



## Alfalfa

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**Locations of alfalfa trials**

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. The 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 are representative of the variable winter injury risk in different regions of Minnesota. Test locations include Rosemount (Dakota Co.), Potsdam (Olmsted Co.), Lambertson (Redwood Co.), St. Martin and Richmond (Stearns Co.), Underwood (Otter Tail Co.) and Grand Rapids (Itasca Co.); see locations map. In addition, some alfalfa varieties are tested for forage quality at Rosemount.

Yield results for alfalfa varieties tested in Minnesota yield trials (2003 to 2006 seeding years) are listed in tables 1 through 5. Varieties in current forage quality and potato leafhopper trials are listed in tables 6 and 7. Alfalfa variety seed marketers, their telephone numbers and web sites are provided in Table 8. Disease resistance information for alfalfa varieties is available on the web at [www.alfalfa.org](http://www.alfalfa.org).

### **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) data in tables 1 through 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 5. 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 this is no longer the case with modern varieties.

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 experience severe winters frequently. 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 through 5. 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 (2003 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; that is, 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 Minnesota 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 2005 and 2006 for a 2004 seeding). For long-term stands, choose varieties based on their performance through the third year after seeding (e.g. 2006 yield for 2003 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 2005 (three harvests) and 2006 (two harvests) in Minnesota are shown in table 5. Production year evaluation (first year after seeding) was done by analyzing each of three cuttings taken at late bud to one-tenth bloom stages of maturity. Data are expressed as milk per ton of forage, milk per acre and relative forage quality (RFQ).

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

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

### **Potato Leafhopper Tolerance**

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

Despite their potential for significant damage, PLH are not a problem in every harvest, year and region of Minnesota. PLH pressure is more consistent south and east of Minnesota. Consequently, in spring 2005 and spring 2006, new regional PLH-tolerant alfalfa yield trials

were established in collaboration with the University of Wisconsin, and Iowa State and Ohio State universities. Tests were seeded in Iowa and Ohio, which are areas of more consistent PLH pressure. Data from the 2005 and 2006 seedings 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 have been tested for yield and one for WSI.

### **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, but growing number of, varieties have known resistance. Variety resistance ratings for each disease are available on the web at [www.alfalfa.org](http://www.alfalfa.org). Varietal resistance to potato leafhopper and grazing are also available; see [www.alfalfa.org](http://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. Disease resistances can compensate for lesser levels of cold tolerance under some conditions. 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. Since 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 variety.

For web version of this report see:  
[www.maes.umn.edu/pubs.html](http://www.maes.umn.edu/pubs.html)

More detailed alfalfa variety performance results are available at the University of Minnesota forages, phone number is 612-625-8189, web address is  
<http://forages.cfans.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 yield as percentage of check varieties at Rosemount (Dakota County).**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.	Marketer	WSI	2003 Seeding, Harvest Years				2004 Seeding, Harvest Years			2005 Seeding, Harvest Year	All Site-Years Average
			2006	2005	2004	3-Year Total	2006	2005	2-Year Total	2006	
<i>Checks, Tons/Ac 15%mc Hay</i>			5.24	6.28	6.61	18.13	7.19	6.88	14.07	6.59	6.67
FSG 505	Allied	3.0	128	118	111	118	-	-	-	-	119
<b>WL 348 AP</b>	W-L	2.0	-	-	-	-	-	-	-	114	116
<b>GOLDLEAF</b>	Al. Lea/ Gold Co.	3.0	121	115	111	116	-	-	-	106	114
<b>DKA33-16</b>	DeKalb	-	107	113	107	109	-	-	-	-	114
L-311	Legacy	-	-	-	-	-	-	-	-	112	112
FSG 406	Allied	2.0	110	119	106	112	-	-	-	-	112
<b>POWER 4.2</b>	Power	-	112	111	106	109	-	-	-	-	112
EVERMORE	Allied	-	117	109	108	111	-	-	-	-	112
<b>LIGHTNING III</b>	Jung	2.5	-	-	-	-	119	105	112	-	112
<b>6415</b>	Garst	2.0	103	108	108	107	117	106	112	104	110
<b>6420</b>	Garst	-	112	110	110	111	-	-	-	106	110
STAMPEDE	Allied/Albert Lea	-	118	115	108	113	-	-	-	101	110
<b>PHIRST</b>	Bio Plant	-	101	113	105	107	-	-	-	-	110
ESCALADE	Allied/Albert Lea	-	-	-	-	-	-	-	-	110	110
<b>REBOUND 5.0</b>	Croplan	-	-	-	-	-	110	103	106	-	110
<b>GH 711</b>	Golden Harvest	2.0	107	114	113	112	-	-	-	-	110
VITRO II	North-Gro	2.0	109	113	107	110	-	-	-	-	110
MARVEL	Albert Lea	-	-	-	-	-	-	-	-	110	110
4S419	Mycogen	-	-	-	-	-	-	-	-	112	109
PERFECT	Grassland	-	111	108	106	108	-	-	-	-	109
<b>PHABULOUS II</b>	Trelay	-	94	99	106	100	104	106	105	-	108
<b>GENOA</b>	NK Brand	2.0	-	-	-	-	111	100	106	-	108
WL 357 HQ	W-L	2.0	108	115	111	112	-	-	-	-	108
<b>IGNITE</b>	Jung	-	101	104	101	102	-	-	-	-	108
FSG 351	Allied	-	101	114	112	109	-	-	-	-	108
<b>EXTREME</b>	Ag Reliant/LG	-	107	114	106	109	-	-	-	-	108
<b>SOMERSET</b>	NK Brand	2.5	110	109	102	107	-	-	-	-	108
SUMMERGOLD	Renk	-	-	-	-	-	113	102	108	-	108

