



2016

Washington State Hay Growers Association

ALFALFA VARIETY

YIELD TRIALS

Conducted by Washington State University Extension

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Washington State Hay Growers Association

Alfalfa Variety Trials

Conducted by Washington State University Extension

Nine alfalfa trials were harvested for yield in irrigated central Washington State in 2016. The Washington State Hay Growers Association (WSHGA) sanctions the trials and contracts with Washington State University (WSU) Extension to conduct and report the research. Three conventional trials are conducted near Othello, WA and three conventional and three Roundup Ready™ (RR) trials near Pasco, WA.

The Othello site is located on the WSU Othello research farm 6 miles ESE of Othello, WA at Lat: N46°47'41 Lng: W119°02'33 and at an elevation of 1154 feet. The Pasco site is located on Garfield Road at Lat: N46° 28'999, Lng: W119° 06'852 and elevation of 870 feet.

The soils are a Shano silt loam (coarse-silty, mixed-mesic Xerollic Camborthids) at Othello, and a Sagehill very fine sandy loam (coarse-loamy, mixed, mesic Xerillic Camborthids) at the Garfield Road location. All trials were sprinkler irrigated throughout the April-October growing season. The frost-free (32°F) period at Othello averages 180 days and 209 days at Pasco.

Each trial is arranged in a randomized complete block (RCB) design with 4 replications. All are seeded at 22 lbs/ac in rows spaced 6 inches apart with a 1-foot inter-plot separation. Plot size is 4 x 15 feet. The trials contain some experimental entries that are not available for commercial planting. Forage yields are collected for each submitted entry for three years on each planting.

Coefficient of Variation or “CV” is estimated using statistics and gives an estimate of the variability in the field. The lower the number the less variation in the measurements taken and the more likely you can determine a significant difference between treatments. Least significant difference or “LSD” is used to determine if the varieties are statistically different from each other. If the difference between two treatment means is greater than the LSD then you can determine that one variety yielded greater than another with a high level of confidence (90% for LSD at 0.10). For the longest yield duration in the table, I highlight in yellow the yields of the varieties that yielded statistically similar to the highest yielding variety using the LSD method.

Tables 1 - 3 contain a summary of annual total of yields for alfalfa varieties since the fall planting in 2011 at the Pasco and Othello locations. Yields are presented in percent of mean of the test for ease of comparison. Table 4 is from: NAFA’s “Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties – 2017 Edition and previous editions”. For a complete copy of the NAFA document visit www.alfalfa.org/varietyLeaflet.php.

Forage yields for each harvest, total season yield for 2016 and the totals for all years of the trials from those planted in the fall of 2013 to date are reported in Tables 5 through 13. Yields are determined from whole plot fresh weights converted to a dry matter basis using a constant dry matter fraction of 20%. Ratings for regrowth after 5th cutting were taken on October 11, 2016, respectively, and represent visual ratings from 1-5. Rating scale was: 1 - little to no regrowth, 2 – below average regrowth, 3 - average regrowth, 4 - above average regrowth, and 5 - high amount of regrowth.

At the end of each experiment final stands were evaluated for percent stand. This was determined by visually determining how many 6 inch gaps were found between plants in each of the seeded rows compared to the number of 6 inch blocks there are in a plot and calculating the percentage.

The WSHGA-WSU goal for the alfalfa variety testing project is to identify varieties for growers that are adapted to the Columbia Basin region that will tolerate both biotic (pests) and abiotic (environmental) stresses.

The spring and early summer of 2016 was very warm early allowing 5 cuttings. The weather was below normal temperatures from mid-summer through fall.

I want to especially thank Javier Ramos and Alfredo Torres for their assistance with this year's trials and planting of next years trials. I also want to thank the Washington State Hay Growers Association and Washington State University Extension for their continued support.

Please don't hesitate to contact me if you have any questions on the trials.

Sincerely,

A handwritten signature in black ink that reads "Steve Norberg". The signature is written in a cursive style with a large, prominent "S" at the beginning and a long, sweeping underline that extends under the name.

Table 1. 2016 Summary of Conventionally Sprayed Alfalfa Yield Trials Planted Since Fall of 2011 - Othello, WA

