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Northern Idaho Alfalfa Variety Testing Report

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Cover: Alfalfa near Nezperce, ID. Photo by Doug Finkelnburg, University of Idaho Area Extension Educator.

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Alforex Seeds

Big Sky Wholesale Seeds

Croplan

Dairyland Seeds

DeKalb

Eureka

Nexgrow Alfalfa

W-L Research

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Introduction

This report summarizes the performance of alfalfa varieties tested in extension variety trials conducted in northern Idaho during 2013–2016 crop seasons. The variety trials were located in cooperators' fields at two sites, one each in Lewis and Idaho counties.

Increased field crop yield is the result of a combination of improved agronomic practices and advances in variety development. Trials reported in this publication help producers compare new varieties with widely grown varieties, using field production practices common for their area. The provided information represents crop performance results from specific locations, production practices, and environmental conditions. Relative performance of varieties can change when tested under other environments and production practices. Evaluation of any variety included in these trials should not be construed as recommending any variety over varieties not included in the trials.

Alfalfa Test Procedures

Two alfalfa variety trials were planted in northern Idaho in the spring of 2013. Seeding rates for all entries was a uniform number of seeds planted per square foot (spsf). These rates were determined by weighing 300 seeds of each alfalfa variety. Alfalfa was planted at 15 spsf. All plots were seeded 20 feet long on 5-foot centers using a double-disc opener with 7 rows, 7 inches apart. Seed was planted $\frac{1}{2}$ – $\frac{3}{4}$ inches deep. At each location, each variety was replicated four times in a randomized complete block design. After plants were well established, the beds were cut back to a plot size length of 15 feet with an application of glyphosate using a tractor-mounted, shielded sprayer between plots. Pesticides were applied by the cooperator while treating the remainder of the field surrounding the trial. Fertilizers and pesticides used in the trials are listed in Table 1 for the sites where the information was provided. Planting and swathing operations by University of Idaho personnel were timed to approximately coincide with the cooperator's operations.

Prior to cutting, plot lengths were measured to more accurately determine the harvestable area for each plot. Plots were swathed with a plot-swather using a 5-foot cycle-type cutting bar. Plots were cut at approximately 4-inches of height. Alfalfa from each plot was weighed on site directly after cutting. Subsamples were taken from each plot and dried to determine water-weight in each plot. Plot yields were adjusted to reflect dry weights. In 2013 and 2014, sub-samples were analyzed for forage quality by Northwest Labs, LLC.

Statistical Interpretation

Data in the tables are sorted by yield, with the highest yielding entries listed first. The overall trial average is shown at the bottom of each table. The least significant difference (LSD) and the coefficient of variation (CV) are listed. The LSD is given at the 5 percent error level and aids in comparing varieties. If the measured values of any two varieties within a column differ by the LSD value or greater, they can be considered different with a confidence level of 95%. If the measured values are less than the LSD value, the differences may be due to random error rather than actual varietal differences. If no

significant statistical differences were found among varieties, “ns” (not significant) is shown for the LSD. The CV listed in the tables is given as a general measurement of the precision of each experiment. Lower CV percentage values indicate lower experimental variation and greater precision. A higher CV value indicates abnormal variation within the trial that could be due to external factors such as animal grazing, hail damage, or other variable stress on the plants. CV values were not averaged across trials or years.

Variety choice should take into consideration as much performance data as possible with comparisons across years and locations. In addition to yield, other factors such as protein content, disease resistances, winter hardiness, and any observations from grower experience can be used in deciding on which variety to plant. Due to seasonal variation, caution should be taken when looking at the results from a single growing season.

Growing Conditions and Factors Affecting Trial Results

Both trials were located in silt loam soils at elevations of approximately 3200 ft. On average, the Idaho County trial received less precipitation between October 1 and the date of first cutting (11 inches) when compared with the Lewis County site (16 inches). More favorable precipitation at Lewis County trial is reflected in better yields and higher protein content, on average. 2015 was warmer and drier than average in both locations, but Idaho County suffered more extreme drought conditions which is reflected in starkly lower yields at that location in that year. No significant insect or disease issues were observed at either location.

Trial Locations, Management and Varieties Tested

Table 1. Trial location and management information for Idaho County, ID.