**Table 1. Alfalfa variety yield as percentage of check varieties at Rosemount (Dakota County) (continued).**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.		Marketer	2003 Seeding, Harvest Years				2004 Seeding, Harvest Years			2005 Seeding, Harvest Year	All Site-Years Average	
			WSI	2006	2005	2004	3-Year Total	2006	2005	2-Year Total		2006
<i>Checks, Tons/Ac 15%mc Hay</i>			5.24	6.28	6.61	18.13	7.19	6.88	14.07	6.59	6.67	
<b>NOTICE II</b>	Channel		-	96	110	106	104	-	-	-	-	107
<b>54V46</b>	Pioneer		-	102	115	105	107	110	102	106	115	107
4A421	Mycogen		2.5	111	100	104	105	-	-	-	-	107
53Q30	Pioneer		-	-	-	-	-	-	-	-	111	106
<b>ABUNDANCE</b>	Ziller		3.5	105	99	104	102	108	100	104	-	106
<b>ENFORCER</b>	FFR Co-op		-	-	-	-	-	-	-	-	105	105
<b>LEGENDAIRY 5.0</b>	Croplan		3.0	-	-	-	-	103	97	101	-	105
<b>HYBRIFORCE-420/WET</b>	DairyLand		3.0	96	97	105	100	98	96	97	-	105
DKA42-15	DeKalb		2.5	-	-	-	-	107	102	105	-	105
<b>ALFASTAR II</b>	KayStar		-	103	111	107	107	-	-	-	-	105
JADE III	NC+		2.0	-	-	-	-	107	102	104	-	104
<b>54Q25</b>	Pioneer		-	99	106	96	100	110	99	105	-	104
VIKING 357	Allied/Albert Lea		-	-	-	-	-	105	91	98	101	104
5312	Check		-	102	100	104	102	106	102	104	103	104
8630	Mallard		-	-	-	-	-	-	-	-	103	103
MACON	Allied		-	-	-	-	-	105	101	103	-	103
<b>6400 HT</b>	Garst		2.5	95	103	96	98	107	101	104	105	103
<b>INTEGRITY</b>	PGI		-	-	-	-	-	-	-	-	109	103
<b>SURPASS</b>	Albert Lea		-	105	107	94	102	-	-	-	-	102
4R429	Mycogen		4.0	-	-	-	-	105	91	98	-	102
Wyo. BRR - Resistant	Public Exp.		-	-	-	-	-	101	107	104	-	101
<b>DAKOTA</b>	Great Plains		3.5	97	103	97	99	-	-	-	-	101
<b>6200 HT</b>	Garst		-	-	-	-	-	100	99	100	-	100
BARALFA 53HR	Barenbrug		-	98	103	97	100	-	-	-	-	100
4500	Legend		-	104	98	96	99	-	-	-	-	99
<b>54H91</b>	Pioneer		3.0	105	95	94	98	-	-	-	-	98
ONEIDA VR	Check		-	95	94	87	92	92	94	93	97	98
VERNAL	Check		2.0	104	105	109	106	101	104	103	100	98
DKA50-18	Dekalb		-	102	100	90	97	-	-	-	-	98
RUGGED	Target		2.0	87	106	99	98	-	-	-	-	97
SHAW	Albert Lea		-	-	-	-	-	97	98	97	-	97
AGATE	Public		-	90	97	99	96	-	-	-	-	95
BARALFA 42 IQ	Barenbrug		2.0	-	-	-	-	-	-	-	95	95
WRANGLER	Albert Lea		-	91	100	91	94	-	-	-	-	94
LSD 5%				25	14	9	12	10	7	7	9	