Entry	Seeded August 2011				Seeded August 2012				Seeded August 2013				6 YR Avg. of	6 YR Avg. of	6 YR Avg. of
	2012	2013	2014	3 Yr.	2013	2014	2015	3 Yr.	2014	2015	2016	3 Yr.	2011 & 2012 Trials	2011 & 2013 Trials	2012 & 2013 Trials
12005									105.1%	96.7%	86.9%	97.5%			
4R200	111.6%	101.6%	104.2%	105.7%											
55Q27					106.5%	108.4%	110.7%	108.4%							
6305Q	96.4%	105.7%	105.9%	102.7%											
6422Q															
6585Q									105.6%	104.9%	113.1%	107.4%			
AmeriStand 407TQ	99.8%	104.9%	104.5%	103.1%											
AmeriStand 427TQ									98.4%	101.6%	106.6%	101.6%			
AmeriStand 445NT	115.8%	110.3%	108.2%	111.3%					98.5%	103.7%	104.5%	101.8%		106.6%	
Camas	102.7%	106.9%	109.6%	106.4%	95.0%	108.2%	105.8%	102.6%	96.0%	94.2%	101.2%	98.8%	104.5%	102.6%	100.7%
CB001	102.8%	98.7%	101.4%	100.9%	96.7%	94.2%	97.9%	96.2%					98.6%		
CB11001					100.4%	98.6%	98.3%	99.2%							
CB11011					98.2%	95.1%	86.5%	93.6%							
CW 104038					98.2%	96.1%	94.5%	96.4%							
DG4210	92.9%	85.1%	84.8%	87.5%	105.7%	110.7%	108.8%	108.3%	103.6%	100.7%	100.9%	101.9%	98.0%	94.7%	105.1%
DKA 34-17 RR	104.6%	102.0%	100.1%	102.2%											
DKA 41-18 RR	101.7%	96.7%	99.3%	99.2%											
DKA 43-13					101.6%	105.5%	105.3%	104.0%							
DKA 43-22 RR	108.7%	102.6%	103.7%	104.9%											
DKA 50-18					99.7%	105.2%	108.9%	104.3%							
DSB01-T	105.9%	91.5%	90.5%	95.8%											
DSB08-M	110.1%	101.9%	94.8%	102.2%											
DSD01-T									110.4%	111.2%	118.1%	112.8%			
DSD06-M									104.7%	103.0%	103.9%	103.9%			
Enhancer II	106.3%	97.1%	90.8%	98.6%											
FGI 48W201	101.9%	104.4%	102.2%	102.9%											
FGI 48W202	94.2%	102.4%	107.0%	101.2%											
FGI R58HG236	100.2%	100.4%	106.0%	102.2%											
FSG403LR									102.7%	106.8%	98.1%	102.7%			
FSG423ST									98.9%	97.7%	90.2%	96.1%			
FSG424									96.9%	97.5%	101.4%	98.3%			
GrandStand	100.3%	104.6%	106.5%	103.8%					96.7%	98.4%	98.5%	97.7%		100.8%	
Gunner	114.1%	114.7%	114.9%	114.6%											
HybriForce-3400	114.0%	99.2%	92.8%	101.9%											
LegenDairy 5.0	101.2%	102.6%	103.4%	102.4%											
Magnum 7	109.7%	99.3%	100.3%	103.0%	111.5%	103.4%	103.3%	106.3%					104.6%		
MasterPiece II	103.8%	104.3%	105.0%	104.4%	104.7%	103.0%	103.6%	103.8%					104.1%		
Nimbus									101.4%	103.3%	111.6%	104.8%			
PGI 424	103.2%	100.1%	101.1%	101.1%											
Rebound 6.0	103.0%	105.2%	104.7%	104.3%											
Seneca					100.8%	102.6%	100.1%	101.2%							
Vernal					81.9%	82.6%	83.1%	82.5%	82.0%	81.0%	71.8%	78.9%			80.7%
Vernema					97.7%	89.0%	90.6%	92.7%	99.1%	99.4%	93.2%	97.6%			95.2%
Whitney					101.4%	97.6%	102.3%	100.4%							
WL 354HQ	104.8%	109.5%	112.6%	109.0%											
AV-T/AC	9.81	9.52	9.13	27.62	11.60	10.26	9.70	31.55	12.03	9.42	8.07	29.52			
LSD Years 11 (0.05)	9.8%	7.7%	9.1%	8.1%	7.5%	5.7%	7.3%	5.6%	6.3%	8.2%	10.5%	8.3%			
Years 12- 16 (0.10)															
CV (%)	7.9%	5.4%	6.5%	5.8%	6.3%	4.7%	6.1%	4.7%	5.3%	6.9%	7.4%	5.8%			

Table 2. 2016 Summary of Conventionally Sprayed Alfalfa Yield Trials Planted Since Fall of 2011 - Franklin County, WA

Entry	Seeded August 2011				Seeded August 2012				Seeded August 2013				6 YR Avg.		6 YR Avg.		6 YR Avg.	
	2012	2013	2014	3 Yr.	2013	2014	2015	3 Yr.	2014	2015	2016	3 Yr.	Seeded 11 & 12	Seeded 11 & 13	Seeded 12 & 13			
12005									100.5%	107.5%	101.0%	103.3%						
55Q27					99.4%	104.9%	99.7%	101.3%										
6401N					100.3%	101.4%	101.8%	101.1%										
6422Q	107.7%	104.5%	105.5%	105.8%														
6585Q									102.5%	100.8%	103.7%	102.2%						
6R100	102.7%	100.1%	99.3%	100.5%														
AmeriStand 407TQ	103.2%	100.5%	100.4%	101.2%														
AmeriStand 427TQ									92.8%	94.9%	100.6%	96.2%						
AmeriStand 445NT	108.6%	104.1%	106.8%	106.3%	100.8%	101.0%	103.2%	101.7%	105.9%	106.1%	115.5%	109.2%	104.0%	107.8%	105.5%			
Camas	103.1%	100.0%	105.8%	102.9%	103.7%	103.1%	101.1%	102.7%	103.7%	105.6%	109.5%	106.4%	102.8%	104.7%	104.6%			
CB11001					106.1%	99.1%	104.1%	103.1%										
CB11011					91.8%	98.5%	104.0%	98.0%										
CB9003					96.1%	100.4%	103.0%	99.7%										
CW 085028					99.5%	107.4%	97.7%	101.5%										
DG 4210	102.0%	93.0%	98.1%	97.3%	103.2%	99.2%	96.3%	99.7%	105.9%	96.7%	92.9%	98.0%	98.5%	97.7%	98.9%			
DKA 41-18 RR	109.3%	99.5%	97.0%	101.4%														
DKA 43-13					99.6%	99.5%	97.9%	99.0%										
DKA 43-22 RR	105.4%	103.5%	104.0%	104.2%														
DKA 50-18					101.5%	100.1%	96.9%	99.6%										
FGI 48W201	104.3%	98.5%	106.1%	102.8%														
FGI 48W202	101.3%	103.9%	102.7%	102.8%														
FGI 59W212	102.2%	100.9%	99.3%	100.7%														
FGI R58HG236	101.4%	101.6%	105.7%	102.9%														
FSG524									104.8%	107.8%	110.4%	106.4%						
GrandStand	101.2%	103.4%	97.7%	100.8%					100.6%	100.3%	98.6%	99.8%		100.3%				
Gunner					96.5%	101.2%	94.7%	97.4%										
HybriForce-2600	109.5%	104.0%	103.2%	105.3%	97.2%	91.0%	96.2%	94.8%					100.1%					
Integra 8420					101.1%	98.6%	97.8%	99.2%										
L455HD									99.1%	100.6%	98.4%	99.4%						
LegenDairy 5.0	105.1%	100.8%	98.3%	101.2%														
MasterPiece II	109.3%	101.9%	96.5%	102.1%	101.2%	100.3%	104.7%	102.1%					102.1%					
Nimbus									104.6%	103.1%	104.0%	103.8%						
PGI 557	109.2%	102.2%	103.2%	104.5%														
Rebound 6.0	103.8%	100.9%	101.6%	102.0%	102.6%	100.2%	98.0%	100.3%					101.2%					
Vernal									84.9%	83.2%	75.0%	80.9%						
Vernema									94.9%	93.3%	90.6%	92.8%						
Whitney					101.5%	94.3%	100.8%	98.9%										
WL354HQ	107.2%	107.1%	107.1%	107.1%	97.9%	99.8%	102.1%	99.9%					103.5%					
AV-T/AC	7.84	10.39	9.71	27.94	11.40	10.66	10.70	32.75	7.47	10.07	10.08	27.65						
LSD Years 11 (0.05)	8.8%	9.0%	5.9%	4.9%	5.1%	5.6%	NS	NS	8.4%	6.9%	10.6%	6.8%						
Years 12- 16 (0.10)																		
CV(%)	6.2	6.3	8.3	6.9	4.3	4.8	4.8	4.3	7.0	4.9	8.8	5.6						

