2000 | 3.1 | — | — | — | — | — | — |

Table 2B-2. Average yields of alfalfa varieties with three or more seedings with one or more harvest years data (1967-1997) NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

Notes:

Locations: M-C=Morris-Crookston, LAM=Lamberton, GR=Grand Rapids.

| Variety | M-C YR1-2 | M-C YR3 | LAM YR1-2 | LAM YR3 | GR YR1-2 | GR YR3 |
|---------|--------------|------------|--------------|------------|-------------|-----------|
| 120 | 103 | 107 | 103 | — | 112 | 107 |
| 2555ML | 104 | — | 110 | — | — | — |
| 3452ML | 105 | — | 107 | — | — | — |
| 5246 | 114 | — | 99 | — | 102 | 119 |
| 630 | 102 | 100 | 107 | 107 | 99 | 112 |

Table 2B-2 continued. Average yields of alfalfa varieties with three or more seedings with one or more harvest years data (1967-1997) NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

| Variety | M-C YR1-2 | M-C YR3 | LAM YR1-2 | LAM YR3 | GR YR1-2 | GR YR3 |
|----------------|--------------|------------|--------------|------------|-------------|-----------|
| 631 | 119 | — | 97 | — | — | — |
| A-295 | — | — | — | — | — | — |
| A-395 | — | — | — | — | — | — |
| Achieva | 111 | — | — | — | — | — |
| Affinity+Z | 111 | — | 98 | — | — | — |
| Agate | 97 | 101 | 100 | 100 | 89 | 96 |
| Aggressor | 103 | 109 | 102 | 126 | 99 | 107 |
| Alfagraze | 97 | 106 | 101 | 117 | 103 | 94 |
| AlfaStar | — | — | 99 | — | — | — |
| ALPHA 2001 | 122 | — | 81 | — | — | — |
| Alpine | 95 | 120 | 112 | 123 | — | — |
| Apollo Supreme | 90 | 103 | 100 | 99 | 107 | 112 |
| Arrow | 105 | 107 | 108 | 114 | 110 | 103 |
| Award | — | — | — | — | — | — |
| BANQUET | — | — | — | — | — | — |
| Blazer XL | 101 | 98 | 105 | 103 | — | — |
| Bounty | 118 | — | — | — | — | — |
| Break-Thru | 88 | 97 | 102 | 93 | 103 | 93 |
| Ciba 2444 | — | — | — | — | — | — |
| Crown II | 96 | 107 | 110 | 124 | — | — |
| Crystal | 104 | 112 | 117 | 144 | — | — |
| Dawn | 107 | 112 | — | — | 94 | 98 |
| Demand | — | — | 94 | — | — | — |
| Depend+EV | — | — | — | — | 103 | 130 |
| Dividend | 114 | -- | 88 | -- | 113 | 101 |
| DK 122 | 102 | 108 | 107 | 120 | 104 | 102 |
| DK 133 | 108 | 115 | 109 | -- | 110 | 101 |
| Dominator | — | — | 99 | — | — | — |
| Eliminator | 99 | 98 | — | — | 102 | 102 |
| Empire | 112 | -- | 87 | — | — | — |
| Enhancer | 116 | — | 102 | — | — | — |
| Envy | 101 | 112 | 102 | 110 | — | — |
| Evolution | 104 | — | — | — | 98 | 105 |
| Garst 636 | 105 | 108 | 101 | 105 | 103 | 102 |
| GH 755 | 117 | — | — | — | — | — |
| GH 766QP | — | — | — | — | — | — |
| GH 787 | — | — | — | — | 109 | 98 |
| Good as Gold | 113 | 117 | 104 | 135 | 108 | 115 |
| Green Field | — | — | 106 | — | — | — |
| Imperial | — | — | — | — | — | — |
| Iroquois | 105 | 103 | 100 | 99 | 111 | 96 |
| Jade | 116 | 121 | 107 | 131 | 109 | 108 |
| Lactator | — | — | — | — | — | — |
| Laser | 117 | — | 103 | — | — | — |
| Legend | 89 | 98 | 101 | 91 | 101 | 103 |

