



WASHINGTON STATE UNIVERSITY
EXTENSION

2023

Washington State Hay Growers Association

ALFALFA VARIETY TRIALS

QUALITY RESULTS

Conducted by Washington State University Extension

Steve Norberg¹, Obadiah Sheriff, Laurent Leonhard, and Steve Fransen

¹Regional Forage Specialist | Washington State University Extension | Franklin County Extension Office
404 West Clark Street. Pasco, WA 99301 | Phone: 509-545-3511 | E-mail: s.norberg@wsu.edu

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Nine alfalfa trials were harvested for yield in irrigated central Washington State in 2023. 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 trials are named by the year the fall planting occurred.**

For the 2020, 2021, and 2022 trials, 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, at an elevation of 1154 feet. The 2020 and 2021 Franklin County trials are located on land leased from the City of Pasco and called "City of Pasco" at Lat: 46°17'31.11"N and 119° 1'54.97" W with an elevation of 502 ft and near the City of Pasco Water Treatment Plant. A new Pasco site was established in August 2022 at 3128 Ivy Road, Pasco, WA at Lat: 46°17'51.01"N Lng: 119° 8'22.40"W with an elevation of 446 ft.

The very prolonged and cool spring in 2022 and 2023 reduced yields. Growing degree day units (GDD) until May 21st was 732, 459, 699 for 2021, 2022 and 2023, for Othello site and 955, 724 and 778 for Pasco sites, respectively. Taking five cuts in the cool year of 2023 also reduced yields. All first cuttings in Franklin County were harvested with a new harvester that increased variation and was not used again the rest of the year.

The soils are a Shano silt loam (coarse-silty, mixed-mesic Xerollic Camborthids) at Othello and a Quincy loamy fine sand (Xeric Torripsamments) at the City of Pasco and Pasco locations. All trials were sprinkler irrigated throughout the April-October growing season. Nozzle spacing is 30x40 feet with 9/64-inch nozzles. The frost-free (32°F) period at Othello averages 180 days and 209 days at Pasco.

The trials follow fertility recommendations found in the "Nutrient Management Guide for Dryland and Irrigated Alfalfa in the Inland Northwest" (PNW0611). Fields were fertilized with phosphorus and potassium in the fall of 2021. Conventional trials are sprayed after 3 tri-foliolate leaves appear after planting with imazamox with 2,4-DB and 0.25% NIS at establishment. Roundup Ready™ trials are sprayed with glyphosate at 16 oz./ac when the plants reach 3 trifoliolate leaves.

Each trial is arranged in a randomized complete block (RCB) design with 4 replications. All trials are planted at 22 lbs./ac in rows spaced 6 inches apart with a 1-foot inter-plot separation, total 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 every planting.

The 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. Analysis of Variance (ANOVA) is calculated and if variety is significant, the least significant difference (LSD) is calculated. The LSD is used to determine if the varieties are statistically different from each other. If the difference between the 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). In results where there is a variety is statistically significantly better than the worst entry, it is highlighted in yellow as well as those which cannot be separated from the best in the trial.

Tables 1 - 3 contain a summary of the annual total yields for alfalfa varieties from the fall planting in 2020 to 2022 at the Pasco and Othello locations. Yields are presented in percent of the mean of the test for ease of comparison. Table 4 is from National Alfalfa and Forage Alliance's (NAFA) "Winter Survival, Fall Dormancy &

Pest Resistance Ratings for Alfalfa Varieties – 2024 Edition and previous editions”. For a complete copy of the NAFA document visit <https://www.alfalfa.org/varietyratings.php>.

Forage yields for each harvest; total season yield for 2023 and the totals for all years of the trials from those planted in the fall of 2019 to date are reported in Tables 5 through 12. Yields are determined from whole plot fresh weights converted to a 100% dry matter basis using a constant dry matter fraction of 20%. Ratings for regrowth after the last cutting was taken on October 13th for both the City of Pasco and Othello locations and represent visual ratings from 1-5. Fall dormancy ratings for the Pasco location were done on October 13th. The 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. Although it is not a fall dormancy rating it does compare those in the trial for regrowth in the fall. 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 seeded row compared to the number of 6-inch blocks in a plot and calculating the percentage from the total number of 6-inch blocks in the plot.

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 and still yield well. This annual publication aims to provide growers and industry with the best, most reliable quality results possible. In 2020, Go Seed contacted me about the possibility of entering a Falcata alfalfa variety into the trials called GO-FU Falcata alfalfa. Falcata is a subspecies of alfalfa and is known for its drought tolerance and persistence in dryland situations and has yellow flowers instead of purple flowers in Sativa alfalfa which we typically grow that has purple flowers. I know of no other alfalfa trials in the U.S. that compares variety of Falcata alfalfa so I allowed it into the trial. If performed well for the first cutting and is high in quality but production lacks in the subsequent cuttings and this variety responded like a fall dormancy 1 or less in regrowth.

First cutting quality samples were funded by seed companies on the conventional trials for both Othello and Pasco locations and results can be seen in Tables 13 through 18. Only in experiments where enough entries occurred can we do hay quality testing. The method of determining nutrient and fiber value was used according to Dr. William Wiess, Nutritionist from The Ohio State University, who spoke on “Should forages be priced like a sack of nutrients” at 2019 Western Alfalfa and Forage Symposium and can be viewed at <http://lecture.ucanr.edu/Mediasite/Play/62cdb31981f745dba980dc695cf48ffa1d> and uses NDFD48 as for the value of adjustment. This method allows a total dollar value of hay to be calculated on each variety. The numbers given are based on an “as fed” basis with values based in the Midwest since none were available for the PNW. Values for protein, energy, fiber, and fiber-fill adjustment effect on dairy cow milk production. I used this method because it allows us to know what in the hay brings value to the dairy industry which is the main ultimate use of our high-quality hay. I would be happy to try to answer any questions on how the numbers were calculated.

I want to especially thank Obadiah Sheriff, Laurent Leonhard, and Steve Fransen, for their assistance with this year’s trials and planting of next year’s trials. I also want to thank the Washington State Hay Growers Association and Washington State University Extension for their continued support.

Please do not hesitate to contact me if you have any questions about the trials.

Sincerely,



Steve Norberg Ph.D.

Regional Forage Specialist

s.norberg@wsu.edu | 509-545-3511

Table 1. 2023 Summary of Conventionally Sprayed Alfalfa Yield Trials Planted Since Summer of 2018 at WSU Othello Research Farm, WA