Table 3. 2016 Summary of Roundup Sprayed Alfalfa Yield Trials Planted Since 2012 - Franklin County, WA

Entry	Seeded August 2012				Seeded August 2013				6 YR Avg.
	2013	2014	2015	3 Yr.	2014	2015	2016	3 Yr.	Seeded 12 & 13
428RR					100.6%	101.4%	101.3%	101.1%	
4R200	102.0%	102.1%	105.0%	103.2%	101.7%	103.8%	102.7%	102.8%	103.0%
55VR05	97.7%	97.8%	98.9%	98.0%					
6516R	99.9%	100.0%	104.0%	101.6%					
6547R	104.2%	104.3%	100.9%	101.5%					
AmeriStand 415NT RR	99.3%	99.3%	97.7%	99.4%					
AmeriStand 455TQ RR	101.8%	101.9%	100.5%	100.8%					
DKA 41-18 RR					99.1%	99.9%	99.4%	99.5%	
DKA 43-22 RR	98.2%	98.3%	99.2%	98.1%	102.1%	100.9%	102.2%	101.7%	99.9%
DKA 44-16 RR	98.7%	97.5%	99.2%	99.0%	100.7%	98.0%	98.8%	99.1%	99.1%
FG R49A132					95.8%	96.0%	95.7%	95.8%	
Integra 8444RR	96.6%	96.7%	95.6%	96.8%					
Mutiny	99.0%	99.1%	103.0%	101.6%					
RR AlphaTron	99.7%	99.8%	97.6%	99.4%					
RR NemaStar	102.7%	102.8%	98.4%	98.8%					
RR Tonnica	100.6%	100.7%	99.1%	100.2%					
WL 356HQ.RR	96.1%	96.1%	100.9%	99.9%					
WL 372HQ.RR	103.6%	103.7%	100.1%	101.7%					
AV-T/AC	11.30	10.43	10.68	32.42	9.28	10.38	10.25	29.90	
LSD (0.10)	4.2%	3.7%	NS	3.1%	NS	NS	NS	NS	
CV(%)	3.5	3.6	5.7	2.9	3.3	4.9	5.1	3.8	

Table 4. Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties in these Trials*

