

2015 Alfalfa Field Crop Trials Results



Minnesota Agricultural Experiment Station and the College of Food, Agricultural and Natural Resource Sciences

Forage yield and forage quality are important factors in determining economic return per acre for alfalfa production. Selecting alfalfa varieties with high yield potential and persistence is fundamental to obtaining and maintaining high yields.

Yield potential of alfalfa varieties are continually evaluated in research trials at University of Minnesota Research and Outreach Centers and on cooperating farmers' fields. The trials are conducted using recommended fertility and pest control practices to optimize alfalfa yield and persistence.

Test locations are in alfalfa production regions with different winter injury risk. Test locations include Rosemount (Dakota Co.), Zumbro Falls (Wabasha Co.), Lamberton (Redwood Co.), Richmond (Stearns Co.), and Underwood (Otter Tail Co.). Yield performance of conventional (non-Roundup Ready) varieties is presented as a percentage of check variety yields (avg.



for Vernal, Oneida VR, and 5312).

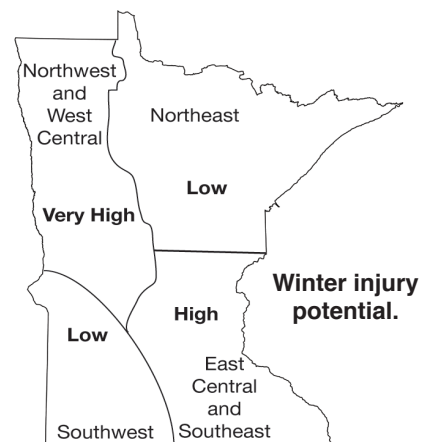
Yield results for alfalfa varieties currently tested Minnesota yield trials (2012 to 2015 seeding years) are listed in Tables 1 through 4; alfalfa variety, seed marketers, and matching web sites are provided in Table 5. Disease resistance information for alfalfa varieties is available on the web at www.alfalfa.org.

Winterhardiness and Winter Survival Index (WSI)

The potential of severe winters make winterhardiness a primary consideration in variety selection for most areas of Minnesota. Winter hardiness of varieties is difficult to determine because winter injury can occur as a result of weather events that cause varied responses in alfalfa plants of differing ages.

The best indicator of winter survival potential is the yield performance in the third production year after seeding. Fall dormancy rating is sometimes an indicator of wintersurvival potential and is available at www.alfalfa.org.

Our long-term results show that when selecting alfalfa varieties, greatest winterhardiness is needed in west central and northwestern Minnesota (see winter injury potential map). 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 Min-



nesota 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 (2012 to 2015 seedings). Individual tables correspond to test results from different regions of Minnesota. LSD numbers beneath yield columns indicate whether the difference between yields is due to genetics or to other factors, such as variations in the environment. If the yield difference between two entries equals or exceeds the LSD value, the higher-yielding entry probably

was superior in yield. A difference less than the LSD value is probably due to environmental factors.

Varietal yield difference tends to increase with stand age. Thus, to choose a variety for short-term stands, consider yield performance the first and second years after seeding (e.g., yield performance in 2014 and 2015 for a 2013 seeding). For long-term stands, choose varieties based on their performance through the third year after seeding (e.g. 2015 yield for 2012 seeding).

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. Variety resistance to potato leaf hopper is available at www.alfalfa.org.

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.

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). Variety resistance ratings for each disease are available on the web at www.alfalfa.org. 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 (2.0) WSI have at least (R) levels of disease resistance to produce more than two years after the seeding year under intensive management (4 cuts/season) in the east central and southeastern areas of Minnesota.

Roundup Ready

Roundup Ready alfalfa varieties are tested in trials in Dakota and Stearns County for comparing their yields and are presented in Table 4. Roundup was used at the recommended rate for weed control. Otherwise alfalfa was managed using protocols employed in the conventional variety trials.