Entry	Seeded August 2018				Seeded August 2019				Seeded August 2020				6 YR Avg. of	6 YR Avg. of	6 YR Avg. of
	2019	2020	2021	3 Yr.	2020	2021	2022	3 Yr.	2021	2022	2023	3 Yr.	2018 & 2019 Trials	2018 & 2020 Trials	2019 & 2020 Trials
54Q29					105.2	102.9	103.0	103.6%	97.8	105.3	102.5	101.9%			102.8%
6453Q									100.9	98.6	109.3	102.4%			
Ace*	100.6%	105.1%	97.3%	100.7%	107.7%	97.5	102.1	102.2%					101.5%		
AFX 439					105.0%	107.9%	107.3%	106.6%							
Stockpile II*					104.1%	102.3%	103.4%	103.2%							
AmeriStand 427TQ	98.8%	103.9%	106.9%	103.2%											
AmeriStand 428TQ									105.7%	111.4%	112.2%	109.6%			
AmeriStand 445NT	95.4%	98.4%	97.1%	96.9%											
AmeriStand 518NT					94.1%	95.9%	92.0%	94.1%							
DG 4120									101.0%	106.6%	112.1%	106.0%			
DG 4210*					100.3%	104.3%	105.3%	103.3%							
DG5315	108.2%	107.1%	107.5%	107.6%											
DKA44-18					100.4%	102.5%	107.2%	103.3%							
DKA50-17									97.9%	104.9%	108.5%	103.3%			
DynaGro Exp. #1	99.2%	99.7%	97.6%	98.8%											
F2F6C-418					103.3%	101.4%	101.6%	102.1%							
F2F6C-628					94.4%	100.0%	100.2%	98.3%							
FG C0415SN223*					93.6%	95.4%	99.5%	96.1%	98.4%	100.6%	115.4%	103.7%			99.9%
GO-FU Falcata Alfalfa									74.2%	58.7%	48.7%	62.4%			
HybriForce-3600					103.2%	101.6%	100.2%	101.7%							
LS - 04SJ									104.8%	101.3%	98.6%	102.2%			
LS - 06DR									102.1%	104.5%	104.5%	103.8%			
LS - 1508									101.8%	101.9%	105.1%	102.9%			
Magnum 8	96.3%	97.7%	100.4%	98.2%											
MPIII Max Q					99.1%	96.2%	96.2%	97.1%							
QuickGold*	109.3%	110.3%	100.3%	106.4%											
BYS-6086*					96.2%	94.6%	90.2%	93.7%							
SGS 47M					104.5%	102.9%	103.8%	103.7%							

Table 1. Continued. 2023 Summary of Conventionally Sprayed Alfalfa Yield Trials Planted Since Summer of 2018 at WSU Othello Research Farm, WA

Entry	Seeded August 2018				Seeded August 2019				Seeded August 2020				6 YR Avg. of	6 YR Avg. of	6 YR Avg. of
	2019	2020	2021	3 Yr.	2020	2021	2022	3 Yr.	2021	2022	2023	3 Yr.	2018 & 2019 Trials	2018 & 2020 Trials	2019 & 2020 Trials
Silverland GT 5									93.2%	91.0%	82.9%	90.1%			
Skylark	99.1%	95.7%	97.1%	97.4%											
Sureshot*	105.3%	105.5%	103.2%	104.6%											
SW4306									105.9%	108.2%	102.9%	106.3%			
SW 4412Y									102.8%	101.8%	98.3%	101.6%			
SW 5210					108.5%	106.4%	112.8%	109.1%							
SW 5207	108.1%	104.6%	98.7%	103.7%											
SW 5213	103.4%	99.9%	103.3%	102.3%	102.5%	105.2%	108.2%	105.3%							
SW 5520Y									104.4%	107.6%	109.7%	107.2%			
Swift	97.1%	95.0%	97.5%	96.6%											
Trifecta III*	108.0%	110.2%	111.1%	109.7%											
Vernal	78.0%	79.2%	90.7%	82.9%	78.3%	88.4%	83.9%	83.8%	84.2%	82.3%	74.7%	81.4%	83.4%	83.4%	82.6%
WL 349HQ					103.1%	103.3%	103.8%	103.4%							
WL 377HQ					99.2%	98.1%	97.8%	98.4%	104.1%	108.2%	110.1%	107.3%			102.9%
Avg. Total-Tons/Acre	9.40	7.80	9.60	26.8	9.21	10.60	8.95	28.8	11.25	10.37	7.14	28.7			
LSD (0.10)**	4.7%	6.4%	6.2%	4.6%	5.1%	4.6%	7.8%	5.0%	6.8%	8.3%	9.1%	6.6%			
CV (%)	3.9%	5.4%	5.2%	5.9%	6.1%	5.5%	9.2%	5.9%	5.7%	7.0%	7.7%	5.6%			

* Was originally submitted as an experimental

** If LSD number is given then it was significant at PR>F 0.10, if not then it was not significant (NS).

Table 2. 2023 Summary of Conventionally Sprayed Alfalfa Yield Trials Planted Since Fall of 2018 - Near Pasco, WA

Entry	Seeded August 2018				Seeded August 2019				Seeded August 2020				6 YR Avg. of	6 YR Avg. of	6 YR Avg. of
	2019	2020	2021	3 Yr.	2020	2021	2022	3 Yr.	2021	2022	2023	3 Yr.	2018 & 2019 Trials	2018 & 2020 Trials	2019 & 2020 Trials
457HD+*					101.6%	102.2%	92.6%	99.3%							
54Q29	96.2%	98.4%	97.2%	97.3%	99.1%	100.7%	112.5%	103.5%	107.6%	14.0%	101.9%	105.0%	100.4%	101.2%	104.3%
6585Q					96.9%	97.4%	97.3%	97.2%							
AFX 439*									101.6%	104.6%	102.5%	102.8%			
Stockpile II					107.1%	107.3%	108.2%	107.5%							
X-Force 5400*									112.2%	115.5%	111.3%	112.7%			
AFX175021*									90.0%	99.6%	102.6%	96.4%			
AmeriStand 428TQ									97.8%	97.5%	103.7%	99.2%			
CB1109*	105.6%	106.6%	108.4%	106.7%											
CP5028					101.7%	101.7%	90.6%	98.6%							
DKA 40-16	100.1%	99.2%	100.0%	99.8%					97.1%	99.5%	100.9%	98.8%			
DKA40-51RR					99.8%	100.7%	103.3%	101.2%							
DKA 44-18	99.9%	99.0%	94.6%	97.7%	103.7%	101.8%	104.9%	103.3%	101.7%	104.8%	103.8%	103.3%	100.5%	100.5%	103.3%
DKA 50-17	103.5%	104.3%	102.4%	103.4%					105.7%	104.0%	102.0%	104.2%			
DG 4120									98.8%	100.1%	102.8%	100.3%			
Dyna-Gro Exp. #1	102.8%	98.6%	104.0%	101.9%											
F2F6C-418					109.0%	100.9%	104.2%	104.5%							
F2F6C-628					99.2%	98.5%	90.9%	96.6%							
FG C0415SN223*									98.5%	98.2%	104.0%	99.8%			
Finch	99.4%	104.7%	105.1%	103.1%											
FSG 415BR									104.6%	102.2%	100.6%	102.8%			
FSG 527									102.9%	103.1%	109.2%	104.5%			
GO-FU Falcata Alfalfa									72.7%	78.4%	69.1%	73.7%			
HybriForce - 3600									104.6%	97.3%	93.2%	99.3%			
HybriForce - 4400									100.4%	100.9%	96.7%	99.6%			
Integra 8460									98.8%	105.0%	104.7%	102.3%			
Integra 8520									100.4%	100.5%	101.8%	100.8%			
LS - 04SJ									101.1%	95.8%	96.8%	98.3%			
LS - 06DR									98.4%	99.0%	98.8%	98.7%			

Table 2. Continued. 2023 Summary of Conventionally Sprayed Alfalfa Yield Trials Planted Since Fall of 2018 - Near Pasco, WA