Variety	Marketing	FD	WS	BW	VW	FW	AN	PRR	APH1	SAA	PA	BAA	SN	SRKN	NRKN	Salt	Tech.
55Q27	Pioneer	5		HR	HR	HR	HR	HR	HR	R	R		HR				C
55VR05	Pioneer	5		HR	HR	HR	HR	HR	HR	R	R		HR		HR		R
6401N	NEXGROW	4		HR	HR	HR	HR	HR	R	R	HR		HR		HR	G	C
6516R	NEXGROW	5		HR		HR	HR	HR	HR	HR	HR		HR		HR	G	R
6547R	NEXGROW	5		HR	R	HR	HR	HR	HR		R		HR		HR	G/F	R
6585Q	NEXGROW	5	2	HR	HR	HR	HR	HR	HR		R		HR				C
AmeriStand 407TQ	America's Alf.	4	2	HR	HR	HR	HR	HR	HR	R	HR		HR		R		C
AmeriStand 415NT RR	America's Alf.	4		HR	HR	HR	HR	HR	HR		HR		HR		HR	G	R
AmeriStand 427TQ	America's Alf.	4	1	HR	HR	HR	HR	HR	HR		R		HR			G	C
AmeriStand 445NT	America's Alf.	4	2	HR	R	HR	HR	HR	R	HR	R		HR		HR		C
AmeriStand 455TQ RR	America's Alf.	4	2	HR	HR	HR	HR	HR	HR		R		R		HR	G	R
Camas	Eureka	4		HR	R	HR	HR	HR	HR	HR	R		HR		HR		C
DG 4210	CPS	4	1	HR	HR	HR	HR	HR	HR	HR	R		R				C
DG 5315	Dyna-Gro	5	3	HR	HR	HR	HR	HR	HR		HR		HR				C
DKA34-17RR	DeKalb	3	2	HR	HR	HR	HR	HR	HR		HR		R		R		R
DKA40-51RR	DeKalb	4	1	HR	HR	HR	HR	HR	HR	R			R				R
DKA41-18RR	DeKalb	4	2	HR	HR	HR	HR	HR	HR	HR	HR		R		R		R
DKA43-13	DeKalb	4	1	HR	HR	HR	HR	HR	HR		R		R		R		C
DKA43-22RR	DeKalb	4	2	HR	HR	HR	HR	HR	HR				HR		R		R
DKA44-16	DeKalb	4	2	HR	HR	HR	HR	HR	HR	R	R		R			G	R
DKA50-18	DeKalb	5	2	HR	HR	HR	HR	HR	HR	R	R		R				C
FSG 403LR	Allied	4		HR	HR	R	HR	HR	HR	R	R		R				C
FSG 423ST	Allied	4	2	HR	HR	HR	R	HR	R		R		R	R	HR	G/F	C
FSG 426	Farm Science	4	2	HR	HR	HR	HR	HR	HR	MR	HR						C
FSG 524	Allied	5	1	HR	HR	HR	HR	HR	HR		R		R				C
GrandStand	CPS	4	1	HR	HR	HR	HR	HR	HR	R	HR		MR		R		C
Grandstand II	Dyna-Gro	4	2	HR	HR	HR	HR	HR	HR		R		HR				C
GUNNER	Croplan	5	1	HR	HR	HR	HR	HR	HR		R		R		HR		C
Hi-Gest 360	Alforex	3		HR	HR	HR	HR	HR	HR			R					C
Hi-Gest 660	Alforex	6		R	MR	HR	HR	R				R					C
HybriForce-2600	Dairyland	6	2	HR	R	HR	HR	HR	R		R		HR	R	HR		H
HybriForce-3400	Dairyland	4	2	HR	HR	HR	HR	HR	HR		R		HR	R	HR		H
Integra 8420	Wilbur-Ellis	4		HR	HR	HR	HR	HR	HR	HR	R		HR		HR		C
Integra 8444R	Wilbur-Ellis	4		R	HR	HR	HR	HR	R	HR			HR		R	G/F	R
LegenDairy 5.0	CropPlan	3	1	HR	HR	HR	HR	HR	HR	R	R		MR		R		C
Magnitude	Allied	4	2	HR	HR	HR	HR	HR	HR	R	R		HR			G	C
Magnum 7	Dairyland	4	2	HR	HR	HR	HR	HR	HR		R		HR	R	HR		C
MasterPiece II	J.R. Simplot	5		HR	HR	HR	HR	HR	HR		HR		HR		R		C
Mutiny	NEXGROW	4	2	HR	HR	HR	HR	HR	HR				HR		R		R
Nimbus	Croplan	5		HR	R	HR	HR	HR	HR		HR		HR		HR	F	C
PGI 424	Alforex	4	2	HR	HR	HR	HR	HR	R		R		HR		R		C
PGI 557	Alforex	5	2	HR	HR	HR	HR	HR	HR		R	R	HR		HR		C
Rebound 6.0	Croplan	4	1	HR	HR	HR	HR	HR	HR	HR	R		R				C
RR AphaTron 2XT	Croplan	4	2	HR	HR	HR	HR	HR	HR		R		R				R
RR NemaStar	Croplan	5		HR	HR	HR	HR	HR	HR	R	R		HR		R	G	R
RR Tonnica	Croplan	5	2	HR	HR	HR	HR	HR	HR		R		R			G	R
RR501	Monsanto	5	2	HR		HR	HR	HR	HR		HR		HR			G/F	R
RRALF 4R200	Eureka	4	2	HR	HR	HR	HR	HR	HR	MR			HR		R		R
Seneca	CPS	4	2	HR	HR	HR	HR	HR	HR		R		MR		R		C
SGS 47M	J.R. Simplot	4	2	HR	HR	HR	HR	HR	HR		R		R				C
SW 4107	S & W	4		HR	HR	HR	HR	HR	HR	MR	R		R				C
SW 5213	S & W	5		HR	HR	HR	HR	HR	HR								
Vernal	Public	2		R	S	MR	S	S	S				SN		MR		C
Vernema	Public	4		MR	MR		LR	LR		MR			HR				C
Whitney	Eureka Seeds, Inc.	4	3	HR	HR	HR	HR	HR		R	HR		HR		HR		C
WL 354HQ	W-L Research	4	1	HR	HR	HR	HR	HR	HR	HR	HR		R				C
WL 356HQ.RR	W-L Research	4	1	HR	HR	HR	HR	HR	HR	MR	R		HR			G	R
WL 365HQ	W-L Research	5	1	HR	HR	HR	HR	HR	HR	HR	HR		R				C
WL 372HQ.RR	W-L Research	5	2	HR	HR	HR	HR	HR	HR	R	R		HR				R

FD Fall Dormancy
WS Winter Survival
BW Bacterial Wilt
VW Verticillium Wilt

FW Fusarium Wilt
AN Anthracnose Race 1
PRR Phytophthora Root Rot

SAA Spotted Alfalfa Aphid
PA Pea Aphid
BAA Blue Alfalfa Aphid
SN Stem Nematode

APH¹ Aphanomyces Race 1
SRKN Southern Root Knot Nematode
NRKN Northern Root Knot Nematode

* NAFAs "Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties - 2015 Edition and previous editions". For a complete copy of the NAFAs document visit www.alfalfa.org/varietyLeaflet.php. Blanks mean adequate testing has not yet occurred. Only data from publications were used.