**Table 2. Alfalfa variety yield as percentage of check varieties at Potsdam (Olmsted County) and Lamberton (Redwood County).**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.		Marketer	WSI	Potsdam			Lamberton				All Site-Years Average	
				2004 Seeding Harvest Years			2003 Seeding Harvest Years			2005 Seeding Harvest Year		
			2006	2005	2-Year Total	2006	2005	2004	3-Year Total	2006		
<i>Checks, Tons/Ac 15%mc Hay</i>			8.95	8.04	16.99	6.69	6.17	7.06	19.91	8.35	6.67	
<b>WL 348 AP</b>	W-L		2.0	116	110	113	-	-	-	-	-	116
<b>LIGHTNING III</b>	Jung		2.5	119	108	114	-	-	-	-	-	112
<b>6415</b>	Garst		2.0	115	105	111	115	106	94	105	105	110
<b>6420</b>	Garst		-	112	108	110	113	111	108	111	105	110
<b>REBOUND 5.0</b>	Croplan		-	114	111	113	-	-	-	-	100	110
<b>GH 711</b>	Golden Harvest		2.0	-	-	-	111	109	101	107	-	110
4S419	Mycogen		-	-	-	-	-	-	-	-	102	109
<b>PHABULOUS II</b>	Trelay		-	113	108	111	-	-	-	-	-	108

**Table 2. Alfalfa variety yield as percentage of check varieties at Potsdam (Olmsted County) and Lamberton (Redwood County) (continued).**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.		Marketer	WSI	Potsdam			Lamberton				All Site-Years Average	
				2004 Seeding			2003 Seeding		2005 Seeding			2006
				2006	2005	2-Year Total	Harvest Years		Harvest Years			
<i>Checks, Tons/Ac 15%mc Hay</i>			<i>8.95</i>	<i>8.04</i>	<i>16.99</i>	<i>6.69</i>	<i>6.17</i>	<i>7.06</i>	<i>19.91</i>	<i>8.35</i>	<i>6.67</i>	
<b>GENOA</b>	NK Brand	2.0	115	108	111	-	-	-	-	103	108	
WL 357 HQ	W-L	2.0	-	-	-	-	-	-	-	97	108	
<b>EXTREME</b>	Ag Reliant/LG	-	115	110	112	-	-	-	-	-	108	
<b>54V46</b>	Pioneer	-	109	109	109	109	104	96	103	104	107	
53Q30	Pioneer	-	-	-	-	-	-	-	-	96	106	
<b>HYBRIFORCE-420/WET</b>	DairyLand	3.0	119	115	117	99	100	98	99	-	105	
FSG 400LH	Allied	-	105	105	105	-	-	-	-	-	105	
<b>ALFASTAR II</b>	KayStar	-	-	-	-	108	104	97	103	-	105	
<b>54Q25</b>	Pioneer	-	107	102	105	107	99	100	102	-	104	
<b>620</b>	Garst	2.5	-	-	-	104	100	105	103	-	104	
VIKING 357	Allied/Albert Lea	-	114	109	111	-	-	-	-	-	104	
5312	Check	-	107	106	106	102	107	101	103	103	104	
8630	Mallard	-	-	-	-	-	-	-	-	100	103	
<b>6400 HT</b>	Garst	2.5	108	105	107	-	-	-	-	95	103	
INTEGRITY	PGI	-	-	-	-	-	-	-	-	96	103	
<b>DAKOTA</b>	Great Plains	3.5	-	-	-	107	86	105	100	-	101	
<b>54H91</b>	Pioneer	3.0	-	-	-	94	91	98	95	-	98	
ONEIDA VR	Check	-	95	97	95	100	97	97	98	100	98	
VERNAL	Check	2.0	98	98	98	98	96	101	98	96	98	
<b>FEAST +EV</b>	Garst	2.0	-	-	-	93	91	97	94	-	96	
RADIANT	Ampac	-	-	-	-	90	73	96	87	-	86	
LSD 5%			11	10	10	10	13	12	8	7		