Entry	Seeded August 2018				Seeded August 2019				Seeded August 2020				6 YR Avg. of	6 YR Avg. of	6 YR Avg. of
	2019	2020	2021	3 Yr.	2020	2021	2022	3 Yr.	2021	2022	2023	3 Yr.	2018 & 2019 Trials	2018 & 2020 Trials	2019 & 2020 Trials
LS - 1508									105.2%	102.9%	102.6%	103.8%			
MPIII Max Q					98.5%	95.6%	98.2%	97.3%							
MVS 4220Q									109.0%	109.4%	116.7%	111.1%			
Quail	99.2%	96.5%	96.0%	97.2%											
Robin	99.3%	99.1%	96.0%	98.1%											
SGS47M					106.7%	105.1%	108.7%	106.7%							
Silverland GT 5									97.8%	93.1%	85.2%	93.0%			
Sureshot	102.0%	104.3%	102.7%	103.0%											
SW 4412Y									99.4%	100.5%	108.9%	102.2%			
SW 5210					104.6%	101.5%	116.2%	106.7%							
SW 5207	100.2%	100.9%	101.2%	100.8%											
SW 5213	102.9%	107.6%	110.8%	107.2%	99.9%	101.1%	104.6%	101.7%					104.5%		
SW 5520Y									102.9%	97.0%	103.3%	101.0%			
Vernal	82.2%	73.9%	78.4%	78.2%	99.2%	98.5%	90.9%	96.6%	89.1%	89.6%	79.1%	86.8%	87.4%	82.5%	91.7%
WL 349HQ	106.7%	106.8%	103.2%	105.5%	96.4%	105.7%	102.3%	101.7%					103.6%		
Avg. Total Tons/Acre	10.10	10.20	11.06	31.37	11.10	13.20	9.57	33.80	12.30	9.87	7.42	29.60			
LSD Years (0.10)**	4.9%	5.9%	6.6%	4.8%	5.8%	4.4%	5.5%	3.9%	6.9%	8.0%	7.5%	5.1%			
CV(%)	4.0%	4.9%	5.6%	4.1%	4.8%	3.7%	4.6%	3.2%	5.8%	6.8%	6.4%	4.3%			

* Was originally submitted as an experimental

** If LSD number is given then it was significant at PR>F 0.10, if not then it was not significant (NS).

Table 3. 2023 Summary of Roundup™ Sprayed Alfalfa Yield Trials Planted Since 2018 - Near Pasco, WA

Entry	Seeded August 2018				Seeded August 2019				Seeded August 2020				6 YR Avg. of	6 YR Avg. of	6 YR Avg. of
	2019	2020	2021	3 Yr.	2020	2021	2022	3 Yr.	2021	2022	2023	3 Yr.	2018 & 2019 Trials	2018 & 2020 Trials	2019 & 2020 Trials
54VR70					103.4%	99.1%	107.8%	103.0%							
6527R.ST									100.5%	102.2%	103.4%	101.8%			
Allied Seed 438RR	100.9%	103.3%	106.9%	103.8%											
AmeriS. 416NT RR*									102.6%	103.3%	98.0%	101.5%			
AmeriS. 481 HVXRR					91.0%	92.9%	96.7%	93.4%							
DG 417RR	101.4%	101.0%	97.9%	100.0%											
DKA 40-21HVXRR	98.7%	98.3%	94.9%	97.2%	99.0%	94.3%	94.5%	95.9%					96.6%		
DKA 40-51									100.5%	102.7%	102.6%	101.8%			
DKA43-18RR	99.9%	102.7%	101.9%	101.5%	108.9%	108.4%	106.1%	107.9%	105.6%	101.8%	106.4%	104.7%	104.7%	103.1%	106.3%
DKA44-16RR	102.0%	98.6%	99.2%	99.9%	105.1%	101.1%	104.2%	103.3%	101.2%	97.5%	98.3%	99.3%	101.6%	99.6%	101.3%
DKA50-20RR					104.0%	101.1%	100.0%	101.7%							
Integra 8471R									100.9%	100.2%	98.2%	99.9%			
NG6424R					101.3%	97.7%	99.2%	99.3%							
NG6547R					105.5%	101.1%	103.5%	103.2%							
RR Check	97.1%	96.1%	99.2%	97.6%	100.2%	98.5%	97.8%	98.8%	100.2%	99.0%	95.5%	98.5%	98.2%	98.1%	98.7%
WL375HVX.RR									92.4%	93.8%	95.7%	93.7%			
Total Tons/Acre	10.20	10.00	11.37	31.50	11.20	13.53	10.07	34.80	13.20	9.60	8.84	31.61			
LSD (0.10)**	NS	3.7%	NS	2.9%	6.1%	5.0%	NS	5.5%	0.5%	NS	NS	NS			
CV(%)	3.0%	3.0%	7.2%	2.3%	5.1%	4.2%	6.9%	4.5%	3.3%	6.5%	7.3%	4.5%			

* Was originally submitted as an experimental

** If LSD number is given then it was significant at PR>F 0.10, if not then it was not significant (NS).

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

Variety	Marketing	FD	WS	BW	VW	FW	AN	PRR	APH ¹	APH ²	SAA	PA	BAA	SN	SRKN	NRKN	Salt	Tech.
54Q16	Pioneer	4		HR	HR	HR	HR	HR	HR	HR		R		HR				C
54Q29	Pioneer	4		HR	HR	R	HR	HR	HR		R	HR		HR				C
54VQ52	Pioneer	3		HR	HR	HR	HR	HR	HR	HR	R	R		HR				C
54VR70	Pioneer	4		R	R	R	R	HR	HR	R		MR		HR				R
6453Q	NEXGROW	4	2	HR	HR	HR	HR	HR	HR	HR	R	R		R			G	C
6585Q	NEXGROW	5	2	HR	HR	HR	HR	HR	HR			R		HR			G	C
Ace	BrettYoung	4		HR	HR	HR	HR	HR	HR		R	MR	R	HR				C
AFX 429*	Alforex Seeds	4	2	HR	HR	HR	HR	HR	HR	R			R	R				C
AFX 439*	Alforex Seeds	4		HR	HR	HR	HR	HR	HR	R	HR	R	R	R				C
AFX 457*	Alforex Seeds	4		HR	HR	HR	HR	HR	HR		R	HR		R			G	C
AFX 469*	Alforex Seeds	4	1	HR	HR	HR	HR	HR	HR	MR				HR			G	C
AFX 579*	Alforex Seeds	5	2	HR	HR	HR	HR	HR	HR	R			R	HR			G	C
AmeriS 416NT RR	America's Alf.	4		HR	HR	HR	HR	HR	HR		R	R		HR			G	R
AmeriS 427TQ	America's Alf.	4	1	HR	HR	HR	HR	HR	HR	HR		R		HR			G	C
AmeriS 428TQ	America's Alf.	4	1	HR	HR	HR	HR	HR	HR	HR	R	R		HR			G	C
AmeriS 445NT	America's Alf.	4		HR	R	HR	HR	HR	R		HR	R		HR		HR		C
AmeriS 446NT	America's Alfalfa	4	2	HR	HR	HR	HR	HR	R		R	HR					G	C
AmeriS 481 HVXRR	America's Alfalfa	4	2	HR	HR	HR	HR	HR	HR	HR	R	R		R			G	RX
AmeriS 518NT	America's Alfalfa	5		HR	HR	HR	HR	HR	HR			HR		HR		HR	G	C
DG 4120	Nutrien Ag Solutions	4	1	HR	HR	HR	HR	HR	HR	HR	R	R		R			G	C
DG 4210	Nutrien Ag Solutions	4	1	HR	HR	HR	HR	HR	HR		HR	R		R				C
DKA40-16	DeKalb	4	1	HR	HR	HR	HR	HR	HR	R	R	R		HR			G	C
DKA40-21HVXRR	Dekalb	4	2	HR	HR	HR	HR	HR	HR	R	R	R		R				RX
DKA40-51RR	Dekalb	4	1	HR	HR	HR	HR	HR	HR	HR	R			R				R
DKA43-18RR	DeKalb	4	2	HR	HR	HR	HR	HR	HR	HR				HR		R		R
DKA44-16RR	DeKalb	4	2	HR	HR	HR	HR	HR	HR	R	R	R		R			G	R
DKA50-17	DeKalb	5	1	HR	HR	HR	HR	HR	HR	R		HR		R				C
FSG 450	Allied Seed	4	2	HR	HR	HR	HR	HR	HR	R	R	HR		R				C
Gunner AA	Winfield United	5	1	HR	HR	HR	HR	HR	HR	HR		HR		HR			G	C
Hi-Gest 360	Alforex Seeds	3		HR	HR	HR	HR	HR	HR	HR			R				G	C
HVX MegaTron	CROPLAN	4	2	HR	HR	HR	HR	HR	HR	HR	R	R		R			G	RX
HybriForce-4420/Wet	Alforex Seeds	4		HR	HR	HR	HR	HR	HR	HR								H
ISS37Q	Simplot	3	1	HR	HR	HR	HR	HR	HR	HR		R		R			G	C
LegenDairy AA	CROPLAN	3	1	HR	HR	HR	HR	HR	HR	HR	R	HR		R			G	C