Idaho County Trial						
Year	Rainfall Oct 1: 1st Cutting* (inches)	Date of 1st Cutting	Fertilizer (N-P-K-S fall applied) lbs/ac	Micronutrients lbs/ac	Chemical Name Rate	
2013	11	28-Jun	24-30-0-0	-	Gramoxone Inteon	2-3 Pints/ac
2014	11	19-Jun	24-30-0-0	-	Gramoxone Inteon	2-3 Pints/ac
2015	8	17-Jun	24-30-0-0	-	Gramoxone Inteon	2-3 Pints/ac
2016	13	12-Jun	24-30-0-0	-	Gramoxone Inteon	2-3 Pints/ac

* Precipitation data is collected from the Grangeville, Idaho, airport weather station.

Notes: lat 46.140202°, long -116.246855°; elevation 2505 ft. Seeded May 29, 2012, following oats in conventionally tilled system.

Table 2. Trial location and management information for Lewis County, ID.

Lewis County Trial							
Year	Rainfall Oct 1: 1st Cutting* (inches)	Date of 1st Cutting	Soil Amendments	Fertilizer (N-P-K-S fall applied) lbs/ac	Micronutrients lbs/ac	Chemical Name Rate	
2011			100 lbs/ac Gypsum				
2012				4-20-0--20	1.5 Boron	--	--
2013	17	28-Jun	100 lbs/ac Gypsum	0-0-0-18	1.0 Boron	--	--
2014	16	20-Jun	100 lbs/ac Gypsum	4 -20-20-18	15 Chloride	--	--
2015	16	18-Jun	100 lbs/ac Gypsum	8-40-0-0		--	--
2016	16	13-Jun	100 lbs/ac Gypsum			--	--

* Precipitation data is from the Nezperce, Idaho, airport weather station.

Notes: lat 46.342457°, long -116.263771°. Direct seeded May 30, 2012.

Table 3. University of Idaho Extension Variety Entry List, 2013–2016.

Variety	Developer of Variety
AgRMS-101	AgResearch USA
AgRMS-102	AgResearch USA
AgRMS-103	AgResearch USA
PGI 215	Alforex Seeds
PGI 424	Alforex Seeds
Rugged	Alforex Seeds
TS 4010	Alforex Seeds
TS 4013 (Venus 4 PLUS T)	Alforex Seeds
Big Sky Ladak	Big Sky Wholesale Seeds
Graze N Hay 3.10RR	Croplan
Maxi-Graze	Croplan
Magnum - 7	Dairyland
Dryland	Dairyland Seeds
HybriForce - 2400	Dairyland Seeds
MsSunstra - 803	Dairyland Seeds
DKA34-17RR	DeKalb
DKA43-22RR	DeKalb
4R200	Eureka
Whitney	Eureka
FG 27C102	Forage Genetics
FG 310M150*	Forage Genetics
FG 46M126 (LegenDairy XHD)	Forage Genetics
FGR47M312	Forage Genetics
FGR48M137 (RR Presteez)	Forage Genetics
WL 355RR	La Crosse Seed
Cooper	Montana State University
Shaw	Montana State University
Melton	Montana State University
Spredor 5	Nexgrow Alfalfa
Vernal	Public
BB-10-11	USDA/ARS
WL 319HQ	W-L Research
WL 354HQ	W-L Research

Table 4. Alfalfa variety performance results at Idaho County, 2013–2016.