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

Variety ¹	Marketer	Rosemount							
		2012 Seeding				2013 Seeding			2014 Seeding
		2013	2014	2015	3-Year Total	2014	2015	2-Year Total	2015
MARINER IV	La Crosse	124	120	127	123	—	—	—	—
MAGNITUDE	La Crosse	110	116	131	118	—	—	—	—
SOLARGOLD	Renk	113	116	122	116	—	—	—	—
HYBRIFORCE-3400	Dairyland	122	117	108	117	—	—	—	—
55Q27	PIONEER	120	124	127	124	94	110	102	112
HYBRIFORCE-2400	Dairyland	—	—	—	—	100	113	106	—
LS 804	Legacy	—	—	—	—	—	—	—	110
55V50	PIONEER	118	119	122	119	107	116	111	114
DG 4210	Crop Prod.	—	—	—	—	90	115	102	—
FORAGEGOLD	Renk	119	120	121	120	95	113	104	—
FSG 403LR	La Crosse	—	—	—	—	107	110	108	—
L 455HD	Legacy	—	—	—	—	97	111	104	—
55H94	PIONEER	107	109	110	109	—	—	—	—
54QR04	Pioneer	—	—	—	—	94	113	103	—
GA-409	Prof. Alf.	—	—	—	—	—	—	—	104
54R02	PIONEER	—	—	—	—	98	108	103	—
FSG 424	LaCrosse	—	—	—	—	91	110	100	—
9558 SBR	Cornell	—	—	—	—	99	102	101	—
PGI 529	Producer	—	—	—	—	88	108	98	—
MATRIX	ALBERT LEA	—	—	—	—	88	90	89	—
5312	Check	104	104	107	105	101	101	101	102
ONEIDA VR	Check	104	102	99	102	97	103	100	101
VERNAL	Check	92	94	94	93	101	96	99	97
Checks, tons/acre as hay		6.3	6.1	4.5	16.9	5.7	5.1	10.8	7.2
LSD 5%		11	8	16	8	8	7	6	8

¹Varieties are ranked according to their performance across all current trials.

Blends

Some 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. 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. Therefore, using certified seed of adapted, high-yielding varieties best assures trueness to name.

For the web version of this report, go to the Minnesota Agricultural

Experiment Station (MAES) website: www.maes.umn.edu/pubs.html.

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

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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 2. Alfalfa variety yield as percentage of check varieties at Zumbro Falls (Wabasha County), Lamberton (Redwood County), Richmond (Stearns County) and Underwood (Otter Tail County).

Variety ¹	Marketer	Zumbro Falls		Lamberton		Underwood		Richmond	
		2014 Seeding	2015	2013 Seeding	2-Year Total	2014 Seeding	2015	2013 Seeding	2-Year Total
LEGENDAIRY XHD	CROPLAN	—	114	111	112	—	116	121	119
Magnum 7	Dairyland	—	—	—	—	—	117	114	116
55Q27	PIONEER	107	108	116	113	122	116	128	122
HYBRIFORCE-2400	Dairyland	—	123	116	119	—	120	121	120
620	Mustang	—	119	110	114	—	—	—	—
LS 804	Legacy	—	—	—	—	118	—	—	—
55V50	PIONEER	106	109	102	105	121	119	116	117
DG 4210	Crop Prod.	—	111	116	114	—	124	124	124
FORAGEGOLD	Renk	—	102	103	103	—	114	119	117
FSG 403LR	La Crosse	—	115	113	114	—	—	—	—
YIELDMAX	Legend Seeds	—	—	—	—	—	111	111	111
L 455HD	Legacy	101	110	113	112	123	112	122	117
55VR06	Pioneer	102	—	—	—	118	—	—	—
TOUGHMAX	Legend	99	—	—	—	114	—	—	—
54QR04	Pioneer	—	113	112	112	—	—	—	—
LH9700	Latham	105	—	—	—	—	—	—	—
520BR	Mustang	—	109	98	103	—	—	—	—
GENUITY POWERHOUSE RR	Legend	98	—	—	—	107	—	—	—
9558 SBR	Cornell	—	88	97	93	—	105	109	107
5312	Check	104	99	103	101	105	103	105	104
ONEIDA VR	Check	97	102	101	102	99	102	96	99
VERNAL	Check	99	99	96	97	96	95	99	97
Checks, tons/acre as hay		6.3	3.8	4.8	8.6	6.2	5.3	5.5	10.8
LSD 5%		7	20	15	24	10	9	9	0.67

¹Varieties are ranked according to their performance across all current trials.

Table 3. Alfalfa Roundup Ready variety yield as percentage of all varieties at Rosemount (Dakota County) and Richmond (Stearns County).