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

Variety	Marketing	FD	WS	BW	VW	FW	AN	PRR	APH ¹	APH ²	SAA	PA	BAA	SN	SRKN	NRKN	Salt	Tech.
Magnum 8	Dairyland Seeds	4		HR	HR	HR	HR	HR	HR	R	R	MR	R	R				C
Magnum 8-Wet	Dairyland Seeds	4	2	HR	HR	HR	HR	HR	HR	HR	R	MR	R	MR				C
MPIII Max Q	Simplot Seeds	5	2	HR	HR	HR	HR	HR	HR	R	R	HR		HR			G	C
Nimbus	CROPLAN	5		HR	R	HR	HR	HR	HR			HR		HR		HR	F	C
PGI 529	Alforex Seeds	5	1	HR	R	HR	HR	HR	HR		MR	R	MR	R				C
Rebound AA	CROPLAN	4	2	HR	HR	HR	HR	HR	HR	HR	R	R		R			G	C
RR AphaTron 2XT	CROPLAN	4	1	HR	HR	HR	HR	HR	HR	HR		HR		H			G	C
RR NemaStar	CROPLAN	5		HR	HR	HR	HR	HR	HR		R	R		HR		R	G	R
RR Saltiva	CROPLAN	5	2	HR	HR	HR	HR	HR	HR		R	HR	MR	HR			G	R
SGS 47M	Simplot	4	2	HR	HR	HR	HR	HR	HR	R		R		R				C
SW 5210	Alfalfa Partners	5		HR	HR	HR	HR	HR	HR	HR	R	HR		HR			G	C
SW 5213	Alfalfa Partners	5		HR	HR	HR	HR	HR	HR	HR	R	HR		HR				C
Vernal	Public	2		R	S	MR	S	S	S					SN		MR		C
WL 3441.RR	W-L Alfalfas	4	2	HR	HR	HR	HR	HR	HR	HR		R		HR			G	R
WL 349HQ	W-L Alfalfas	4	2	HR	HR	HR	HR	HR	HR	HR		HR		R			G	C
WL 3521	W-L Alfalfas	5	2	HR	HR	HR	HR	HR	HR	HR	HR	HR		R			G	C
WL375HVX.RR	W-L Alfalfas	5	2	HR	HR	HR	HR	HR	HR	HR		R		HR			G	RX
WL 377HQ	W-L Alfalfas	5		HR	HR	HR	HR	HR	HR		HR	HR		HR		HR	G	C

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
 APH² Aphanomyces Race 2

SRKN Southern Root Knot Nematode
 NRKN Northern Root Knot Nematode
 Salt Tol.- G=germination F=forage prod.
 Tech. C= Conv., R= RR, RX= RR & HarvXtra H=Hybrid

* NAFA's "Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties - 2024 Edition and previous editions". "For a more complete copy of the NAFA 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 - 2020 Conventional Alfalfa Variety Trial, Othello, Adams County, WA
Forage Yield (Ton DM/A)**

Planted August 6, 2020		Fall	2021		2022		2023 Harvests						3 Year Total		2023 Fall	
		Dorm.	Total	Total	Total	Total	26-May	26-Jun	23-Jul	23-Aug	18-Sep	Total	Total	Total	Total	13-Oct
Company	Entry	Rating	Tons/a	% Mean	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	Stand
America's Alfalfa	AmeriStand 428TQ	4	11.89	105.7	11.55	111.4	2.76	1.55	1.68	1.39	0.63	8.02	112.2	31.46	109.6	88.6
High Quality Check	High Quality Check	3	12.16	108.1	11.33	109.2	2.80	1.48	1.53	1.40	0.52	7.72	108.1	31.21	108.8	86.5
W-L Research	WL 377HQ	5	11.71	104.1	11.23	108.2	2.77	1.47	1.66	1.31	0.65	7.86	110.1	30.80	107.3	85.8
S&W Seed Co.	SW5520Y	5	11.74	104.4	11.16	107.6	2.58	1.58	1.59	1.42	0.67	7.84	109.7	30.74	107.2	92.6
S&W Seed Co.	SW4306	4	11.92	105.9	11.22	108.2	2.57	1.58	1.44	1.27	0.50	7.35	102.9	30.49	106.3	88.8
Nutrien Ag Solutions	DG 4120	4	11.36	101.0	11.06	106.6	2.49	1.68	1.77	1.41	0.66	8.01	112.1	30.43	106.0	89.5
Legacy Seeds, LLC	LS - 06DR	4	11.49	102.1	10.84	104.5	2.54	1.55	1.57	1.28	0.53	7.46	104.5	29.79	103.8	84.5
Forage Genetics	FG C0415SN223*	NA	11.07	98.4	10.43	100.6	2.38	1.77	1.82	1.41	0.87	8.24	115.4	29.75	103.7	87.7
Bayer US Crop Science	DKA50-17	5	11.01	97.9	10.88	104.9	2.58	1.60	1.64	1.29	0.64	7.75	108.5	29.64	103.3	84.9
Legacy Seeds, LLC	LS - 1508	6	11.45	101.8	10.57	101.9	2.59	1.53	1.51	1.28	0.60	7.51	105.1	29.53	102.9	85.4
NEXGROW	6453Q	4	11.35	100.9	10.22	98.6	2.67	1.54	1.59	1.37	0.65	7.81	109.3	29.38	102.4	87.1
Legacy Seeds, LLC	LS - 04SJ	4	11.79	104.8	10.51	101.3	2.50	1.41	1.49	1.24	0.41	7.04	98.6	29.34	102.2	83.6
Pioneer Brand	54Q29	4	11.00	97.8	10.92	105.3	2.62	1.48	1.48	1.17	0.57	7.32	102.5	29.24	101.9	87.6
S&W Seed Co.	SW4412Y	4	11.57	102.8	10.56	101.8	2.62	1.24	1.44	1.23	0.50	7.02	98.3	29.15	101.6	91.7
RR check	RR check	4	11.31	100.6	10.17	98.0	2.41	1.41	1.43	1.17	0.48	6.90	96.6	28.39	98.9	88.1
BrettYoung	Silverland GT 5	5	10.49	93.2	9.44	91.0	1.68	1.06	1.44	1.20	0.53	5.92	82.9	25.85	90.1	75.4
Public	Vernal	2	9.48	84.2	8.53	82.3	1.99	0.96	1.20	0.88	0.32	5.34	74.7	23.35	81.4	69.2
GO Seed/Jerry Hall	GO-FU Falcata Alfalfa	NA	8.34	74.2	6.09	58.7	1.47	0.37	0.95	0.58	0.12	3.48	48.7	17.92	62.4	32.5
Mean		4.2	11.25	100	10.37	100.0	2.45	1.40	1.51	1.24	0.55	7.14	100.0	28.69	100.0	86.0
CV %			5.7	5.7	7.0	7.0	10.4	10.6	9.0	9.6	21.0	7.7	7.7	5.6	5.6	7.6
LSD 10%			0.76	6.8	0.86	8.3	0.30	0.18	0.16	0.14	0.14	0.65	9.1	1.90	6.6	7.4