Table 5. Three-Year Forage Yield - 2013 Alfalfa Variety Trial, Othello, Adams County, WA
Forage Yield (Ton DM/A)

Planted August 9, 2013		Fall	2014		2015		2016 Harvests						Total of		Percent	
Company	Entry	Dorm.	Harvests		Harvests		18-May	20-Jun	20-Jul	18-Jul	14-Sep	Total		2014 - 2016		Stand
		Rating	Total	% Mean	Total	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Total	% Mean	Total	% Mean	26-Sep-16
Dairyland Seed	DSD01-T*	4	13.29	110.4%	10.48	111.2%	2.81	2.47	1.96	1.64	0.64	9.53	118.1%	33.29	112.8%	91.79
Nexgrow	6585Q	5	12.71	105.6%	9.89	104.9%	2.46	2.41	1.86	1.66	0.73	9.12	113.1%	31.71	107.4%	92.14
Croplan Genetics	Nimbus	5	12.21	101.4%	9.74	103.3%	2.41	2.40	1.87	1.58	0.74	9.00	111.6%	30.94	104.8%	91.55
Dairyland Seed	DSD06-M*	4	12.60	104.7%	9.71	103.0%	2.63	2.21	1.68	1.37	0.48	8.38	103.9%	30.69	103.9%	92.98
Allied Seed LLC	FSG403LR*	4	12.36	102.7%	10.06	106.8%	2.50	2.11	1.57	1.31	0.42	7.91	98.1%	30.33	102.7%	91.67
Crop Protection Services	DG 4210	4	12.47	103.6%	9.49	100.7%	2.40	2.31	1.60	1.35	0.48	8.14	100.9%	30.09	101.9%	93.33
America's Alfalfa	AmeriStand 445NT	4	11.86	98.5%	9.77	103.7%	2.49	2.26	1.72	1.38	0.58	8.43	104.5%	30.05	101.8%	92.98
America's Alfalfa	AmeriStand 427TQ	4	11.84	98.4%	9.57	101.6%	2.56	2.24	1.75	1.42	0.62	8.60	106.6%	30.01	101.6%	94.17
Allied Seed LLC	FSG424*	4	11.66	96.9%	9.19	97.5%	2.28	2.21	1.68	1.44	0.58	8.18	101.4%	29.03	98.3%	93.45
Crop Protection Services	GrandStand	4	11.64	96.7%	9.27	98.4%	2.47	2.17	1.60	1.28	0.42	7.95	98.5%	28.86	97.7%	93.21
WA Seed Certif.	Vernema	4	11.92	99.1%	9.36	99.4%	2.51	1.93	1.45	1.21	0.42	7.52	93.2%	28.81	97.6%	91.07
Precision Seeds	12005	4	12.65	105.1%	9.11	96.7%	2.23	1.98	1.40	1.08	0.32	7.01	86.9%	28.77	97.5%	92.26
Eureka Seeds	Camas	4	11.56	96.0%	8.88	94.2%	2.09	2.25	1.69	1.48	0.65	8.16	101.2%	28.59	96.8%	91.90
Allied Seed LLC	FSG423ST*	4	11.90	98.9%	9.21	97.7%	2.33	1.92	1.46	1.18	0.38	7.27	90.2%	28.38	96.1%	92.50
WA Seed Certif.	Vernal	2	9.87	82.0%	7.63	81.0%	2.06	1.49	1.09	0.93	0.23	5.79	71.8%	23.29	78.9%	92.62
	Mean	4.0	12.03	100.0%	9.42	100.0%	3.48	2.55	2.23	1.17	0.51	8.07	100.0%	29.52	100.0%	92.51
	CV %		5.3	5.3	6.9	6.9	9.4	7.7	8.0	10.0	16.4	7.4	7.4	5.8	5.8	2.0
	LSD 10%		0.76	6.3%	0.77	8.2%	0.33	0.24	0.19	0.19	0.12	0.85	10.5%	2.46	8.3%	NS

* Entered as Experimentals

Table 6. Three-Year Forage Yield - Fall 2013 Planting, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)

Planted August 15, 2013		Fall	2014**		2015		2016 Harvests					3 Year Totals		Percent		
Company	Entry	Dorm.	Harvests		Harvests		10-May	15-Jun	19-Jul	17-Aug	15-Sep	Total		2014 - 2016		Stand
		Rating	Tons/a	% Mean	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	23-Sep-16
America's Alfalfa	AmeriStand 445NT	4	7.95	105.9%	10.69	106.1%	3.12	2.36	2.18	1.78	1.02	10.45	115.5%	29.09	109.2%	87
Allied Seed LLC	FSG524**	5	7.86	104.8%	10.86	107.8%	2.93	2.24	2.18	1.72	0.92	9.99	110.4%	28.72	107.8%	84
Eureka Seeds	Camas	4	7.78	103.7%	10.64	105.6%	2.97	2.24	2.04	1.68	0.98	9.91	109.5%	28.33	106.4%	92
Croplan Genetics	Nimbus	5	7.85	104.6%	10.39	103.1%	2.79	2.14	2.03	1.57	0.89	9.41	104.0%	27.65	103.8%	88
Precision Seeds	12005*	4	7.54	100.5%	10.83	107.5%	3.04	1.97	1.93	1.51	0.69	9.14	101.0%	27.51	103.3%	92
Nexgrow	6585Q	5	7.67	102.3%	10.16	100.8%	2.84	2.09	1.98	1.59	0.88	9.39	103.7%	27.22	102.2%	87
Crop Protection Services	GrandStand	4	7.54	100.6%	10.10	100.3%	2.81	1.98	1.89	1.48	0.76	8.92	98.6%	26.57	99.8%	85
Legacy Seeds	L-455HD	4	7.43	99.1%	10.13	100.6%	2.85	1.97	1.83	1.49	0.78	8.91	98.4%	26.48	99.4%	88
Crop Protection Services	DG 4210	4	7.95	105.9%	9.74	96.7%	2.56	1.83	1.73	1.53	0.77	8.41	92.9%	26.09	98.0%	86
America's Alfalfa	AmeriStand 427TQ	4	6.96	92.8%	9.56	94.9%	2.67	2.04	1.89	1.65	0.86	9.11	100.6%	25.62	96.2%	89
Public	Vernema	4	7.12	94.9%	9.40	93.3%	2.63	1.88	1.52	1.46	0.71	8.21	90.6%	24.72	92.8%	86
Public	Vernal	2	6.37	84.9%	8.38	83.2%	2.41	1.49	1.35	1.06	0.47	6.79	75.0%	21.53	80.9%	89
	Mean	4.1	7.50	100.0%	10.07	100.0%	2.80	2.02	1.88	1.54	0.81	10.08	100.0%	27.65	100.0%	87.7
	CV %		7.0	7.0	4.9	4.9	8.4	10.7	11.0	14.0	16.3	8.8	8.8	5.6	5.6	2.7
	LSD 10%		0.63	8.4%	0.60	6.0%	0.28	0.26	0.25	0.26	0.16	0.96	10.6%	1.80	6.8%	3

