

The Importance of Alfalfa and Alfalfa Variety Testing – By Steve Norberg, Ph.D., Regional Forage Specialist with Washington State University Extension

Alfalfa production, like every other business, is competitive in nature and every edge counts. Alfalfa is a high quality forage that is shipped around the world. Approximately half of the hay exports for the United States come from the Columbia Basin Area. About half of the hay grown in Washington is alfalfa with the balance being timothy, orchardgrass, teff and others. Each year the state of Washington Department of Agriculture ranks the top agriculture commodities. In 2011, the commodity they call “all hay”, which includes all species of hay as well as mixtures, came in ranked as number five in dollars generated. Two other major commodities milk and beef, ranked second and sixth, are very dependent on hay production for its production. All hay was estimated in generating \$714 million dollars for Washington.

To help keep the alfalfa hay industry strong Washington State University Extension in conjunction with the Washington State Hay Growers Association, has conducted alfalfa varieties trials for over 28 years in the Columbia Basin and 2012 was no exception. The Washington State Hay Growers Association coordinates and contracts with Washington State University Extension to conduct the trial. Private seed companies pay a fee to get their varieties tested head-to-head with their competitor’s varieties. The alfalfa variety trial lasts three years, which is similar to the length a typical farmer would keep his alfalfa stand. Each year a new trial is started and each year a three year old trial is finished. Annual results are given each year but the most important information comes at the completion of a trial. Trials are conducted at two locations, one at the WSU Othello Research Farm and one about 15 miles north of Pasco on Garfield Road to better simulate producers local variation in climate and soils. In 2009 about 20 varieties were planted in each location and the results can be seen below.

If you plant varieties that do well in our tests there is a higher likelihood that you will produce more hay on your farm and in the state of Washington. The biggest difference would occur when producers use this information to pick the highest yielding available cultivar instead of just randomly picking a variety that ended up being the poorest one. In this scenario, the difference between the three year total highest and lowest private company variety was 0.65 tons per acre per year in Othello and 0.86 tons per acre per year at the Pasco location. Assuming a hay price of \$225/ton this difference in yield would have meant \$146 more dollars per acre gross revenue per year at the Othello location and \$194 per acre per year at the Pasco location. This difference in gross revenue is a huge advantage to the hay and livestock producers.

Because this test is conducted by an unbiased source and the test is conducted scientifically, it gives producers a reason for confidence when they select an alfalfa variety. Having an independent unbiased source to conduct these trials other than Land Grant Based Universities such as Washington State University is rare if not impossible to find making this information even more valuable. The scientific method used is randomized locations of treatments with the field and replicated within the field, locations and years to insure accuracy. The L.S.D. statistic located at the bottom of each table shows how much difference is required to say the production in hay is different between any two varieties

with 95% accuracy. In table 1 the difference between the 3 year total has to be 1.53 tons per acre or greater for the two varieties to be different. Any difference less than 1.53 tons per acre could likely be caused by experimental error. I have highlighted the yields of those varieties that could not be separated from the highest yielding variety. So if a farmer selected one of the highlighted varieties over the ones that were not highlighted, the average yield difference between these groups would be 1.22 tons per acre of hay in Othello and 1.1 tons per acre in Pasco. If all 390,000 acres of alfalfa grown in 2012 increased their yield by 1.1 tons per acre, there would be 429,000 more tons of hay produced and at \$225/ton it would be worth 96.5 million dollars to the state of Washington. I encourage producers to select from the top of the high yielding varieties to possibly increase yields and profits even higher than this example.

The full results for the 2012 alfalfa variety test can be found at <http://www.wa-hay.org/publications/alfalfa-variety-yield-trials.html> . This information can also be found on the WSU Franklin County and WSU Grant County Extension websites.

Table 1. Three-Year forage yield from Fall 2009 Alfalfa Variety Trial, Othello, Grant County, WA. Hay yield is in tons of dry matter produced per acre.