* Entered as an experimental
NA – not available

Table 6. Three-Year Forage Yield - 2020 Conventional Alfalfa Variety Trial, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)

Planted August 7, 2020		2021		2022		2023 Harvests							3 Yr. Totals		2023 Fall	
		Dorm.	Total	Total	Total	Total	23-May	21-Jun	19-Jul	24-Aug	22-Sep	Total	Total	Total	Total	13-Oct
Company	Entry	Rating	Tons/a	% Mean	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	% Stand
Alforex Seeds	X-Force 5400*	4	13.63	111.2	11.41	115.5	2.30	2.08	2.28	1.60	0.12	8.26	111.3	33.3	112.7	89.9
Mountain View Seeds	MVS 4220Q	4	13.35	109.0	10.80	109.4	2.10	2.22	2.43	1.91	0.08	8.66	116.7	32.8	111.1	95.7
Pioneer Brand	54Q29	4	13.19	107.6	10.27	104.0	1.97	2.00	2.04	1.56	0.12	7.56	101.9	31.0	105.0	87.9
Allied Seed	FSG 527	5	12.61	102.9	10.18	103.1	2.20	2.02	2.21	1.67	0.11	8.10	109.2	30.9	104.5	88.0
Bayer US Crop Sci.	DKA50-17	5	12.96	105.7	10.27	104.0	1.99	1.95	2.12	1.51	0.20	7.57	102.0	30.8	104.2	82.9
Legacy Seeds, LLC	LS - 1508	6	12.89	105.2	10.16	102.9	2.02	1.91	2.20	1.49	0.14	7.61	102.6	30.7	103.8	84.9
Bayer US Crop Sci.	DKA44-18	4.4	12.46	101.7	10.35	104.8	2.18	1.93	2.19	1.40	0.19	7.70	103.8	30.5	103.3	90.5
Alforex Seeds	AFX 439*	4	12.45	101.6	10.33	104.6	1.85	2.02	2.20	1.53	0.32	7.61	102.5	30.4	102.8	92.9
Allied Seed	FSG 415BR	4	12.82	104.6	10.09	102.2	2.12	1.85	1.99	1.51	0.08	7.47	100.6	30.4	102.8	88.0
Wilbur Ellis	Integra 8460	4	12.11	98.8	10.37	105.0	2.14	1.98	2.16	1.49	0.05	7.77	104.7	30.2	102.3	92.1
S&W Seed Co.	SW4412Y	4	12.19	99.4	9.92	100.5	2.23	2.05	2.29	1.51	0.09	8.08	108.9	30.2	102.2	95.0
High Quality check	High Quality check	3	12.55	102.4	9.75	98.7	2.37	1.82	2.10	1.42	0.23	7.72	104.0	30.0	101.6	86.2
S&W Seed Co.	SW5520Y	5	12.61	102.9	9.58	97.0	1.91	2.00	2.20	1.55	0.31	7.66	103.3	29.8	101.0	90.4
Wilbur Ellis	Integra 8520	5	12.31	100.4	9.93	100.5	2.21	1.88	2.06	1.41	0.14	7.55	101.8	29.8	100.8	93.2
Nutrien Ag Sol.	DG 4120	4	12.12	98.8	9.89	100.1	1.85	1.99	2.27	1.52	0.12	7.63	102.8	29.6	100.3	91.0
Forage Genetics	FG C0415SN223*	NA	12.07	98.5	9.70	98.2	1.97	1.98	2.21	1.56	0.13	7.72	104.0	29.5	99.8	87.6
Alforex Seeds	HybriForce-4400	4	12.30	100.4	9.96	100.9	2.08	1.79	1.96	1.35	0.21	7.18	96.7	29.4	99.6	87.9
Alforex Seeds	HybriForce-3600	4	12.81	104.6	9.61	97.3	1.85	1.76	1.93	1.38	0.20	6.92	93.2	29.3	99.3	83.9
America's Alfalfa	AmeriStand 428TQ	4	11.98	97.8	9.63	97.5	1.93	1.97	2.22	1.57	0.13	7.69	103.7	29.3	99.2	86.9
Bayer US Crop Sci.	DKA40-16	4	11.90	97.1	9.82	99.5	1.86	1.96	2.16	1.50	0.18	7.49	100.9	29.2	98.8	93.2
Legacy Seeds, LLC	LS - 06DR	4	12.06	98.4	9.77	99.0	2.05	1.82	2.07	1.38	0.12	7.33	98.8	29.2	98.7	88.0
Legacy Seeds, LLC	LS - 04SJ	4	12.40	101.1	9.46	95.8	1.84	1.86	2.02	1.46	0.24	7.18	96.8	29.0	98.3	81.4
RR Check	RR Check	4	12.32	100.5	9.74	98.6	1.93	1.81	1.84	1.38	0.08	6.96	93.8	29.0	98.2	82.9
Alforex Seeds	AFX175021	5	11.03	90.0	9.84	99.6	2.09	1.92	2.08	1.52	0.06	7.61	102.6	28.5	96.4	86.4
BrettYoung	Silverland GT 5	5	11.99	97.8	9.19	93.1	1.61	1.44	1.82	1.45	0.07	6.32	85.2	27.5	93.0	78.5
Public	Vernal	2	10.92	89.1	8.85	89.6	1.87	1.40	1.53	1.06	0.14	5.87	79.1	25.6	86.8	64.0
GO Seed/Jerry Hall	GO-FU Falcata Alfalfa	4	8.92	72.7	7.75	78.4	2.00	1.04	1.20	0.89	0.29	5.13	69.1	21.8	73.7	77.2
Mean		4.2	12.3	100.0	9.87	100.0	2.02	1.87	2.07	1.47	0.15	7.42	100.0	29.6	100.0	86.9
CV %			5.8	5.8	6.8	6.8	13.1	6.1	8.5	10.9	12.4	6.4	6.4	4.3	4.3	8.8
LSD 10%			0.84	6.9	0.79	8.0	0.31	0.13	0.21	0.19	0.18	0.56	7.5	1.5	5.1	9.0

NA = Not Available

* Entered originally as an experimental.