* Entered as Experimentals

** In 2014 conventional herbicide injury was significant first year.

Table 7. Three-Year Roundup Ready Forage Yield - 2013 Alfalfa Variety Trial, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)

Planted August 15, 2013

Company	Entry	Dorm.	2014		2015		2016 Harvests						3 Year Totals		Percent Stand	
			Harvests		Harvests		10-May	15-Jun	19-Jul	15-Aug	15-Sep	Total		2014 - 2016		
			Rating	Tons/a	% Mean	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean		Tons/a
Eureka Seeds	4R200	4	9.44	101.7%	10.77	103.8%	2.86	2.47	2.21	1.88	1.10	10.53	102.7%	30.73	102.8%	87.5
Monsanto	DKA43-22RR	4	9.47	102.1%	10.46	100.9%	2.87	2.49	2.15	1.84	1.12	10.47	102.2%	30.40	101.7%	87.3
Allied Seed LLC	428RR	4	9.33	100.6%	10.52	101.4%	2.65	2.36	2.28	1.91	1.18	10.38	101.3%	30.23	101.1%	85.0
Monsanto	DKA41-18RR	4	9.19	99.1%	10.37	99.9%	2.82	2.39	2.09	1.78	1.11	10.18	99.4%	29.74	99.5%	85.6
Monsanto	DKA44-16RR	4	9.35	100.7%	10.17	98.0%	2.76	2.32	2.14	1.83	1.08	10.13	98.8%	29.64	99.1%	83.6
Forage Genetics	FG R49A132*	4	8.89	95.8%	9.96	96.0%	2.76	2.23	2.04	1.72	1.06	9.80	95.7%	28.66	95.8%	84.6
	Mean		9.28	100.0%	10.38	100.0%	2.79	2.38	2.15	1.83	1.11	10.25	100.0%	29.90	100.0%	85.6
	CV %		3.3	3.3	4.9	4.9	9.0	6.0	5.0	6.6	7.2	5.1	5.1	3.8	3.8	5.0
	LSD 10%		NS	NS	NS	NS	NS	NS	0.13	NS	NS	NS	NS	NS	NS	NS

* Entered as Experimental

Table 8. Two-Year Forage Yield - 2014 Alfalfa Variety Trial, Othello, Adams County, WA
Forage Yield (Ton DM/A)

Planted August 13, 2014		Fall	2015 Harvests		2016 Harvests						2016 & 2017		2016 Fall	
		Dorm.	Total		18-May	20-Jun	20-Jul	18-Aug	14-Sep	Total	Total	2 Yr. Total		Oct. 11
Company	Entry	Rating	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	Regrowth
Simplot Grower Solutions	SGS 47M	4	11.31	105.1%	3.02	2.68	2.19	1.91	0.95	10.75	111.0%	22.06	107.9%	4.8
Pioneer Hi-Bred	55Q27	5	10.97	101.9%	3.42	2.53	2.08	1.79	0.93	10.75	111.0%	21.72	106.2%	4.5
Eureka Seeds	Camas	4	10.81	100.4%	3.18	2.54	2.14	1.95	1.06	10.87	112.3%	21.68	106.0%	5.0
Allied	FSG 415BR	4	11.48	106.7%	3.25	2.37	1.95	1.66	0.78	10.01	103.4%	21.49	105.1%	3.3
W-L	WL354HQ	4	11.03	102.5%	3.09	2.58	2.05	1.78	0.90	10.41	107.5%	21.44	104.8%	4.5
Crop Production Services	FG 48W214*	4	10.85	100.8%	3.14	2.44	2.00	1.79	0.97	10.35	106.9%	21.20	103.7%	5.0
America's Alfalfa	AmeriStand 427TQ	4	10.55	98.0%	3.07	2.56	2.10	1.68	0.97	10.37	107.1%	20.92	102.3%	4.8
Allied	Magnitude	4	10.71	99.5%	3.09	2.46	2.09	1.68	0.87	10.19	105.2%	20.90	102.2%	4.0
S & W Seed Company	SW 4328	4	11.01	102.3%	3.06	2.26	1.88	1.56	0.75	9.52	98.3%	20.53	100.4%	3.5
S & W Seed Company	SW 4332*	4	10.93	101.5%	3.19	2.30	1.88	1.52	0.69	9.57	98.9%	20.50	100.3%	3.3
Alforex	Hi-Gest 360	3	10.68	99.2%	3.02	2.36	1.90	1.62	0.72	9.62	99.4%	20.30	99.3%	3.5
Precision Genetics	CB11007*	4	11.09	103.0%	2.73	2.26	1.83	1.56	0.74	9.12	94.1%	20.21	98.8%	4.3
Precision Genetics	CB11009*	4	10.97	101.9%	2.88	2.38	1.77	1.30	0.54	8.88	91.7%	19.85	97.1%	3.0
Vernema	Vernema	4	10.15	94.3%	2.64	1.83	1.49	1.33	0.54	7.84	81.0%	17.99	88.0%	2.3
Vernal	Vernal	2	8.92	82.9%	2.52	1.75	1.29	1.09	0.36	7.00	72.3%	15.92	77.9%	1.0
Mean			10.77	100.0%	3.02	2.35	1.91	1.61	0.79	9.68	100.0%	20.45	100.0%	3.8
CV %			4.3	4.3%	5.8	7.3	4.8	6.7	10.2	4.7	4.7	4.0	4.0	16.5
LSD 10%			0.56	5.2%	0.21	0.20	0.11	0.13	0.10	0.54	5.6%	0.98	4.8%	0.7