Variety	2013	2014	2015	2016	4-Year Average		Crude Protein [#]
					-----lbs/acre-----		%
					tons/acre		
Melton	3611	3743	3686	5292	4003	2	11
AgRMS-102	3679	3191	3558	5707	3939	1.97	10.9
Magnum - 7	4008	3554	3555	4872	3909	1.95	13.6
Big Sky Ladak	2951	3845	3177	4975	3625	1.81	14.7
AgRMS-103	3659	3561	2990	4683	3577	1.79	11.8
Shaw	3877	3373	2851	4404	3471	1.74	14.7
Cooper	4175	2902	2766	4410	3404	1.7	14.1
Whitney	3326	2989	2971	4559	3363	1.68	17.7
Rugged	3483	3173	2735	4624	3350	1.67	14.2
AgRMS-101	3166	2875	2966	4684	3332	1.67	8.4
WL 319HQ	3321	2996	2737	4702	3299	1.65	13.5
BB-10-11	3083	3061	2892	4439	3273	1.64	15.1
MsSunstra - 803	3189	2822	2521	5162	3243	1.62	16.1
Venus 4 PLUS T***	3427	2982	2773	4204	3232	1.62	13.6
WL 355RR	2794	3672	2726	4117	3207	1.6	13.3
Maxi-Graze	3251	2867	2587	4408	3140	1.57	12.6
Dryland	3377	2920	2502	4331	3126	1.56	12.4
Hybri Force - 2400	3426	2756	2430	4491	3106	1.55	13
FGR47M312	2607	3066	2634	3989	2986	1.49	11.6
WL 354HQ	3323	2877	2508	3651	2973	1.49	15.3
PGI 424	3408	2735	2278	3953	2930	1.47	14.5
Legendary XHD**	2800	3312	2330	3874	2929	1.46	15.6
Vernal	3230	2649	2431	3900	2928	1.46	13
PGI 215	2958	3189	2576	4109	2923	1.46	14.2
Graze N Hay 3.10RR	2729	2517	2436	4493	2922	1.46	12.7
FG 310M150	2537	2766	2576	4151	2921	1.46	13.9
Spredor 5	3179	2777	2268	4014	2901	1.45	12.3
FG 27C102	2704	3090	2472	3590	2866	1.43	13.7
4R200	2961	2772	2251	3817	2810	1.41	10.2
FGR48M137	3049	2746	2356	3521	2805	1.4	13.1
DKA43-22	2964	2553	2417	3467	2763	1.38	12.7
TS 4010	3127	2353	2056	3919	2702	1.35	13.1
DKA34-17RR	2237	2910	2158	3698	2632	1.32	13.3
Average	3200	3018	2672	4309	3300	1.65	13.3
LSD (0.05)	766	811	865	927	367	0.18	--
CV (%)	17	19	23	15	19	--	--

Crude Protein reported from 2013, 2014 trial data

* Varieties in bold statistically similar at a 95% confidence level

** Legendary XHD tested as FG 46M126

***Venus 4 PLUS T tested as TS 4013

Table 5. Alfalfa variety performance results at Lewis County, 2013–2016.

Variety	2013	2014	2015	2016	4-Year Average		Crude Protein#
					-----lbs/acre-----	tons/acre	
							%
Rugged	3880	7144	5782	6153	5725	2.86	17.8
WL 355RR	4896	7157	5264	4725	5593	2.8	16.8
PGI 424	3880	6560	5535	5733	5391	2.7	17.9
MsSunstra - 803	3795	7254	7570	5086	5378	2.69	15.5
TS 4010	3792	6627	4926	5446	5288	2.64	16.4
PGI 215	3912	6745	5827	5131	5262	2.63	16.8
Venus 4 PLUS T***	3475	6629	6203	5681	5261	2.63	19
Big Sky Ladak	3082	6507	5899	6167	5252	2.63	14.7
Vernal	3302	6106	5156	5634	5014	2.51	16.1
Magnum - 7	3022	5454	6237	5774	4750	2.37	17.3
AgRMS-103	2974	5521	6130	5594	4696	2.35	15.6
Hybri Force - 2400	2560	5952	5342	5437	4650	2.32	13.3
Melton	2787	4646	6346	6182	4538	2.27	12.5
Shaw	1973	5160	6200	6431	4521	2.26	14.3
Legendary XHD**	2374	5928	4553	4782	4361	2.18	18.2
AgRMS-101	2632	4761	5016	5574	4322	2.16	17.2
AgRMS-102	2475	3130	4724	7274	4293	2.15	11
WL 354HQ	1811	5347	5329	5600	4253	2.13	15.3
BB-10-11	2107	4474	4854	6025	4202	2.1	15
WL 319HQ	2527	4360	5846	5532	4139	2.07	15.1
Spredor 5	1953	4706	5485	5735	4131	2.07	15.7
Dryland	2889	4745	5113	4752	4129	2.06	14.4
Cooper	2206	4921	6337	5243	4123	2.06	15.7
FGR47M312	2064	4400	4942	5444	3969	1.98	14.2
Whitney	2396	4287	4692	5085	3923	1.96	14.6
DKA43-22	2043	4366	5240	5124	3845	1.92	13.2
FG 27C102	1548	5186	3706	4719	3818	1.91	15.1
DKA34-17RR	2231	4842	4519	4367	3814	1.91	13.7
Maxi-Graze	2771	3868	4430	4728	3789	1.89	15.4
Graze N Hay 3.1RR	1583	4501	4976	5009	3697	1.85	15.4
FG 310M150	1924	4159	5136	4814	3632	1.82	13.9
4R200	1562	4251	5596	4635	3483	1.74	15.9
FGR48M137	1860	4062	4543	3897	3273	1.64	13.4
Average	2675	5265	5377	5379	4440	2.22	15.3
LSD (0.05)	1127	1495	1473	1696	829	0.41	--
CV (%)	30	19	20	22	23	--	--

Crude Protein reported from 2013, 2014 trial data

* Varieties in bold statistically similar at a 95% confidence level

** Legendary XHD tested as FG 46M126

***Venus 4 PLUS T tested as TS 4013

Table 6. Summary of Alfalfa Variety performance results for northern Idaho, 2013–2016.