**Table 7. Three-Year Forage Yield - 2020 Roundup Ready™ Alfalfa Variety Trial, Pasco, Franklin County, WA
Forage Yield (Ton DM/A)**

Planted August 7, 2020		Fall	2021		2022		2023 Harvests						3 Year Total		2023 Fall	
		Dorm.	Total	Total	Total	Total	23-May	21-Jun	19-Jul	24-Aug	24-Sep	Total	Total	Total	Total	13-Oct
Company	Entry	Rating	Tons/a	% Mean	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	Stand %
Bayer US Crop Science	DKA43-18	4.3	13.92	105.6	9.8	101.8	2.32	1.89	2.13	1.73	1.34	9.41	106.4	33.10	104.7	85.0
NEXGROW	6527R.ST	5	13.25	100.5	9.8	102.2	2.31	1.87	2.01	1.60	1.35	9.14	103.4	32.19	101.8	80.5
Bayer US Crop Science	DKA40-51	3.7	13.24	100.5	9.9	102.7	2.32	1.86	1.94	1.60	1.35	9.08	102.6	32.17	101.8	80.2
America's Alfalfa	AmeriS.416NT RR*	NA	13.52	102.6	9.9	103.3	2.06	1.85	1.91	1.59	1.25	8.66	98.0	32.10	101.5	77.9
Wilbur Ellis	Integra 8471R	5	13.29	100.9	9.6	100.2	2.03	1.88	1.99	1.49	1.30	8.68	98.2	31.59	99.9	84.0
Bayer US Crop Science	DKA44-16	4.4	13.34	101.2	9.4	97.5	2.21	1.87	1.86	1.53	1.23	8.70	98.3	31.39	99.3	86.8
RR check 2	RR Check 2	4	12.65	96.0	9.5	99.5	2.30	1.80	2.02	1.56	1.32	9.01	101.9	31.21	98.7	74.9
RR Check 1	RR Check 1	4	13.21	100.2	9.5	99.0	2.12	1.70	1.92	1.52	1.18	8.44	95.5	31.15	98.5	79.3
W-L Research	WL375HVX.RR	5	12.17	92.4	9.0	93.8	2.23	1.69	1.87	1.51	1.16	8.46	95.7	29.63	93.7	76.9

Mean	4.4	13.2	100.0	9.6	100.0	2.21	1.82	1.96	1.57	1.28	8.84	100.0	31.61	100.0	80.6
CV %		3.3	3.3	6.5	6.5	13.4	7.9	7.7	8.6	10.3	7.3	7.3	4.5	4.5	7.2
LSD 10%		0.53	4.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NA = Not available

* = Entered as an experimental variety

**Table 8. Two-Year Forage Yield - 2021 Othello Alfalfa Variety Trial, Othello, Adams County, WA
Forage Yield (Ton DM/A)**

Planted August 10, 2021		Fall	2022 Harvests		2023 Harvests						2022 & 2023 Total		2023 Fall	
		Dorm.	Total	Total	29-May	26-Jun	23-Jul	23-Aug	18-Sep	Total	Total	Total	Total	13-Oct
Company	Entry	Rating	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	Regrowth
Dyna Gro	DG4120	4	10.28	103.7	2.53	1.65	1.65	1.47	0.77	8.06	112.2	18.3	107.3	4.5
America's Alfalfa	AmeriS. 416NT RR	4	10.49	105.9	2.26	1.58	1.56	1.31	0.60	7.31	101.7	17.8	104.1	4.3
S&W Seed Company	SW5615	5	10.78	108.8	2.46	1.36	1.36	1.27	0.50	6.95	96.7	17.7	103.7	3.5
America's Alfalfa	AmeriStand 428 TQ	4	9.80	98.9	2.45	1.61	1.58	1.52	0.70	7.86	109.3	17.7	103.3	4.0
CROPLAN	Rebound AA	4	10.05	101.4	2.24	1.59	1.52	1.32	0.50	7.17	99.8	17.2	100.8	3.5
CROPLAN	LegenDairy AA	3	9.65	97.4	2.41	1.45	1.43	1.34	0.78	7.41	103.1	17.1	99.8	4.0
RR Check	RR Check	4	9.67	97.6	2.41	1.34	1.38	1.25	0.48	6.85	95.3	16.5	96.6	3.3
America's Alfalfa	Ameristand 446 NT	4	9.32	94.0	2.05	1.45	1.65	1.33	0.69	7.17	99.8	16.5	96.5	5.0
Check Conv.	Vernal	2	9.14	92.3	2.10	1.07	1.21	1.09	0.42	5.89	82.0	15.0	87.9	2.3
Mean		3.9	9.91	100.0	2.32	1.45	1.48	1.32	0.61	7.19	100.0	17.1	7.2	3.8
CV %			5.4	5.4	8.0	8.5	7.2	9.4	21.6	6.8	6.8	5.1	5.1	17.2
LSD 10%			0.65	6.6	0.23	0.15	0.13	0.15	0.16	0.59	8.2	1.0	6.1	0.8

NA = Not available

* = Entered as an experimental variety

**Table 9. Two-Year Forage Yield - 2021 City of Pasco Alfalfa Variety Trial, Pasco, WA
Forage Yield (Ton DM/A)**

Planted August 11, 2022		Fall	2022 Harvests		2023 Harvests						2 Year Total		2023 Fall	
		Dorm.	Total	Total	23-May	21-Jun	19-Jul	24-Aug	22-Sep	Total	Total	Total	Total	13-Oct
Company	Entry	Rating	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	Regrowth
S&W Seed Company	SW5615	5	10.01	113.3	3.49	2.18	2.65	1.89	1.70	11.91	109.4	21.9	111.13	3.5
Corteva Agriscience	54Q16	4	9.49	107.3	3.05	2.15	2.65	1.89	1.66	11.41	104.8	20.9	105.91	3.3
Winfield United	Nimbus	5	9.23	104.4	3.58	1.90	2.63	1.68	1.56	11.34	104.2	20.6	104.28	4.8
Corteva Agriscience	54VQ52	4	9.46	107.0	3.28	2.13	2.30	1.68	1.44	10.82	99.4	20.3	102.80	3.0
Dyna Gro	DG4120	4	8.75	99.0	3.56	1.91	2.54	1.82	1.62	11.45	105.2	20.2	102.40	5.0
Corteva Agriscience	Magnum 8-Wet	4	9.73	110.0	2.95	2.02	2.40	1.66	1.41	10.43	95.8	20.2	102.18	4.0
WL Research	WL 3521	5	8.86	100.2	2.88	2.28	2.62	1.67	1.66	11.11	102.0	20.0	101.20	5.0
America's Alfalfa	AmeriStand 428 TQ	4	9.00	101.9	2.76	2.15	2.66	1.72	1.57	10.87	99.8	19.9	100.73	5.0
RR Check 3	RR Check 3	4	8.60	97.3	3.46	2.01	2.45	1.60	1.50	11.03	101.3	19.6	99.52	3.5
Conv. Check 2	Conv. Check 2	4	8.77	99.2	3.23	2.11	2.32	1.66	1.45	10.78	99.0	19.5	99.07	3.0
Winfield United	Rebound AA	4.4	8.98	101.6	2.64	2.03	2.57	1.69	1.56	10.48	96.2	19.5	98.65	5.0
Corteva Agriscience	HybriForce-4420/Wet	4	9.10	102.9	2.95	1.94	2.37	1.54	1.46	10.26	94.2	19.4	98.12	3.3
Winfield United	LegenDairy AA	3.4	8.27	93.5	3.05	2.09	2.53	1.61	1.60	10.88	99.9	19.1	97.04	4.5
America's Alfalfa	Ameristand 446 NT	4	8.31	94.0	3.14	1.97	2.46	1.50	1.58	10.65	97.8	19.0	96.10	5.0
Legacy Seeds	151*	4	8.73	98.7	2.89	2.01	2.40	1.48	1.40	10.18	93.5	18.9	95.84	3.5
Legacy Seeds	181*	4	8.15	92.2	3.19	1.98	2.45	1.64	1.48	10.74	98.6	18.9	95.72	4.5
Legacy Seeds	183*	4	8.19	92.7	2.82	2.02	2.50	1.65	1.50	10.50	96.4	18.7	94.73	3.8
Public Variety	Check 1 Vernal	2	8.14	92.1	2.98	1.67	1.97	1.42	1.28	9.33	85.6	17.5	88.54	2.3