Seeded 8/17/2009		2010	2010	2011	2011	2012 Harvests				2012	2012	3 - Year Total		2012 Final
Company	Entry	Total	% Mean	Total	% Mean	Harv. 5-28	Harv. 7-2	Harv. 8-3	Harv. 9-13	Total	% Mean	Total	% Mean	% Stand
CalWest Seeds	CW064004	4.68	103.4%	4.01	108.3%	3.01	2.59	1.98	1.73	9.30	110.7%	17.99	108.2%	86.07
FGI	FG 46W202	4.86	107.4%	3.81	102.9%	2.89	2.54	1.90	1.68	9.01	107.2%	17.67	106.3%	86.35
Croplan	Rebound 5.0	4.66	103.0%	3.73	100.7%	3.19	2.46	1.76	1.56	8.98	106.9%	17.36	104.4%	84.40
Wilbur-Ellis	Integra 8400	4.50	99.5%	3.91	105.6%	3.25	2.39	1.76	1.50	8.89	105.9%	17.31	104.1%	71.88
FGI	FG 46W201	4.67	103.3%	4.04	109.0%	2.80	2.31	1.79	1.63	8.53	101.6%	17.24	103.7%	86.07
WFS	GrandStand	4.75	105.1%	3.64	98.2%	3.07	2.45	1.78	1.54	8.83	105.2%	17.22	103.6%	87.14
CalWest Seeds	Summit	4.62	102.1%	3.50	94.5%	3.15	2.46	1.86	1.60	9.07	107.9%	17.18	103.3%	81.90
Wilbur-Ellis	Integra 8300	4.70	103.8%	3.70	99.9%	3.10	2.46	1.74	1.47	8.78	104.5%	17.17	103.3%	86.19
Producer's Choice	PGI 557	4.77	105.5%	4.16	112.4%	2.59	2.37	1.67	1.58	8.21	97.8%	17.15	103.1%	77.45
America's	AmeriStand 407TQ	4.42	97.6%	3.82	103.3%	2.87	2.49	1.76	1.66	8.78	104.5%	17.02	102.4%	76.26
Syngenta	64Q22	4.62	102.2%	3.53	95.2%	2.78	2.50	1.78	1.46	8.53	101.5%	16.68	100.3%	88.45
FGI	FG 45W273	4.44	98.2%	3.60	97.2%	2.72	2.31	1.87	1.56	8.46	100.7%	16.50	99.2%	69.29
W-L Research	WL 343 HQ	4.26	94.1%	3.81	103.1%	2.73	2.44	1.75	1.50	8.43	100.3%	16.50	99.2%	85.60
FGI	FG 45W271	4.45	98.4%	3.44	92.9%	2.84	2.32	1.77	1.59	8.53	101.5%	16.42	98.8%	85.83
Dairyland Seed Co.	HybriForce Exp 807	4.21	93.0%	3.83	103.5%	3.06	2.09	1.62	1.47	8.24	98.1%	16.27	97.9%	89.40
Mycogen Seeds	45417	4.66	103.0%	3.84	103.7%	2.66	2.02	1.72	1.29	7.69	91.5%	16.19	97.4%	86.67
Monsanto	DKA 42-15	4.42	97.7%	3.43	92.6%	2.92	2.05	1.69	1.44	8.09	96.3%	15.94	95.9%	88.45
Syngenta	63Q05	4.47	98.8%	3.26	88.2%	2.68	2.27	1.79	1.45	8.19	97.6%	15.93	95.8%	73.79
Allstar	Prosement	4.30	95.1%	3.88	104.9%	2.26	2.16	1.62	1.39	7.43	88.5%	15.62	93.9%	78.62
Dairyland Seed Co.	HybriForce Exp 802	4.23	93.6%	3.37	91.0%	2.86	1.90	1.48	1.31	7.54	89.8%	15.14	91.1%	87.86
Public	Vernal	4.31	95.3%	3.45	93.2%	2.64	1.68	1.43	1.14	6.89	82.0%	14.65	88.1%	82.80
	Mean	4.53	1.00	3.70	1.00	2.86	2.30	1.74	1.50	8.40	1.00	16.63	1.00	82.88
	CV %	10.8	10.8	12.6	12.6	8.9	5.8	6.0	7.0	5.4	5.4	6.5	6.5	17.4
	LSD 5%	NS	NS	NS	NS	0.36	0.19	0.15	0.15	0.64	7.6	1.53	9.2	NS

Table 2. Three year forage yield from Spring 2010 Garfield Alfalfa Variety Trial, Franklin County, WA. Hay yield is in tons of dry matter produced per acre.