**Table 3. Alfalfa variety yield as percentage of check varieties at Stearns County and Otter Tail County.**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.		Marketer	WSI	Stearns County				Otter Tail County			All Site-Years Average
				2003 Seeding			2005 Seeding	2004 Seeding		2006	
				2006	2005	2004		Harvest Years			
<i>Checks, Tons/Ac 15%mc Hay</i>			<i>9.57</i>	<i>7.20</i>	<i>6.51</i>	<i>23.29</i>	<i>6.83</i>	<i>8.85</i>	<i>7.59</i>	<i>16.44</i>	<i>6.67</i>
<b>WL 348 AP</b>	W-L	2.0	116	120	120	119	-	-	-	-	116
<b>GOLDLEAF</b>	Al. Lea/Gold Co.	3.0	112	115	118	115	-	-	-	-	114
LABRADOR	Dahlco	-	-	-	-	-	114	-	-	-	114
<b>DKA33-16</b>	Dekalb	-	123	114	123	120	109	-	-	-	114
<b>POWER 4.2</b>	Power	-	113	111	118	114	-	-	-	-	112
<b>LIGHTNING III</b>	Jung	2.5	-	-	-	-	-	112	107	110	112
<b>6415</b>	Garst	2.0	120	118	122	120	113	119	108	114	110
<b>6420</b>	Garst	-	112	111	117	113	111	-	-	-	110
VALUE PLUS I	Brown Seed	3.0	107	111	114	110	-	-	-	-	110
<b>PHIRST</b>	Bio Plant	-	114	111	116	114	-	-	-	-	110
<b>REBOUND 5.0</b>	Croplan	-	-	-	-	-	-	119	111	115	110
<b>GH 711</b>	Golden Harvest	2.0	109	112	112	111	-	-	-	-	110
BOBWHITE	NC+	-	-	-	-	-	-	113	104	109	109
4S419	Mycogen	-	-	-	-	-	112	-	-	-	109
<b>PHABULOUS II</b>	Trelay	-	116	113	124	117	-	-	-	-	108
<b>GENOA</b>	NK Brand	2.0	-	-	-	-	112	-	-	-	108
WL 357 HQ	W-L	2.0	-	-	-	-	108	-	-	-	108
<b>IGNITE</b>	Jung	-	116	112	115	114	-	-	-	-	108
FSG 351	Allied	-	-	-	-	-	-	106	108	107	108
<b>EXTREME</b>	Ag Reliant/LG	-	109	117	115	113	-	110	110	110	108