Mean	3.9	8.8	100.0	3.13	2.02	2.50	1.68	1.56	10.89	100.0	19.7	100.0	4.1
CV %		6.9	6.9	19.0	7.4	6.2	7.6	6.5	6.2	6.2	5.1	5.1	11.4
LSD 10%		0.72	8.1	NS	0.18	0.18	0.15	0.12	0.80	7.3	1.2	6.0	0.5

NA = Not available

* = Entered as an experimental variety

Table 10. Two-Year Forage Yield - 2021 RR City of Pasco Alfalfa Variety Trial, Pasco, WA
Forage Yield (Ton DM/A)

Planted August 11, 2021		Fall	2022		2023 Harvests							2022-2023		2023 Fall
		Dorm.	Total	Total	19-May	21-Jun	19-Jul	24-Aug	22-Sep	Total	Total	Total	Total	13-Oct
Company	Entry	Rating	Tons/a	% Mean	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Tons/a	% Mean	Regrowth
Corteva Agriscience	AFX 463RR	4	9.96	104.1	3.64	2.33	2.54	1.82	1.67	12.00	109.40	21.96	106.94	3.8
CROPLAN	RR Saltiva	4.8	10.36	108.4	2.87	2.16	2.66	1.68	1.61	10.99	100.18	21.36	103.99	4.8
WL Research	WL 3441.RR	5	9.57	100.0	3.24	2.20	2.55	1.69	1.46	11.15	101.59	20.71	100.87	4.8
America's Alfalfa	AmeriStand 416NT RR	4	9.44	98.7	3.05	2.13	2.59	1.63	1.52	10.90	99.39	20.34	99.06	5.0
CROPLAN	HVX Megatron	4.2	9.24	96.6	3.30	2.10	2.57	1.58	1.56	11.10	101.17	20.34	99.03	4.3
CROPLAN	RR NemaStar	4.9	9.42	98.5	3.00	2.11	2.46	1.66	1.50	10.73	97.77	20.15	98.11	5.0
RR Check 1	RR Check 1	4	9.66	101.0	2.82	2.02	2.46	1.57	1.50	10.37	94.51	20.03	97.55	4.0
CROPLAN	RR Apatron 2XT	4	9.43	98.7	2.78	2.13	2.49	1.63	1.54	10.57	96.32	20.00	97.40	4.3
RR Check 2	RR Check 2	4	8.99	94.0	3.32	2.09	2.44	1.57	1.52	10.94	99.67	19.93	97.04	4.5
Mean		4.3	9.6	100.0	3.11	2.14	2.53	1.65	1.54	10.97	100.0	20.5	100.0	4.5
CV %			7.1	7.1	12.0	6.2	6.4	9.3	6.9	5.1	5.1	5.1	5.1	9.5
LSD 10%			NS	NS	0.45	NS	NS	NS	NS	0.68	5.7	NS	NS	0.5

NA = Not available

* = Entered as an experimental variety

Table 11. One-Year Forage Yield - 2022 Othello Alfalfa Variety Trial, Othello, Adams County, WA
Forage Yield (Ton DM/A)

Planted August 9, 2022		Fall	2023 Harvests							2023 Fall
		Dorm. Rating	29-May Cut 1	26-Jun Cut 2	23-Jul Cut 3	23-Aug Cut 4	18-Sep Cut 5	Total Tons/a	Total % Mean	Oct. 13 Regrowth
WL Research	WL 3521	5	1.80	1.89	1.68	1.47	0.77	7.62	110.0	5.0
FGI	CO415RK207*	4	1.73	1.94	1.71	1.43	0.70	7.50	108.3	4.3
Innqvictis Seed Solutions	SGS47M	4	1.86	1.94	1.63	1.34	0.68	7.45	107.7	4.0
FGI	CO418SN215*	4	1.58	1.85	1.70	1.48	0.80	7.42	107.2	5.0
Alforex	AFX479	4	1.48	1.85	1.69	1.50	0.76	7.28	105.2	4.0
FGI	CO416A3360*	4	1.54	1.78	1.72	1.49	0.71	7.25	104.8	4.8
Allied Seed	FSG450	4	1.55	1.87	1.64	1.41	0.74	7.21	104.2	4.5
Winfield United	Gunner AA	5	1.38	1.73	1.69	1.50	0.82	7.12	102.9	4.8
America's Alfalfa	AmeriStand 446NT	4	1.53	1.68	1.66	1.43	0.79	7.09	102.5	5.0
Corteva Agriscience	AFX184021*	4	1.78	1.75	1.60	1.39	0.54	7.05	101.9	3.5
Winfield United	Rebound AA	4	1.36	1.74	1.68	1.50	0.72	7.00	101.1	4.5
WL Research	WL 349HQ	4	1.45	1.59	1.65	1.44	0.72	6.85	99.0	4.5
Winfield United	Saltiva	5	1.29	1.72	1.69	1.42	0.69	6.79	98.1	4.8
Innqvictis Seed Solutions	ISS FD4 EXP> 1 Yr*	4	1.56	1.67	1.61	1.35	0.58	6.77	97.8	4.0
Innqvictis Seed Solutions	MPIII Max Q	5	1.65	1.63	1.59	1.31	0.53	6.70	96.9	4.0
Allied Seed	Signature	4	1.27	1.55	1.70	1.47	0.71	6.70	96.7	4.5
Winfield United	LegenDairy AA	3	1.11	1.67	1.74	1.48	0.69	6.68	96.6	4.3
Nexgrow	6453Q	4	1.57	1.69	1.51	1.27	0.53	6.57	94.9	3.8
Check 2	Check 2	4	1.49	1.61	1.58	1.29	0.51	6.48	93.6	3.5
Simplot	ISS37Q	3	1.41	1.70	1.49	1.27	0.45	6.32	91.3	3.0
Public Variety	Check 1 Vernal	2	1.45	1.37	1.40	1.03	0.25	5.49	79.4	3.0
Mean		4	1.52	1.72	1.64	1.39	0.65	6.92	100.0	4.2
CV %			20.2	10.4	5.9	4.8	13.4	6.1	6.1	9.9
LSD 10%			NS	0.21	0.11	0.08	0.10	0.50	7.2	0.5