Table 2B-2 continued. Average yields of alfalfa varieties with three or more seedings with one or more harvest years data (1967-1997) NOT tested for Winter Survival Index, expressed as percentage of check varieties. Average yield is years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

| Variety | M-C YR1-2 | M-C YR3 | LAM YR1-2 | LAM YR3 | GR YR1-2 | GR YR3 |
|--------------------|--------------|------------|--------------|------------|-------------|-----------|
| LegenDairy | — | — | — | — | 104 | 100 |
| Magnum III | 106 | 103 | 116 | 132 | 104 | 108 |
| Magnum III-Wet | 111 | — | — | — | — | — |
| Magnum IV | 114 | — | 107 | — | — | — |
| Max 329 | 108 | — | 107 | — | — | — |
| Multi-plier | 101 | 109 | 98 | 83 | 100 | 100 |
| MultiKing 1 | 109 | 119 | 117 | 141 | 96 | 87 |
| MultiQueen | 127 | — | 102 | — | — | — |
| Oneida (ck) | 111 | — | 91 | — | — | — |
| Oneida VR (ck) | 110 | — | 85 | — | — | — |
| Ovation | 113 | — | — | — | — | — |
| Pacesetter | — | — | — | — | 112 | 93 |
| Persist | 121 | — | 105 | — | — | — |
| Profit | 104 | 93 | 106 | 112 | 101 | 114 |
| Proof | 100 | — | 83 | — | 90 | 105 |
| Quantum | 118 | — | — | — | — | — |
| RFV-2000 | 107 | — | 101 | — | — | — |
| Rustler II | — | — | — | — | — | — |
| Saranac | 106 | 109 | 102 | 96 | — | — |
| Spredor 3 (ck) | — | — | — | — | — | — |
| Sterling | 119 | — | 91 | — | 94 | 104 |
| Surpass | 104 | 105 | 108 | 105 | 108 | 110 |
| Target | 108 | 102 | 108 | 114 | 100 | 99 |
| Target II | 111 | 106 | — | — | 105 | 97 |
| TMF Generation | 108 | — | 84 | — | — | — |
| TMF Multi-plier II | — | — | — | — | — | — |
| Total+Z | — | — | 94 | — | — | — |
| Trident II | 106 | 113 | 108 | 134 | 104 | 106 |
| Venture | — | — | — | — | — | — |
| Voyager II | 116 | — | 100 | — | — | — |
| Webfoot MPR | 108 | — | 100 | — | — | — |
| Wetland | — | — | — | — | — | — |
| Winterstar | — | — | — | — | 100 | 128 |
| WL 226 | 112 | 123 | 111 | 127 | — | — |
| WL 252 HQ | 99 | — | 107 | — | — | — |
| WL 320 | 106 | 102 | 112 | 105 | 112 | 102 |
| WL 322 HQ | 110 | 121 | 92 | 113 | — | — |
| WL 323 | 113 | — | 101 | — | — | — |
| WL 324 | — | — | — | — | — | — |
| Wrangler | 106 | 103 | 98 | 106 | 100 | 91 |
| Zenith | 108 | 105 | 107 | 117 | — | — |

Table 2C-2. Average yields of alfalfa varieties with less than three seedings with one or more harvest years data (1967-1996) and NOT tested for Winter Survival Index, expressed as percentage of Vernal. Average Yield: years 1-2 after seeding and year 3 per test site. Sorted alphabetically.