**Table 3. Alfalfa variety yield as percentage of check varieties at Stearns County and Otter Tail County (continued).**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.		Marketer	WSI	Stearns County				Otter Tail County			All Site-Years Average
				2003 Seeding		2005 Seeding		2004 Seeding		2-Year Total	
				Harvest Years				Harvest Year	Harvest Years		
				2006	2005	2004	3-Year Total	2006	2006	2005	
<i>Checks, Tons/Ac 15%mc Hay</i>			9.57	7.20	6.51	23.29	6.83	8.85	7.59	16.44	6.67
<b>SOMERSET</b>	NK Brand	2.5	117	110	117	115	108	-	-	-	108
<b>NOTICE II</b>	Channel	-	111	106	116	111	-	-	-	-	107
FSG 408DP	Allied	-	-	-	-	-	-	106	108	107	107
<b>54V46</b>	Pioneer	-	112	112	124	115	114	109	102	106	107
53Q30	Pioneer	-	-	-	-	-	107	-	-	-	106
WL 319 HQ	W-L	1.5	-	-	-	-	-	110	102	106	106
<b>ABUNDANCE</b>	Ziller	3.5	112	111	107	110	-	-	-	-	106
<b>HYBRIFORCE-420/WET</b>	DairyLand	3.0	112	114	111	113	-	105	102	104	105
<b>54Q25</b>	Pioneer	-	110	109	110	110	-	105	106	106	104
<b>620</b>	Garst	2.5	104	107	113	107	-	-	-	-	104
<b>A 30-06</b>	PGI	2.0	105	106	110	107	-	94	101	97	104
5312	Check	-	103	105	106	104	106	104	104	104	104
8630	Mallard	-	-	-	-	-	108	-	-	-	103
<b>6400 HT</b>	Garst	2.5	102	105	112	106	103	106	107	106	103
<b>LEGENDAIRY 5.0</b>	Croplan	3.0	-	-	-	-	109	111	96	104	103
4R429	Mycogen	4.0	-	-	-	-	109	-	-	-	102
Wyo. BRR - Resistant	Public Exp.	-	-	-	-	-	-	99	99	99	101
<b>DAKOTA</b>	Great Plains	3.5	109	99	107	105	-	-	-	-	101
<b>6200 HT</b>	Garst	-	-	-	-	-	103	94	101	98	100
<b>54H91</b>	Pioneer	3.0	97	104	112	103	-	-	-	-	98
ONEIDA VR	Check	-	105	97	103	102	97	100	97	99	98
VERNAL	Check	2.0	92	98	91	93	97	97	98	98	98
<b>FEAST +EV</b>	Garst	2.0	102	101	107	103	-	-	-	-	96
LSD 5%			7	9	8	6	8	13	11	11	

**Table 4. Alfalfa variety yield as percentage of check varieties at Grand Rapids (Itasca County).**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.		Marketer	WSI	2003 Seeding, Harvest Years				2005 Seeding, Harvest Year	All Site-Years Average				
				2006	2005	2004	3-Year Total	2006					
				<i>Checks, Tons/Ac 15%mc Hay</i>			2.95	4.33		5.54	12.82	3.35	6.67
				SETTER	Dahlco	-	114	104		108	108	-	109
<b>EXTREME</b>	Ag Reliant/LG	-	105	95	95	97	-	108					
<b>SOMERSET</b>	NK Brand	2.5	110	95	105	103	-	108					
<b>54V46</b>	Pioneer	-	106	101	109	106	97	107					
4A421	Mycogen	2.5	-	-	-	-	112	107					
53Q30	Pioneer	-	-	-	-	-	111	106					
LEGENDAIRY YPQ	Croplan	-	111	101	104	105	-	105					
<b>HYBRIFORCE-420/WET</b>	DairyLand	3.0	114	103	104	106	-	105					
<b>54Q25</b>	Pioneer	-	107	106	100	104	-	104					
<b>A 30-06</b>	PGI	2.0	115	108	94	104	-	104					
<b>620</b>	Garst	2.5	102	102	99	101	-	104					
5312	Check	-	101	98	98	99	110	104					
<b>6400 HT</b>	Garst	2.5	-	-	-	-	101	103					
<b>LEGENDAIRY 5.0</b>	Croplan	3.0	-	-	-	-	101	103					
AMERISTAND 403T	America's Alfalfa	2.0	108	97	99	100	-	101					
<b>6200 HT</b>	Garst	-	-	-	-	-	103	100					
ONEIDA VR	Check	-	108	106	109	108	95	98					
<b>54H91</b>	Pioneer	3.0	94	99	96	97	-	98					
VERNAL	Check	2.0	91	96	93	93	95	98					
<b>FEAST +EV</b>	Garst	2.0	95	96	83	90	-	96					
LSD 5%			16	7	15	8	12						

**Table 5. Seeding year alfalfa variety yields as a percentage of check varieties at Rosemount and Otter Tail County**

Variety, in descending order of average performance over all current Minn. trials. <b>Bold</b> varieties have been in Minn. trials for more than 5 site-years.	Marketer	WSI	Rosemount	Otter Tail	All Site-Years Average
			2006 Seeding, Harvest Year	2006 Seeding, Harvest Year	
			2006	2006	
<i>Checks, Tons/Ac 15%mc Hay</i>			3.89	3.09	3.49
MARINER III	Allied	-	107	-	107
<b>6400 HT</b>	Garst	2.5	-	103	103
5312	Check	-	104	102	103
<b>GENOA</b>	NK Brand	2.0	108	98	103
<b>6200 HT</b>	Garst	-	-	102	102
<b>54V46</b>	Pioneer	-	106	98	102
<b>6415</b>	Garst	2.0	105	95	100
53Q30	Pioneer	-	107	94	100
ONEIDA VR	Check	-	101	100	100
DKA34-17RR	DeKalb	-	98	-	98
VERNAL	Check	2.0	95	98	97
DKA41-18RR	Dekalb	-	96	-	96
AMERISTAND 407TQ	America's Alfalfa	-	-	96	96
6443 RR	Garst	-	99	90	94
WL 343 HQ	W-L	2.0	99	87	93
LSD 5%			11	11	