Variety ¹	Marketer	Rosemount				Richmond			
		2012 Seeding			3-Year Total	2014 Seeding		2013 Seeding	
		2013	2014	2015		2015	2014	2015	2-Year Total
55VR06	Pioneer	—	—	—	—	103	—	—	—
54QR04	Pioneer	—	—	—	—	—	99	107	103
POWERHOUSE RR	Legend Seed	—	—	—	—	—	102	106	104
DKA41-18RR	DeKalb	—	—	—	—	—	104	103	104
GENUITY POWERHOUSE RR	Legend	—	—	—	—	101	—	—	—
AMERISTAND 455TQ RR	Am. Alf.	—	—	—	—	—	97	106	102
428RR	LaCrosse Forage	—	—	—	—	—	101	102	102
54R02	PIONEER	103	100	98	100	—	101	99	100
YIELDMASTER RR	Jung	—	—	—	—	—	100	99	100
WL 372HQ.RR	WL	—	—	—	—	-	97	102	99
DKA44-16RR	DeKalb	—	—	—	—	97	100	100	100
DKA40-51RR	DeKalb	—	—	—	—	99	—	—	—
WL 356HQ.RR	WL	—	—	—	—	—	103	94	99
CONSISTENCY 4.10RR	PAKR	—	—	—	—	—	100	97	99
6497R	NEXGROW	—	—	—	—	—	97	100	99
RR501	Monsanto	—	—	—	—	97	—	—	—
MEGAMAXRR	Legend Seeds	—	—	—	—	—	97	94	96
RR STRATICA	CROPLAN	—	—	—	—	—	99	90	95
Ave, tons/acre as hay		6.76	6.56	5.69	19.01	8.1	6.3	6.4	12.6
LSD 5%		6	8	ns	ns	ns	ns	10.97	9

¹The RR trial the average is over all of the varieties in the trial.

Table 4. Seeding year alfalfa variety yields as a percentage of check varieties at Rosemount (Dakota County) and Richmond (Stearns County) and seeding year Roundup Ready variety yield as percentage of all varieties at Rosemount (Dakota County).

Variety	Marketer	Rosemount ¹		Richmond ¹		Rosemount RR ²	
		2015 Seeding		2015 Seeding		2015 Seeding	
		2015	2015	2015	2015	2015	2015
55Q27	PIONEER	86	—	107	—	—	—
55V50	PIONEER	91	—	125	—	—	—
DKA44-16RR	DeKalb	—	—	—	—	—	103
DKA40-51RR	DeKalb	—	—	—	—	—	96
FSG 426	La Crosse	—	—	109	—	—	—
55VR08	Du Pont	—	—	—	—	—	106
55Q14	Du Pont	91	—	114	—	—	—
430 RRLH	LaCrosse	—	—	—	—	—	94
FSG 426	La Crosse	86	—	—	—	—	—
FF42.A2	La Crosse	86	—	—	—	—	—
5312	Check	103	—	105	—	—	—
ONEIDA VR	Check	98	—	97	—	—	—
VERNAL	Check	98	—	98	—	—	—
Checks, tons/acre as hay		3.9	2.8	2.8	Ave, tons/acre as hay	2.5	
LSD 5%		13	13	13	LSD 5%	ns	

¹Varieties are ranked according to their performance across all current trials.

²The RR trial the average is over all of the varieties in the trial.

Table 5. Sources of forage seed for 2015 trials.

Marketer	Company	Web URL
Albert Lea	Albert Lea Seed House	www.alseed.com
America's Alfalfa	America's Alfalfa	www.americasalfalfa.com
Beck's	Beck's Hybrids	www.beckshybrids.com
Blue River	Blue River Hybrids	www.blueriverorgseed.com
BrettYoung	BrettYoung	www.brettyoung.ca/USA
Channel	Channel Seed	www.channel.com
Crop Prod.	Crop Production Services	www.cpsagu.com
CROPLAN	CROPLAN Genetics	www.croplangenetics.com
DairyLand	DairyLand Seed	www.dairylandseed.com
Dekalb	AsgrowDekalb	www.asgrowanddekalb.com
Jung	Jung Seed Genetics	www.jungseedgenetics.com
La Crosse	La Crosse Forage and Turf	www.lftseed.com
Legacy	Legacy Seeds	www.legacyseeds.com
Legend	Legend Seeds	www.legendseeds.com
Mustang	Mustang Seeds	www.mustangseeds.com
Nexgrow	Nexgrow	www.plantnexusgrow.com
NuTech	NuTech Seed	www.nutechseed.com
Pioneer	Pioneer Hi-Bred International	www.pioneer.com
Producer	Producer's Choice	www.producerschoiceseed.com
Renk	Renk Seed	www.renkseed.com
W-L	W-L Research	www.wlresearch.com
U of MN	University of Minnesota Forages	www.extension.umn.edu/forages