* Entered as Experimentals

Table 9. Two-Year Forage Yield - 2014 Conventional Alfalfa Variety Trial, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)

Planted August 21, 2014		Fall	2015 Harvests		2016 Harvests							2015-2016		Regrowth
Company	Entry	Dorm.	Total		10-May	15-Jun	19-Jul	17-Aug	15-Sep	Total		2 Year Total		Rating
		Rating	Tons/a	%	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	%	Tons/a	%	11-Oct-16
Pioneer Hi-Bred	55Q27	5	11.41	106.1%	3.12	2.65	2.42	2.02	1.16	10.70	106.0%	22.11	106.1%	3.25
Precision Genetics	CB11007*	4	11.33	105.3%	3.35	2.72	2.51	2.07	1.18	10.58	104.9%	21.91	105.1%	3.75
Pioneer Hi-Bred	55VR05**	5	11.26	104.6%	3.09	2.60	2.46	2.05	1.21	10.64	105.4%	21.89	105.0%	3.75
Crop Production Services	FG 48W214*	4	11.24	104.5%	3.30	2.68	2.49	2.13	1.27	10.63	105.3%	21.86	104.9%	5.00
Eureka Seeds	Camas	4	11.12	103.4%	3.61	2.78	2.63	2.33	1.35	10.55	104.5%	21.67	104.0%	5.00
S & W Seed Company	SW4332*	4	11.03	102.6%	3.36	2.46	2.19	1.89	1.01	10.27	101.8%	21.30	102.2%	2.50
Vernema	Vernema	4	11.06	102.8%	3.41	2.34	2.03	1.63	0.91	10.13	100.4%	21.19	101.6%	2.25
America's Alfalfa	AmeriStand 427TQ	4	10.74	99.9%	3.08	2.66	2.46	1.96	1.17	10.16	100.6%	20.90	100.2%	3.50
S & W Seed Company	SW4328	4	10.81	100.5%	3.35	2.45	2.19	1.75	0.97	10.05	99.6%	20.87	100.1%	3.00
Simplot Grower Solutions	SGS 47M	4	10.60	98.5%	2.87	2.69	2.47	2.16	1.27	10.11	100.2%	20.71	99.3%	3.00
Precision Genetics	CB11001*	4	10.55	98.1%	3.14	2.44	2.28	1.87	1.11	9.89	98.0%	20.44	98.0%	4.00
RR Check	Check	4	10.43	97.0%	2.89	2.37	2.27	1.92	1.08	9.77	96.8%	20.20	96.9%	3.00
Alforex	Hi-Gest 660	6	10.10	93.9%	2.95	2.32	2.37	2.08	1.35	9.68	95.9%	19.78	94.9%	5.00
Vernal	Vernal	2	8.91	82.8%	2.77	1.77	1.56	1.13	0.52	8.14	80.7%	17.06	81.8%	1.00
	Mean		10.76	100.0%	3.16	2.49	2.31	1.93	1.11	10.09	100.0%	20.85	100.0%	3.43
	CV %		6.3	6.3	9.4	5.5	5.8	7.2	8.7	6.8	6.8	6.5	6.5	10.0
	LSD 10%		0.81	7.5%	0.36	0.16	0.16	0.17	0.11	0.81	8.0%	1.62	7.8%	0.41

* Entered as Experimentals

** RR variety mistakenly planted in conventional trial

Table 10. Two-Year Forage Yield - 2014 Roundup Ready Alfalfa Variety Trial, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)

Planted August 20, 2014		Fall	2015		2016 Harvests							2015-2016		Regrowth
		Dorm.	Total		10-May	15-Jun	19-Jul	17-Aug	15-Sep	Total		2 Year Total		Rating
Company	Entry	Rating	Tons/a	%	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	%	11-Oct-16
Eureka Seeds	4R200	4	10.02	103.2%	3.36	2.55	2.23	2.09	1.31	11.54	103.6%	21.56	103.4%	5.00
Monsanto	DKA44-16RR	4	9.71	100.0%	3.39	2.44	2.24	2.14	1.35	11.56	103.7%	21.27	102.0%	4.50
Monsanto	DKA 43-22RR	4	10.02	103.2%	3.26	2.23	2.01	2.02	1.22	10.73	96.2%	20.74	99.5%	4.00
W-L	WL 356HQ.RR	4	9.41	97.0%	3.25	2.46	2.21	2.11	1.29	11.32	101.5%	20.73	99.4%	4.50
Monsanto	RR501	5	9.56	98.5%	3.17	2.27	2.17	2.07	1.30	10.98	98.5%	20.55	98.5%	5.00
Monsanto	DKA40-51RR	4	9.53	98.2%	3.19	2.36	2.08	1.91	1.21	10.74	96.4%	20.27	97.2%	3.75
Mean			9.71	100.0%	3.27	2.38	2.16	2.06	1.28	11.15	100.0%	20.85	100.0%	4.46
CV %			3.9	3.9	5.6	5.7	4.8	9.9	11.5	3.3	3.3	3.0	3.0	8.8
LSD 10%			NS	NS	NS	0.17	0.13	NS	NS	0.46	4.1%	0.77	3.7%	0.48