**Table 6a. 2006 Alfalfa variety forage quality and yield for a 2005 seeding at Rosemount, Minn.**

Variety or experimental germplasm	Year's Total DM Yield Ton/Acre	Milk, (%) <sup>2</sup>		RFQ <sup>3</sup> Index	CP <sup>3</sup> , % DM	NDF <sup>3</sup> , % DM	NDFD <sup>4</sup> , % NDF
		Total Lb/Acre	Average Lb/Ton				
6415	6.4	113	101	201	21.0	34.0	50.8
53Q30	6.2	110	103	210	21.6	33.2	52.2
Experimental 1 <sup>5</sup>	6.1	105	100	200	22.0	33.4	49.7
Experimental 2 <sup>5</sup>	6.0	105	101	206	22.0	33.0	50.4
WL 322 HQ	5.8	103	102	209	22.1	33.1	51.5
CIMARRON	6.0	102	98	185	21.0	35.7	49.1
VERNAL	5.8	100	100	192	20.7	35.5	51.3
Vernal, actual values	5.8	18,600	3,200	192	20.7	35.5	51.3
Mean	6.0	105	101	200	21.5	34.0	50.7
LSD (0.05)	ns	7	3	14	0.9	1.8	1.7
CV (%)	5	5	2	5	3	4	2

<sup>1</sup> Three-harvest total taken on 25 May, 6 July and 7 August in 2006.

<sup>2</sup> Milk production potential (pounds milk per acre and ton) are predicted using spreadsheet MILK2000 ver.7.54, University of Wisconsin.

<sup>3</sup> RFQ=relative forage quality; CP=crude protein; and NDF=neutral detergent fiber concentration average for the season.

<sup>4</sup> NDFD=neutral detergent fiber digestibility average for the season.

<sup>5</sup> Entered as experimental germplasm by alfalfa breeder.

**Table 6b. 2006 Alfalfa variety forage quality and yield for a 2006 seeding at Rosemount, Minn.**

Variety or experimental germplasm	DM yield Ton/Acre	Milk, (%) <sup>2</sup>		RFQ <sup>3</sup> Index	CP <sup>3</sup> , % DM	NDF <sup>3</sup> , % DM	NDFD <sup>4</sup> , % NDF
		Total Lb/Acre	Average Lb/Ton				
Experimental 3 <sup>5</sup>	3.3	113	104	225	19.7	33.4	58.9
53Q30	3.3	112	104	222	19.5	33.8	58.7
6415	3.1	107	103	226	19.1	33.6	59.3
WL 322 HQ	3.2	105	100	212	19.7	34.3	56.3
CIMARRON	3.2	103	98	193	18.4	37.1	55.5
VERNAL	3.0	100	100	202	18.2	36.7	57.7
Vernal, actual values	3.0	10,200	3,400	202	18.2	36.7	57.7
Mean	3.2	107	101	213	19.1	34.8	57.7
LSD (0.05)	ns	10	4	16	0.9	1.8	2.1
CV (%)	5	6	3	5	3	4	2

<sup>1</sup> Two-harvest total taken on 25 July and 30 August in 2006.

<sup>2</sup> Milk production potential (pounds milk per acre and ton) are predicted using spreadsheet MILK2000 ver.7.54, University of Wisconsin.

<sup>3</sup> RFQ=relative forage quality; CP=crude protein; and NDF=neutral detergent fiber concentration average for the season.

<sup>4</sup> NDFD=neutral detergent fiber digestibility average for the season.

<sup>5</sup> Entered as experimental germplasm by alfalfa breeder.