Note Key:

Locations: C-M=Crookston-Morris, LAM=Lamberton, GR=Grand Rapids

Varieties below have fewer tests and **cannot** be reliably compared with those in Table 2B.

| Variety | C-M YR1-2 | C-M YR3 | LAM YR1-2 | LAM YR3 | GR YR1-2 | GR YR3 |
|------------------|--------------|------------|--------------|------------|-------------|-----------|
| 3324 | — | — | — | — | — | — |
| 9326 | — | — | — | — | — | — |
| Allegro | — | — | 80 | — | — | — |
| AmeriGraze 401+Z | — | — | — | — | — | — |
| AmeriGuard 301 | — | — | — | — | — | — |
| Baralfa 32 IQ | — | — | — | — | — | — |
| Big Horn | — | — | — | — | — | — |
| Bolt ML | — | — | — | — | — | — |
| Cut 'N' Graze | — | — | — | — | — | — |
| DK 140 | — | — | — | — | — | — |
| DK 141 | — | — | — | — | — | — |
| DK 142 | — | — | — | — | — | — |
| FEAST | — | — | — | — | — | — |
| Gateway | — | — | — | — | — | — |
| GH 757 | — | — | — | — | — | — |
| GH 777 | — | — | — | — | — | — |
| GH 797 | — | — | — | — | 99 | 142 |
| Jade II | — | — | — | — | — | — |
| MagnaGraze | — | — | — | — | — | — |
| Nemesis | — | — | — | — | — | — |
| Rhino | — | — | — | — | — | — |
| Sierra | — | — | — | — | — | — |
| Spirit | — | — | — | — | — | — |
| Stampede | — | — | — | — | — | — |
| Synergy | — | — | — | — | — | — |
| Teton | 102 | 102 | — | — | — | — |
| TMF 421 | — | — | — | — | — | — |
| Travois | 94 | 96 | — | — | — | — |
| Treasure | — | — | — | — | — | — |
| Vitro | — | — | — | — | — | — |
| Winterking | — | — | — | — | — | — |
| WL 325HQ | — | — | — | — | — | — |

Table 3. Winter Survival Index (WSI): 1997 winter survival results (joint Minnesota / Wisconsin trials).

Locations: A=Arlington, WI; LAN=Lancaster, WI; MA=Marshfield, WI; MO=Morris, MN; R=Rosemount, MN.

Winter Survival Index categories: 1=superior; 2=very good; 3=good; 4=adequate; 5=low; 6=none.

Planted in 1995. Rated during May, 1996. Check varieties: (ck).