	Seeded 4/15/10 Entry	2010 Harvest		2011 Total		2012 Harvests						2010-12		Final % Stand
		Total	% Mean	tons/a	% Mean	24-May Cut 1	2-Jul Cut 2	1-Aug Cut 3	12-Sep Cut 4	2012 Total		ton/a	%	
										tons/a	% Mean			
Sygenta	64Q22	3.12	100.0%	4.14	103.8%	2.90	2.50	2.41	1.86	9.66	113.8%	16.92	108.5%	86.79
Forage Genetics	FG 45W271	3.13	100.3%	4.20	105.3%	2.76	2.35	2.21	1.85	9.16	107.8%	16.48	105.7%	84.64
WL Research	WL 363 HQ	3.23	103.5%	4.07	102.1%	2.83	2.25	2.35	1.72	9.14	107.6%	16.44	105.4%	83.69
Forage Genetics	FG 45W273	3.14	100.5%	4.32	108.3%	2.79	2.19	2.14	1.66	8.79	103.5%	16.25	104.2%	87.14
Forage Genetics	FG 46W202	3.37	108.1%	3.98	100.0%	2.64	2.27	2.15	1.76	8.82	103.8%	16.18	103.7%	86.19
Simplot	MasterPiece II	3.11	99.6%	4.07	102.1%	2.58	2.37	2.28	1.74	8.97	105.6%	16.15	103.5%	86.19
Allstar	Prosementi	3.01	96.3%	4.55	114.3%	2.43	2.27	2.06	1.67	8.44	99.3%	16.00	102.6%	84.05
Western Farm S.	GrandStand	3.38	108.2%	3.95	99.2%	2.57	2.19	2.16	1.73	8.65	101.8%	15.98	102.4%	85.00
Producers Choice	PGI 557	3.03	96.9%	4.29	107.7%	2.64	2.35	2.00	1.59	8.58	101.0%	15.90	101.9%	85.00
America's	AmeriStand 407TQ	3.41	109.1%	4.19	105.1%	2.50	1.97	2.03	1.70	8.20	96.5%	15.79	101.3%	84.29
Wilbur-Ellis	Integra 8400	3.05	97.8%	4.04	101.3%	2.83	2.12	2.19	1.60	8.65	101.9%	15.74	100.9%	85.48
Cal/West Seeds	CW 064004	2.94	94.1%	4.12	103.4%	2.57	2.25	2.19	1.70	8.63	101.6%	15.69	100.6%	86.19
Dairyland Seed C.	Magna 551	3.35	107.2%	3.93	98.5%	2.65	2.19	2.04	1.62	8.41	99.0%	15.68	100.5%	85.60
America's	Archer III	3.00	96.2%	3.91	98.1%	2.77	2.33	2.13	1.53	8.75	103.0%	15.67	100.4%	86.07
Croplan	Mountaineer 2.0	3.42	109.5%	3.81	95.6%	2.73	2.12	1.85	1.61	8.31	97.9%	15.54	99.7%	87.38
Forage Genetics	FG 46W201	3.09	98.9%	3.91	98.0%	2.69	2.23	1.98	1.63	8.54	100.5%	15.53	99.6%	86.55
Dairyland Seed C.	HybriForce Exp 802	3.13	100.2%	4.08	102.4%	2.73	2.07	1.92	1.54	8.27	97.4%	15.48	99.2%	86.31
Cal/West Seeds	Summit	2.69	86.2%	4.06	101.9%	2.58	2.19	2.07	1.65	8.48	99.8%	15.23	97.6%	85.83
Mycogen Seeds	45417	3.40	108.9%	3.79	95.1%	2.56	2.09	1.77	1.46	7.87	92.7%	15.06	96.6%	86.55
Dairyland Seed C.	HybriForce Exp 807	3.05	97.6%	3.67	92.1%	2.73	1.93	1.83	1.42	7.91	93.1%	14.63	93.8%	84.52
Monsanto	DKA 42-15	2.88	92.3%	3.55	89.1%	2.46	2.00	1.92	1.52	7.90	92.9%	14.33	91.9%	85.71
Public	Vernal	2.76	88.5%	3.05	76.4%	2.40	1.53	1.53	1.18	6.75	79.4%	12.48	80.0%	82.98
	Mean	3.12	100.0%	3.98	100.0%	2.65	2.17	2.06	1.62	8.50	100.0%	15.60	100.0%	85.55
	CV%	8.5	8.5	9.2	9.2	9.4	9.4	7.3	6.6	5.3	5.3	4.6	4.6	2.4
	LSD 5%	0.38	12.3	0.52	13.1	NS	0.29	0.21	0.15	0.63	7.4	1.00	6.4	NS