Variety	8 site-years		Crude Protein [#]
	lbs/acre	tons/acre	%
Rugged	4241	2.12	16
Big Sky Ladak	4235	2.12	14.7
Magnum - 7	4224	2.11	15.4
Melton	4204	2.1	11.8
WL 355RR	4102	2.05	15
AgRMS-102	4072	2.04	11
MsSunstra - 803	4043	2.02	15.8
AgRMS-103	3996	2	13.7
Venus 4 PLUS T***	3993	2	16.5
Shaw	3865	1.93	12.3
PGI 424	3853	1.93	16.2
PGI 215	3800	1.9	15.5
Vernal	3710	1.86	14.6
AgRMS-101	3703	1.85	12.8
Hybri Force - 2400	3685	1.84	13.1
Cooper	3674	1.84	14.9
TS 4010	3672	1.84	14.7
BB-10-11	3621	1.81	15
WL 319HQ	3614	1.81	14.3
Whitney	3573	1.79	16.1
Dryland	3502	1.75	13.4
Legendary XHD**	3466	1.73	17
WL 354HQ	3453	1.73	15.3
Maxi-Graze	3383	1.69	13.9
Spredor 5	3362	1.68	14
FGR47M312	3355	1.68	12.8
FG 27C102	3223	1.61	14.4
Graze N Hay 3.1RR	3213	1.61	14
FG 310M150	3188	1.59	13.9
DKA43-22	3169	1.58	12.9
DKA34-17RR	3075	1.54	13.5
4R200	3062	1.53	13
FGR48M137	2981	1.49	13.2
Average	3646	1.82	14.3
LSD (0.05)	454	0.23	3.1
CV (%)	25	--	15

[#] Crude Protein reported from 2013, 2014 trial data

* Varieties in bold statistically similar at a 95% confidence level

** Legendary XHD tested as FG 46M126

***Venus 4 PLUS T tested as TS 4013

Table 7. Disease resistance notes for varieties tested in northern Idaho, 2013–2016.
(Ratings provided by variety developers and the National Alfalfa and Forage Alliance.)

Variety	Contact for	TD	WS	BW	VW	FW	AR1	PhyRR	AphRR1	AphRR2	SAA	PA	BAA	PL	SN	SRKN	NRKN	ME	CGT	SE	ST	RR
PGI 215*	Alforex Seeds	2																				
PGI 424	Alforex Seeds	4	2	HR	HR	HR	HR	HR	HR	R		R			HR		R					
Rugged	Alforex Seeds	3	2	HR	HR	HR	HR	HR	HR	MR		HR			MR				Y		G	
Graze N Hay																						
3.10RR	Croplan	3	2	HR	HR	HR	HR	HR	HR		R											R
Maxi-Graze	Croplan	2	2	HR	R	HR	R	HR	R										Y			
Magnum - 7	Dairyland	4	2	HR	HR	HR	HR	HR	HR	R		R			HR	R	HR					
DKA34-17RR	DeKalb	3	2	R	R	R	R	R	R	R												R
DKA43-22RR	DeKalb	4	3	HR	HR	HR	HR	HR	HR						HR		R	H				R
4R200	Eureka	4	2	HR	HR	HR	HR	HR	HR		MR				HR		R	H				R
Whitney	Eureka	4	3	HR	HR	HR	HR	HR			R	HR			HR		HR	H				R
FG 27C102	Forage Genetics	2	1	HR	HR	HR	HR	HR			R											
FG 310M150*	Forage Genetics																					
FG 46M126																						
(Legendairy XHD)	Forage Genetics	3	1	HR	HR	HR	HR	HR	HR		R	HR										
FGR47M312	Forage Genetics	4	2	HR	HR	HR	HR	HR	HR		R	R			R							R
FGR48M137 (RR)																						
Presteez)	Forage Genetics	3	1	HR	HR	HR	HR	HR	HR		R	HR			MR							R
WL 355RR	La Crosse Seed	4	2	HR	HR	HR	HR	HR	HR		HR	R			R							R