| Variety | A | LAN | MA | MO | R | Mean |
|-----------------------|-----|-----|-----|-----|-----|------|
| Maverick (ck) | — | — | — | 1.0 | 1.0 | 1.0 |
| Norseman (ck) | 1.0 | 1.0 | 1.0 | — | — | 1.0 |
| Vernal (ck) | 1.9 | 1.7 | 2.0 | 1.8 | 1.9 | 1.9 |
| ZN 9531 | 1.8 | 2.4 | 1.5 | 2.6 | 2.3 | 2.1 |
| 526 (ck) | 2.1 | 2.4 | 2.1 | 2.1 | 2.0 | 2.2 |
| ZN 9530 | 1.9 | 2.0 | 1.9 | 3.1 | 2.0 | 2.2 |
| 3G61 | 1.8 | 2.3 | 2.0 | 2.6 | 2.0 | 2.3 |
| 3G54 | 2.1 | 2.7 | 3.0 | 2.9 | 2.2 | 2.3 |
| ZC 9525 | 2.2 | 2.9 | 1.8 | 2.9 | 2.3 | 2.4 |
| ZC 9524 | 2.0 | 2.8 | 1.9 | 3.0 | 2.3 | 2.4 |
| 4G66 | 2.0 | 3.3 | 2.1 | 2.9 | 1.9 | 2.4 |
| ZC 9348 | 2.1 | 2.9 | 2.6 | 3.0 | 2.0 | 2.4 |
| ZC 9420 | 2.4 | 2.9 | 1.9 | 2.8 | 2.4 | 2.5 |
| C/W-3304 | 2.4 | 2.9 | 2.0 | 3.0 | 2.0 | 2.5 |
| ZC 9538 | 2.3 | 3.0 | 2.2 | 2.9 | 2.2 | 2.5 |
| 3G56 | 2.3 | 3.2 | 1.9 | 2.9 | 2.5 | 2.6 |
| ZN 9533 | 2.2 | 3.0 | 3.6 | 2.5 | 2.5 | 2.6 |
| C/W-4429 | 2.4 | 2.9 | 2.0 | 3.0 | 2.3 | 2.6 |
| 620 | 2.6 | 2.9 | 2.0 | 3.2 | 2.3 | 2.6 |
| Forerunner | 2.8 | 3.0 | 2.0 | 3.0 | 2.8 | 2.7 |
| Complete | 2.3 | 3.3 | 2.2 | 3.1 | 2.3 | 2.7 |
| 3L22 | 2.2 | 2.9 | 2.2 | 3.2 | 2.3 | 2.7 |
| 4G75 | 2.7 | 3.0 | 1.8 | 3.3 | 2.5 | 2.7 |
| ZM 9421 | 2.2 | 2.8 | 4.1 | 2.9 | 2.7 | 2.7 |
| ZM 9322 | 2.1 | 3.6 | 3.4 | 3.0 | 2.7 | 2.8 |
| Exceed | 2.6 | 2.9 | 2.1 | 3.2 | 2.8 | 2.8 |
| LegenDairy 2.0 | 2.7 | 3.6 | 2.0 | 2.7 | 2.5 | 2.8 |
| DK 127 | 2.5 | 3.2 | 3.5 | 3.1 | 2.4 | 2.8 |
| Extend | 2.6 | 3.3 | 3.4 | 3.1 | 2.6 | 2.9 |
| ZM 9539 | 2.7 | 3.3 | 3.3 | 2.9 | 2.7 | 2.9 |
| Rainier | 2.5 | 3.4 | 3.3 | 3.2 | 2.6 | 2.9 |
| Ranger (ck) | 2.9 | 2.7 | 2.3 | 2.8 | 3.2 | 2.9 |
| GH 767 | 2.8 | 3.3 | 2.2 | 3.2 | 3.0 | 3.0 |
| Ace | 3.5 | 3.6 | 2.7 | 3.0 | 2.5 | 3.1 |
| 8498 | 3.0 | 3.9 | 2.9 | 3.3 | 2.4 | 3.1 |
| Dart (ck) | 3.2 | 3.3 | 3.4 | 3.2 | 2.7 | 3.1 |
| Aspen | 2.9 | 3.6 | 2.6 | 3.4 | 2.9 | 3.2 |
| WL 92-28 | 3.1 | 3.1 | 4.1 | 3.6 | 2.5 | 3.2 |
| Fortress (ck) | 3.4 | 3.7 | 4.9 | 3.9 | 2.9 | 3.8 |
| Archer (ck) | 5.0 | 4.4 | 2.8 | 4.3 | 4.8 | 4.3 |
| G-2852 (ck) | 4.1 | 4.7 | 4.9 | 4.0 | 4.4 | 4.4 |
| Southern Special (ck) | 5.5 | 5.3 | 5.0 | 5.2 | 5.2 | 5.2 |
| Moapa 69 (ck) | 6.0 | 6.0 | 5.7 | 6.0 | 6.0 | 5.9 |
| Cuf 101 (ck) | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 | 6.0 |

Table 4. Forage quality and milk per acre of alfalfa varieties, as percent of check entry. Sorted alphabetically.

Note Key:

[1] Varieties listed include joint Minnesota-Wisconsin quality trials (1995-97), plus varieties from prior Minnesota quality trials that are currently marketed in Minnesota.

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

[3] Milk per acre uses season average quality and yield at Rosemount, MN.

[4] Milk per acre uses season average quality and yield at Arlington, WI.

[5] Checks: Vernal until 1994; Vernal and WL322HQ for 1995-97 seed years.

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

* Not significantly different from highest variety in trial.

