



Alfalfa

P.R. Peterson, C.C. Sheaffer, J. Larson, D. Swanson and J. L. Halgerson

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 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/ufwforage/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.

Disease Resistance

Alfalfa root and crown diseases occur in most Minnesota soils. The most important diseases are bacterial wilt, Phytophthora root rot; Fusarium wilt, anthracnose, Verticillium wilt and Aphanomyces root rot (races 1 and 2). Plant resistance for all six diseases is widely available, except for Aphanomyces race 2 for which only a few 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
			2005	2004	2-Year Total	2004 Seeding, Harvest Year	2005 Seeding, Harvest Year	
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-Years, Average
			2005	2004	2-Year Total	2004 Seeding ₁	2004 Seeding ₂	
						2003 Seeding, Harvest Years	Harvest Year	
<i>Checks, Tons/Ac as Hay</i>			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				4-Year Total	2003 Seeding, Harvest Years			All Site-Years, Average
			2005	2004	2003	2002		2005	2004	2-Year Total	
<i>Checks, Tons/Ac as Hay</i>			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							2004 Seeding, Harvest Year
			2002 Seeding, Harvest Years				2003 Seeding, Harvest Years			2005
			3-Year Total			2-Year Total				
			2005	2004	2003	2005	2004			
<i>Checks, Tons/Ac as Hay</i>			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.	Maker	WSI	Grand Rapids			All Site-Years Average
			2003 Seeding, Harvest Years			
			2005	2004	2-Year Total	
<i>Checks, Tons/Ac as Hay</i>			<i>4.3</i>	<i>5.5</i>	<i>9.9</i>	<i>6.7</i>
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	Pfizer 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	Lamberton	Stearns County	All Site-Years Average
			2005 Seeding, Harvest Year	2005 Seeding, Harvest Year	2005 Seeding, Harvest Year	
			2005	2005	2005	
<i>Checks, Tons/Ac as Hay</i>			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.

Variety	Winter Survival Index *				Mean
	Rosemount, MN	South Shore, SD	Arlington, WI	Lancaster, WI	
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 Tons/DM Acre	Milk, (%) ^b		RFQ ^c Index	CP ^c , % DM	NDF ^c , % DM	NDFD ^d , % NDF
		Lb/Acre	Lb/Ton				
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 Ton/ Acre	Milk, (%) ^a		RFQ ^b Index	CP ^b , % DM	NDF ^b , % DM	NDFD ^c , % NDF
		Lb/Acre	Lb/Ton				
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.

PLH-Resistant Varieties	Average Yield At Two Locations, Tons Dry Matter/Acre			PLH Yield Index, % Above		Yield Tested In MN?
	Harvest 1	Harvest 2	Total	Susc. Checks	WSI	
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	Leqacy 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