Table 11. One-Year Forage Yield - 2015 Alfalfa Variety Trial, Othello, Adams County, WA
Forage Yield (Ton DM/A)

Planted September 4, 2015

Company	Entry	Fall	2016 Harvests							2016 Fall
		Dorm. Rating	20-May Cut 1	20-Jun Cut 2	20-Jul Cut 3	18-Aug Cut 4	14-Sep Cut 5	Total Tons/a	Total % Mean	10/11/2016 Regrowth
Allied Seed	FSG 426	4	2.21	2.20	1.97	2.01	0.83	9.23	109.2%	5.0
S&W Seed Co.	SW4107	4	2.25	2.31	1.90	1.93	0.79	9.18	108.6%	3.8
S&W Seed Co.	SW5213	5	2.42	2.32	1.76	1.87	0.72	9.08	107.4%	4.3
Simplot Grower Solns	SGS 47M	4	2.03	2.21	1.96	1.98	0.78	8.96	105.9%	4.8
America's Alfalfa	AmeriStand 427TQ	4	2.32	2.07	1.89	1.79	0.77	8.84	104.5%	5.0
RR Check	RR Check	4	2.32	2.17	1.86	1.80	0.68	8.82	104.3%	3.8
America's Alfalfa	AmeriStand 455NT	4	2.42	1.91	1.69	1.65	0.62	8.29	98.1%	3.8
Forage Genetics	Grandstand II *	4	1.95	1.87	1.82	1.83	0.81	8.27	97.9%	5.0
S&W Seed Co.	SW5512Y	5	2.24	2.06	1.63	1.62	0.62	8.16	96.6%	3.3
Precision Genetics	CB1109*	4	2.41	2.04	1.64	1.54	0.52	8.16	96.5%	4.3
Conv. Check	Vernema	4	2.36	1.94	1.53	1.55	0.56	7.94	94.0%	3.0
Conv. Check	Vernal	2	1.98	1.49	1.32	1.35	0.38	6.51	77.0%	2.0
	Mean		2.24	2.16	1.75	1.74	0.67	8.45	100.0%	4.0
	CV %		5.7	12.1	7.0	6.5	7.7	5.4	5.4	10.4
	LSD 10%		0.15	0.30	0.15	0.14	0.06	0.55	6.5%	0.5

* Entered as Experimentals

Table 12. One-Year Forage Yield - 2015 Conventional Alfalfa Variety Trial, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)

Planted August 13, 2015		Fall	2016 Harvests							Regrowth
		Dorm.	10-May	15-Jun	19-Jul	17-Aug	15-Sep	Total		Rating
Company	Entry	Rating	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	11-Oct-16
Forage Genetics	FG 49W202*		3.06	2.70	2.73	2.38	1.51	12.38	108.2%	4.25
Wilbur Ellis	Integra 8420	4	3.27	2.73	2.59	2.31	1.46	12.37	108.2%	4.50
Forage Genetics	Grandstand II	4	2.88	2.68	2.70	2.43	1.55	12.23	107.0%	4.00
Forage Genetics	DG 5315	5	2.97	2.69	2.62	2.31	1.31	11.91	104.1%	4.50
S&W Seed Co.	SW4107	4	2.78	2.64	2.59	2.34	1.45	11.79	103.1%	3.00
Precision Genetics	CB1109	4	3.36	2.70	2.50	2.04	1.09	11.69	102.2%	3.00
W-L Alfalfa	WL 365HQ	5	2.66	2.63	2.56	2.23	1.34	11.43	99.9%	3.75
Eureka Seed	Camas	4	2.77	2.54	2.44	2.19	1.30	11.24	98.3%	4.50
S&W Seed Co.	SW5213	5	3.12	2.59	2.24	2.04	1.19	11.18	97.8%	3.00
S&W Seed Co.	SW5512Y	5	3.13	2.60	2.31	1.95	1.11	11.10	97.0%	3.00
Conv. Check	Vernema	4	3.23	2.28	2.16	1.93	1.16	10.76	94.1%	2.75
Conv. Check	Vernal	2	2.66	2.08	1.88	1.62	0.91	9.17	80.2%	1.25
Mean		4.2	2.99	2.57	2.44	2.15	1.28	11.44	100.0%	3.46
CV %			8.5	7.6	6.3	6.5	12.0	5.6	5.6	15.2
LSD 10%			0.30	0.23	0.18	0.17	0.18	0.77	6.7%	0.60

* Entered as Experimentals

**Table 13. One-Year Forage Yield - 2015 Roundup Ready Alfalfa Variety Trial, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)**

Planted August 13 , 2015

Company	Entry	Fall	2016 Harvests							Regrowth
		Dorm.	10-May	15-Jun	19-Jul	17-Aug	15-Sep	Total		Rating
		Rating	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	11-Oct-16
Eureka Seed	4R200	4	2.88	2.70	2.54	2.22	1.33	11.68	102.7%	4.75
Monsanto	DKA44-16RR	4	3.08	2.56	2.44	2.22	1.28	11.57	101.8%	4.00
Monsanto	RR501	5	2.82	2.55	2.52	2.22	1.41	11.52	101.3%	4.00
America's Alfalfa	AmerisStand 545NT RR	5	2.79	2.54	2.56	2.21	1.32	11.42	100.4%	4.25
Forage Genetics	FG R410W253*	5	2.70	2.41	2.41	2.22	1.38	11.12	97.8%	3.75
Wilbur Ellis	Integra 8401RR	4	2.92	2.48	2.31	2.00	1.20	10.91	95.9%	3.00
	Mean	4.5	2.87	2.54	2.46	2.18	1.32	11.37	100.0%	3.96
	CV %		8.4	4.3	4.6	5.9	8.9	4.3	4.3	9.5
	LSD 10%		NS	0.30	0.13	NS	NS	NS	NS	0.47

* Entered as Experimentals