SY=Seed Year; PY=Production Year.

| Variety [1] | Minnesota/Wisconsin SY 1991-95 PY 1992-96 | | | Minnesota SY 1996 PY 1997 | | Wisconsin SY 1996 PY 1997 | | Wisconsin SY 1997 PY 1997 | |
|----------------|---|---------|---|---------------------------------|----------------|---------------------------------|----------------|---------------------------------|---------|
| | RFV [2] | Milk/Ac | N | RFV | Milk/Ac [3] | RFV | Milk/Ac [4] | RFV | Milk/Ac |
| 5246 | 104 | 106 | 2 | — | — | — | — | — | — |
| 5312 | — | — | 0 | — | — | — | — | — | — |
| 5454 | 102 | 105 | 1 | — | — | — | — | — | — |
| 630 | 107 | 109 | 1 | — | — | — | — | — | — |
| 8498 | — | — | 0 | 104* | 109* | 100 | 126* | — | — |
| 9326 | — | — | 0 | 106* | 107* | 103 * | 119* | — | — |
| ABT 205 | — | — | 0 | 102 | 103* | 101 | 116* | — | — |
| Agate | 108 | 104 | 2 | — | — | — | — | — | — |
| Avalanche+Z | — | — | 0 | — | — | — | — | — | — |
| Award | — | — | 0 | — | — | — | — | 108 | 108 |
| Baralfa 32 IQ | — | — | 0 | — | — | — | — | 110* | 112 |
| Bounty | — | — | 0 | — | — | — | — | — | — |
| Ciba 2888 | 102 | 112 | 2 | — | — | — | — | — | — |
| Dart | 106 | 99 | 1 | — | — | — | — | — | — |
| Dawn | 102 | 110 | 1 | — | — | — | — | — | — |
| Dividend | 108 | 104 | 1 | — | — | — | — | — | — |
| DK 122 | 104 | 106 | 3 | — | — | — | — | — | — |
| DK 127 | 105 | 115 | 3 | 108* | 105* | 103* | 116* | 108 | 122* |
| DK 133 | 105 | 106 | 3 | 100 | 96 | 103* | 120* | — | — |
| DK 140 | — | — | 0 | — | — | — | — | 106 | 116* |
| DK 141 | — | — | 0 | — | — | — | — | 102 | 119* |
| Dominator | 105 | 98 | 1 | — | — | — | — | — | — |
| Exceed | — | — | 0 | 102* | 107* | 102 | 121* | — | — |
| Extend | — | — | 0 | 103* | 100* | 102 | 121* | — | — |
| Garst 645 | 106 | 105 | 1 | — | — | — | — | — | — |
| GH 755 | 108 | 102 | 1 | — | — | — | — | — | — |
| GH 766QP | 102 | 100 | 1 | — | — | — | — | 104 | 118* |
| GH 767 | 103 | 111 | 2 | 108* | 99 | 106* | 115* | 101 | 115* |
| GH 787 | 103 | 110 | 2 | 106* | 98 | 108* | 118* | — | — |
| Good As Gold | 105 | 102 | 1 | — | — | — | — | — | — |

Table 4 continued. Forage quality and milk per acre of alfalfa varieties, as percent of check entry. Sorted alphabetically.