* Currently under testing for disease resistances

Disease Ratings: HR - Highly Resistant; R - Resistant; MR - Moderately Resistant

Condition, Disease, or Pest: FD - Fall Dormancy; WS - Winter Survival; BW - Bacterial Wilt; VW - Verticillium Wilt; FW - Fusarium Wilt; Anth1 - Anthracnose Race 1;

PhyRR - Phytophthora Root Rot; AphRR1 - Aphanomyces Root Rot Race 1; AphRR2 - Aphanomyces Root Rot Race 2; SAA - Spotted Alfalfa Aphid; PA - Pea Aphid;

BAA - Blue Alfalfa Aphid; PL - Potato Leafhopper; SN - Stem Nematode; SRKN - Southern Root Knot Nematode; NRKN - Northern Root Knot Nematode;

SN - Stem Nematode; ME - Multifoliolate Expression (H-High/M-Mod/L-Low); CGT - Continuous Grazing Tolerance (Y-Yes); SE - Standability Expression (R-

Resistance); ST - Salt Tolerance (G-Germination/F-Forage); RR - Roundup Resistance source R-RRR; H - 75–95% Hybrid

Table 7. (continued) Disease resistance notes for varieties tested in northern Idaho, 2013–2016.

(Ratings provided by variety developers and the National Alfalfa and Forage Alliance.)

Variety	Contact for	FD	WS	BW	VW	FW	AR1	PhyRR	AphRR1	AphRR2	SAA	PA	BAA	PL	SN	SRKN	NRKN	ME	CGT	SE	ST	RR
Cooper	MSU																					
Shaw	MSU				MR		MR	R	HR		R	R			MR		HR					
Spredor 5	Nexgrow Alfalfa	2	1	HR	HR	HR	HR	HR	HR		R	R									G	
Vernal	Public	2		R		MR										R						
WL319HQ	W-L Research	2	1	HR	HR	HR	HR	HR	HR		R	HR			MR			H				
WL354HQ	W-L Research	4	1	HR	HR	HR	HR	HR	HR	HR	HR	HR			R			H				
AgRMS-101*	AgResearch USA	4																				R
AgRMS-102*	AgResearch USA	4																				
AgRMS-103*	AgResearch USA	4																				
BB-10-11	USDA/ARS	2		HR		MR	S					MR										
Big Sky Ladak	Big Sky Wholesale Seeds	4	2	HR	HR	HR	HR	R			R	MR					HR					
Dryland	Dairyland Seeds	3		HR	LR	HR	MR	R									MR					
HybriForce - 2400	Dairyland Seeds	4	2	HR	HR	HR	HR	HR	HR			R			HR	R	HR				F	H
Melton		3		R	R			HR	R		MR	R			R		HR					
MsSunstra - 803		4	2	HR	HR	HR	HR	HR	HR	R		R			HR	R	HR					R
TS 4010*	Alforex Seeds																					
TS 4013* (Venus 4 PLUS T)	Alforex Seeds	4	2	HR	HR	HR	HR	HR	HR			R			MR							

* Currently under testing for disease resistances

Disease Ratings: HR - Highly Resistant; R - Resistant; MR - Moderately Resistant

Condition, Disease, or Pest: FD - Fall Dormancy; WS - Winter Survival; BW - Bacterial Wilt; VW - Verticillium Wilt; FW - Fusarium Wilt; Anth1 - Anthracnose Race 1;

PhyRR - Phytophthora Root Rot; AphRR1 - Aphanomyces Root Rot Race 1; AphRR2 - Aphanomyces Root Rot Race 2; SAA - Spotted Alfalfa Aphid; PA - Pea Aphid;

BAA - Blue Alfalfa Aphid; PL - Potato Leafhopper; SN - Stem Nematode; SRKN - Southern Root Knot Nematode; NRKN - Northern Root Knot Nematode;

SN - Stem Nematode; ME - Multifoliolate Expression (H-High/M-Mod/L-Low); CGT - Continuous Grazing Tolerance (Y-Yes); SE - Standability Expression (R-Resistance);

ST - Salt Tolerance (G-Germination/F-Forage); RR - Roundup Resistance source R-RRa; H - 75–95% Hybrid