**Table 7a. Regional evaluation of potato-leafhopper-resistant alfalfa varieties for the seeding year and year after seeding at S. Charleston, Ohio, and Ames, Iowa, seeded spring 2005.**

Variety	Marketer	Yield <sup>1</sup>	PLH Yield Index <sup>2</sup>	WSI	Yield Tested in Minn.
54H91	Pioneer	1.08*	36	3.0	Yes
WL347LH	WL Research	1.07*	35	-	No
FSG400LH	Allied Seed	1.05*	32	-	Yes
ENFORCER	Allied Seed	1.01*	27	-	Yes
WL345LH	WL Research	0.95	19	-	No
BLUEBIRD HR	Blue River Hybrids	0.91	15	-	No
Susceptible Checks <sup>3</sup>		0.80			
LSD (0.05)		0.22			

\* Yield significantly greater than yield of susceptible checks.

<sup>1</sup> Average yield for harvests in seeding year and year after seeding when potato leafhoppers caused injury to alfalfa.

<sup>2</sup> The % yield improvement over the yield of susceptible check varieties.

<sup>3</sup> Average of three susceptible varieties (5454, DK140, Vernal).

**Table 7b. Regional evaluation of potato-leafhopper-resistant alfalfa varieties for the seeding year at S. Charleston, Ohio, and Ames, Iowa, seeded spring 2006.**

Variety	Marketer	Yield <sup>1</sup> Tons/Acre	PLH Yield Index <sup>2</sup> %	WSI	Yield Tested in Minn.
53H92	Pioneer	1.19*	50	-	No
6426PLH	Garst	1.10*	39	-	No
4P424	Mycogen Seeds	1.09*	38	-	No
EVERGREEN <sup>3</sup>	NK Brand Seed	1.02*	29	-	No
54H91	Pioneer	1.01*	28	3.0	Yes
GH773LH	Goldern Harvest Seeds	0.93	17	-	No
Susceptible Checks <sup>3</sup>		0.79			
LSD (0.05)		0.17			

\* Yield is significantly greater than yield of the susceptible check varieties..

<sup>1</sup> Average yield for harvests in seeding year when potato leafhoppers caused injury to alfalfa.

<sup>2</sup> The percentage yield improvement over the yield of susceptible check varieties.

<sup>3</sup> Average yield of three susceptible varieties (5454, DK140, Vernal).

**Table 8. 2006 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 Sup.	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/Gldn Harvest	Sherburne	MN	56171	507-764-3640	402-289-0245 612-565-2945	www.goldenharvestseeds.com
Johnson	Johnson Seeds	Dassel	MN	55325	320-275-2430		www.seed.ab.ca/grower/Johnson
Jung	Jung Seed Genetics	Eyota	MN	55934	507-545-0151	800-242-1855	www.jungseedgenetics.com
Kaltenberg	Kaltenberg Seed Farms	Waunakee	WI	53597	800-383-3276		www.kaltenburgseeds.com
KayStar	KayStar Seeds	Huron	SD	57350	605-352-8791		www.kaystarseed.com
La Crosse	La Crosse Forage & Turf Seed Co.	LaCrosse	WI	54603	608-783-9560		
Legacy	Legacy Seeds, Inc.	Waupaca	WI	54981	866-791-6390		www.legacyseeds.com
Legend	Legend Seeds	DeSmet	SD	57231	605-854-3346		www.legendseeds.com
LG Seeds	LG Seeds	Sauk Rapids	MN	56379	320-248-0042	715-426-7577	www.lgseeds.com
Mallard	Mallard Seed	Plainview	MN	55964	507-534-2300		
Monsanto	Monsanto Global Seed Group	St Louis	MO	63167	314-694-5701		www.monsanto.com
Mycogen	Mycogen Seeds	Holmen	WI	54636	608-526-2627	317-337-4007	www.mycogen.com
NC+	NC+ Hybrids	Spencer	IA	51301	712-262-9216	402-467-2517	www.nc-plus.com
North-Gro	North-Gro Seeds	Cuba City	WI	53807	608-744-7333		www.northgro.com
Olds Seed	Olds Seed Solutions	Madison	WI	53707	800-356-7333	608-249-9291	seedsolutions.com
PGI Alfalfa	PGI Alfalfa Inc.	Story City	IA	50248	800-247-3967	515-733-5274	
Pioneer	Pioneer Hi-Bred International	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	wensman@wensmanseed.com
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 Minn.	University of Minnesota Forages	Saint Paul	MN	55108	612-625-8789		http://forages.cfans.umn.edu