| Variety [1] | Minnesota/Wisconsin SY 1991-95 PY 1992-96 | | | Minnesota SY 1996 PY 1997 | | Wisconsin SY 1996 PY 1997 | | Wisconsin SY 1997 PY 1997 | |
|-----------------------|---|---------|-----|---------------------------------|----------------|---------------------------------|----------------|---------------------------------|---------|
| | RFV [2] | Milk/Ac | N | RFV | Milk/Ac [3] | RFV | Milk/Ac [4] | RFV | Milk/Ac |
| Imperial | 102 | 109 | 1 | — | — | — | — | — | — |
| Innovator +Z | 103 | 105 | 2 | — | — | — | — | — | — |
| LegenDairy | 110 | 104 | 1 | — | — | — | — | — | — |
| Lightning | 101 | 112 | 2 | — | — | — | — | — | — |
| Magnum III | 102 | 105 | 1 | — | — | — | — | — | — |
| Magnum III-Wet | 111 | 102 | 1 | — | — | — | — | — | — |
| Magnum IV | 99 | 102 | 1 | — | — | — | — | — | — |
| Max 329 | — | — | 0 | 104* | 100* | 104* | 120* | — | — |
| Multiking 1 | 109 | 102 | 3 | — | — | — | — | — | — |
| Nemesis | — | — | 0 | — | — | — | — | 104 | 117* |
| Oneida | 104 | 106 | 2 | — | — | — | — | — | — |
| Profit | 109 | 103 | 1 | — | — | — | — | — | — |
| Rainier | — | — | 0 | 104 | 104* | 103* | 116* | — | — |
| RFV-2000 | 108 | 106 | 1 | — | — | — | — | — | — |
| Rushmore | 98 | 105 | 1 | — | — | — | — | — | — |
| Saranac | — | — | 0 | — | — | — | — | — | — |
| Sierra | 103 | 109 | 1 | — | — | — | — | — | — |
| Spirit | — | -- | 0 | 101 | 104* | 96 | 124* | — | — |
| Sterling | 102 | 106 | 1 | — | — | — | — | — | — |
| Ultraleaf 87 | 102 | 108 | 2 | — | — | — | — | — | — |
| Vernal | 99 | 98 | 6 | 98 | 100 | 100 | 100 | 98 | 102 |
| Viking 1 | 106 | 103 | 1 | — | — | — | — | — | — |
| Winterstar | — | — | 0 | — | — | — | — | 104 | 111 |
| WL 252 HQ | 104 | 109 | 3 | — | — | — | — | — | — |
| WL 322 HQ | 105 | 105 | 5 | 102 | 100 | — | — | 102 | 99 |
| Vernal /Checks [5] | 148 | 11782 | 6 | 139 | 8567 | 179 | 8129 | 189 | 5015 |
| Test Mean | 153 | 12404 | 6 | 142 | 8826 | 184 | 9635 | 198 | 5833 |
| LSD .05 | 5 | 9 | 5 | 15 | 7 | 13 | | | |
| CV% [6] | 3.4 | 6.1 | 3.2 | 8.7 | 4.4 | 7.9 | | | |

Table 5. Forage seed sources for 1998 production. Listed alphabetically; numbers keyed to Table 1.

- 1 Agassiz Seed & Supply, 445 7th St. NW, West Fargo ND 58078; 701-282-8118
- 2 AgriBioTech, 2700 Sunset, Las Vegas NV 89012; 702-798-1969
- 3 AgriPro Seed Co., Inc., 824 2nd St. South, Brookings SD 57006; 800-658-5526
AgriPro Seed Co., Inc., PO Box 2962, Shawnee Mission KS 66201; 913-384-4940
- 4 AgServices, 1395 Roberts Road, Hutchinson MN 55350; 320-587-8972
- 5 AgVenture Central, Box 296, Madison Lake MN 56063; 507-243-3232
AgVenture West, Box 184, Jeffers MN 56145; 507-628-4929
AgVenture West Central, Rt. 2 Box 134, Olivia MN 56277; 320-523-2250
- 6 AgVenture East, Rte 2, Box 58, Kasson MN 55944; 800-657-4890
- 7 Albert Lea Seedhouse, 1414 West Main/PO Box 127, Albert Lea MN 56007; 507-373-3161

Table 5 continued. Forage seed sources for 1998 production. Listed alphabetically; numbers keyed to Table 1.

-
- 8 Allied Seed Cooperative, PO Box 945, Angola IN 46703; 800-813-5025
- 9 America's Alfalfa, PO Box 2962, Shawnee Mission KS 66201; 913-384-4940
- 10 Andrews Seed Co., 580 S. Oregon, Ontario OR 97914; 541-889-9109
-
- 11 Asgrow Seed Company, 2605 East Kilgore Rd., Kalamazoo MI 49009; 616-384-5500
- 12 Barenbrug Midwest, 1506 W. 3rd. St., Vinton IA 52349; 888-470-5569, 319-472-5569
Barenbrug USA, P.O. Box 239, Tangent OR 97389; 541-926-5801
- 13 Bio Plant Research, P.O. Box 320, Camp Point IL 62320; 800-593-7708
- 14 Brown Seed Farms, P.O. Box 186/720 St. Croix St., Prescott WI 54021; 715-262-4331
- 15 Brunner Seed , W3850 U.S. Hwy 10, Durand WI 54736; 715-672-5887
-
- 16 Callahan Seeds, 1122 E 169th St., Westfield IN 46074; 317-896-5551
- 17 Cargill Hybrid Seeds, Rte 1, Box 56. Plainfield MN 55964; 612-742-6743
- 18 Croplan Genetics, PO Box 64089, Cenex/Land O' Lakes, St. Paul MN 55164; 612-451-5490
- 19 Crow's Hybrids, PO Box 306 Hwy 1 N., Milford IL 60953; 815-889-4151
- 20 Dahlman Seed Co., Rte 1 Box 116, Dassel MN 55325; 320-275-2527
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- 21 Dairyland Seed Co., PO Box 958, West Bend WI 53095; 800-236-0163
- 22 DEKALB Genetics Corp., 7665 Commerce Way, Suite 101, Eden Prairie MN 55344;
612-934-0134
- 23 DEKALB Genetics Corp., 3100 Sycamore Rd., Dekalb IL 60115; 815-758-9323
- 24 Discount Farm Center, PO Box 84, West Hwy 212, Watertown SD 57201; 605-886-5888
- 25 Elk Mound Seed, PO Box 187, 308 Railroad Ave, Elk Mound WI 54739; 715-879-5556
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- 26 Fontanelle Hybrids, 10981 8th St, Fontanelle NE 68044; 402-721-1410
- 27 Fred Gutwein & Sons, RR 1, Box 40, Francesville IN 47946; 219-567-9141
- 28 Garst Seed Co., P.O. Box 7790, Madison WI 53707; 608-249-8977
- 29 Geertson Seed Farm, 1665 Burrough Rd, Adrian OR 97901; 541-339-3768
- 30 Golden Harvest Seeds, 27420 137th Ave. North, Cordova IL 61242; 309-654-2234
Golden Harvest Seeds, PO Box A, 100 J.C. Robinson Blvd., Waterloo NE 68069;
402-779-2531
Golden Harvest Seeds, 220 N. Eldorado Rd, Ste E, Bloomington IL 61704; 800-610-7333
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- 31 Great Lakes Hybrids, RR. 6 Box 6600, Mankato MN 56001; 507-625-1103
- 32 Great Plains Research Co. Inc., 3624 Kildaire Farm Rd, Apex NC 27502; 919-362-1583
- 33 Harvest States Coop/GTA Feeds, 2401 Hardison Dr. PO Box 1624, Norfolk NE 68702;
402-371-2040
- 34 Hoegemeyer Hybrids, Rte 2, Box 126, Hooper NE 68031; 402-654-3399
- 35 Hoffman Seeds, 144 Main St., Landisville PA 17538; 717-898-2261
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- 36 International Seeds Inc., P.O. Box 168, Halsey OR 97348; 541-369-2251
- 37 Interstate Payco Seed Co., Box 338, West Fargo ND 58078; 701-282-7338
- 38 Jung Seed Genetics, 1229 NW 41st St, Rochester MN 55901; 507-288-1930
Jung Seed Genetics, 335 South High St., Randolph WI 53956; 800-242-1855
- 39 Kaltenberg Seed Farms Inc., 20155 Biscayne Ave. West, Farmington MN 55024;
612-463-8997
Kaltenberg Seed Farms Inc., PO Box 278, Waunakee WI 53597; 800-383-3276
- 40 L.L. Olds Seed Co., Box 7790, Madison WI 53707; 800-356-7333, 608-249-9291
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- 41 La Crosse Seed Corp., PO Box 187, LaCrosse WI 54601; 608-781-4848
- 42 Lemke Seeds, 10220 N. Granville Rd., Mequon WI 53092; 414-242-2647
- 43 LG Seeds, PO Box 216, 925 Dexter, Prescott WI 54021; 800-637-2887

Table 5 continued. Forage seed sources for 1998 production. Listed alphabetically; numbers keyed to Table 1.

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- 44 Mallard Seed, PO Box 637, Plainview MN 55964; 507-534-2300
 45 MBS Inc., 225 West 1st St., Story City IA 52101; 515-733-5274
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- 46 Midwest Seed Genetics, PO Box 518, 23751 Hwy 30 E., Carroll IA 51401; 712-792-6691
 47 Mycogen Seeds, P.O. Box 21428, 1340 Corp. Cntr. Curve, St Paul MN 55121; 612-405-5973
 48 NC+ Hybrids, RR 2, Box 52, Sanborn MN 56083; 507-648-3378
 NC+ Hybrids, Box 4408, Lincoln NE 68504; 402-467-2517
 49 North-Gro Seeds, 613 N. Randolph St., Cuba City WI 53807; 608-744-7333
 50 Novartis Seeds, PO Box 959, Minneapolis MN 55440; 612-593-7261
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- 51 Patriot Seed, Inc., PO Box 97, 208 South Warrell, Bowen IL 62316; 800-643-1518
 52 Peterson Seed Co., Inc., Box 346, Savage MN 55436; 800-328-5898
 53 Pioneer Hi-Bred Int'l, Inc., 130 Willmar Ave. SE, Willmar MN 56201; 320-235-7420
 54 Premium Seed Co., Inc., 7800 E. State Hwy 101, Shakopee MN 55379; 612-496-1783
 55 Producers Hybrids, Inc., 12125 Mississippi Dr., Champlin MN 55316; 800-323-8605
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- 56 R.J. Hunt Seed Co., RR 1, Box 112, Wadena MN 56482; 218-631-4190
 57 Renk Seed Company, 6800 Wilburn Rd., Sun Prairie WI 53590; 608-837-7351
 58 Seed Mart, Inc., PO Box 126, 925 Dexter St., Prescott WI 54021; 715-282-4430
 59 Spangler Seeds, 803 W. Racine St., Jefferson WI 53549; 414-674-4606
 60 Specialty Seeds, 26787 Hillhaven Drive, Cold Spring MN 56320; 612-685-4520
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- 61 Terning Seeds, Inc., 15385-60th St. NW, Cokato MN 55321; 320-286-2168
 62 Top Farm Hybrids, 17177 60th St SW, Cokato MN 55321; 320-286-5516
 63 Trelay, Inc., 11623 Hwy 80 N, Livingston WI 53554; 800-421-0397
 64 Tri-State Seed, Rte 1 Box 354, Sleepy Eye MN 56085; 507-794-3078
 65 Twin Cities Seeds, 7265 Washington Ave South, Edina MN 55439; 612-944-7105
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- 66 United Ag Products/MN IA Seed Div., PO Box 55 Kasota, MN 56050; 800-722-2274
 67 W-L Research, Inc., 349 1/2 Duck Lake Ave., Madison Lake MN 56063; 507-243-3660
 68 Wensman Seed Co., 102 Aldrich Ave. S.E. Box 190, Wadena MN 56482; 218-631-2954
 69 Werner Farm Seeds, 3104 Millersburg Blvd., Dundas MN 55019; 507-645-7995
 70 Ziller Seed Co., Inc., RR 1, Box 122, Bird Island MN 55310; 320-365-3674
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Alfalfa Planting Rate and Date

Rate is based on normal seedbeds and on normal size, good quality seed. Rate used can vary greatly depending on seed cost, desired stand, expected mortality, emerging ability, seed weight, seed germination, seedbed condition, depth of planting and planting equipment. Weight given is the most widely accepted in the U.S.

| Crop Use | Bushel Weight (pounds) | Seeds/pound (number) | Rate/acre (pounds) | Rate (seeds) | Planting Date |
|------------|------------------------|----------------------|--------------------|----------------|---------------------------|
| Alone | 60 | 199,000 | 11 | 50/square foot | Early spring to August 10 |
| With grass | | | 7 | 32/square foot | |