NA = Not available

* = Entered as an experimental variety

Table 12. One-Year Forage Yield - 2022 City of Pasco Alfalfa Variety Trial, Pasco, WA
Forage Yield (Ton DM/A)

Planted August 9, 2022		Fall	2023 Harvests							2023 Fall
		Dorm.	18-May	15-Jun	13-Jul	19-Aug	19-Sep	Total	Total	16-Oct
Company	Entry	Rating	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Tons/a	% Mean	Regrowth
Pioneer Brand	54Q16	4	2.35	2.14	2.08	2.18	1.33	10.08	108.9	4.3
WL Research	WL 3521	5	2.12	1.99	2.15	2.37	1.35	9.98	107.9	5.0
FGI	CO416A3360	4	2.00	2.06	2.25	2.38	1.23	9.92	107.2	4.8
America's Alfalfa	AmeriStand 518NT	5	2.15	2.11	2.19	2.29	1.11	9.85	106.4	5.0
Alforex	AFX479	4	2.34	1.98	2.05	2.24	1.15	9.76	105.5	3.3
Alforex	AFX589	5	2.19	1.97	2.07	2.16	1.35	9.74	105.2	4.8
Pioneer Brand	54VR12	4	2.34	2.08	1.94	2.05	1.23	9.63	104.0	3.8
Innactivis Seed Solutions	ISS FD4 EXP > 1 Yr*	4	2.42	1.94	1.92	2.04	1.25	9.56	103.3	4.3
Winfield United	Saltiva	4.8	2.29	1.97	2.00	2.03	1.18	9.47	102.3	4.8
Pioneer Brand	54VQ52	4	2.20	1.99	1.93	2.07	1.27	9.46	102.2	3.5
FGI	CO415RK207	4	2.22	1.87	1.99	2.04	1.18	9.30	100.4	5.0
Innactivis Seed Solutions	MPIII Max Q	5	2.45	1.84	1.83	1.88	1.20	9.20	99.4	3.8
Corteva Agriscience	EXP AFX184021*	4	2.75	1.93	1.78	1.67	1.03	9.16	98.9	2.5
Innactivis Seed Solutions	SGS47M	4	2.02	1.95	2.00	2.00	1.13	9.11	98.4	4.0
Nexgrow	6453Q	4	2.17	1.95	1.87	1.96	1.11	9.07	97.9	4.0
Check 2	Check 2	4	2.13	1.88	1.84	1.95	1.07	8.87	95.8	3.5
FGI	CO418SN215	4	1.98	1.76	1.98	2.07	1.07	8.86	95.7	4.3
America's Alfalfa	AmeriStand 428TQ	4	2.07	1.80	1.81	1.95	1.20	8.83	95.4	4.3
America's Alfalfa	Ameristand 416NT RR	4	2.19	1.85	1.87	1.81	1.10	8.83	95.4	4.5
Simplot	ISS37Q	3	2.27	1.69	1.75	1.74	1.04	8.49	91.8	2.8
Public	Check 1 Vernal	2	1.71	1.54	1.47	1.60	0.90	7.22	78.0	2.0
Mean		4.1	2.21	1.92	1.94	2.02	1.17	9.26	100.0	4.0
CV %			19.1	6.9	8.0	9.8	10.3	6.7	6.7	11.7
LSD 10%			NS	0.16	0.18	0.23	0.14	0.73	7.89	0.6

NA = Not available

* = Entered as an experimental variety

Table 13. Forage Quality Constituents and Hay Value per Ton - First Cutting 2020 Alfalfa Variety Trial, Othello, Adams County, WA

Planted August 6, 2020			Protein Content	Amylase Neutral Deterg. Fiber (aNDF)	Ash Content	Fat Content	Lignin Content	Non-fibrous Carbohydrates (NFC)	Net Energy Lactation NEL (Method NRC 2001)	Neutral Deterg. Fiber Digestab. (NDFD 48.)	Total Value of Hay per Ton @ 12% Moist. ^{1,2,3}
Company	Entry	Rating	%	%	%	%	%	%	Mcal/lb	%	\$/ton
GO Seed	GO-FU Falcata	NA	18.4	39.8	6.66	2.37	6.91	35.6	0.619	40.0	328
Public	Vernal	2	17.4	43.2	6.76	2.11	7.34	33.6	0.588	40.0	326
High Qual. Check	High Qual. Check	3	19.5	39.9	8.56	2.16	6.86	32.7	0.598	38.5	322
Bayer US Crop Sci.	DKA50-17	5	17.9	42.2	8.94	2.06	7.12	31.9	0.570	38.7	314
Pioneer Brand	54Q29	4	17.5	43.9	7.12	2.07	7.63	32.5	0.575	36.8	305

Mean		18.1	41.8	7.61	2.15	7.17	33.3	0.590	38.8	319
CV %		6.9	3.9	10.5	6.4	4.7	3.5	4.2	4.6	5.5
LSD 10%		NS	2.1	1.00	0.17	0.43	1.5	0.031	NS	NS

¹ Calculated at \$0.723/ lb of Metabolizable Protein; \$0.111/lb of Mcal of energy, and \$0.0.178 lb of effective NDF (assuming aNDF is 100% effective). and 0.083, \$0.246, 0.178 lb of effective NDF (assuming aNDF is 100% effective) for 2021, 2022, 2023 respectively.

² Adjustment for fiber impact of milk production due to cows eating more or less ration due to fiber digestibility, \$6.50 increase or decrease of value of hay for every point below or above and NDFD 47%, respectively.

³ Total Value of Hay per Ton @ 12% Moisture (sum of protein, energy, fiber, & fiber adjustment)

NA – not available

Table 14. Forage Quality Estimates RFV, RFQ, Value per Ton of Protein, Energy, Fiber, Adjustment for Cow Intake and Total Value per Ton As Fed From First Cutting of 2020 Alfalfa Variety Trial, Othello, Adams County, WA

Planted August 6, 2020			Relative Feed Value (RFV)	Relative Feed Quality (RFQ)	Value of Metabolizable Protein (@ 55% of C. Protein) per Ton ¹	Value of Energy (MegaCalories) per Ton ¹	Value of NDF Fiber per Ton ¹	Adj. For Feed Intake per Ton ²	Total Value of Hay per Ton @ 12% Moisture ³
Company	Entry	Rating	Units	%	\$/ton	\$/ton	\$/ton	\$/ton	\$/ton
GO Seed	GO-FU Falcata	NA	145	152	129	121	124	-45	328
Public	Vernal	2	129	135	122	115	135	-45	326
High Qual. Check	High Qual. Check	3	144	143	136	116	125	-55	322
Bayer US Crop Sci.	DKA50-17	5	133	132	125	111	132	-54	314
Pioneer Brand	54Q29	4	125	124	122	112	137	-66	305
Mean		3.5	135	137	127	115	131	-53	319
CV %			5.5	7.8	6.9	4.2	3.9	-21.7	5.5
LSD 10%			9	13	NS	6	6	NS	NS

¹ Calculated at \$0.723/ lb of Metabolizable Protein; \$0.111/lb of Mcal of energy, and \$0.0.178 lb of effective NDF (assuming aNDF is 100% effective).

² Adjustment for fiber impact of milk production due to cows eating more or less ration due to fiber digestibility, \$6.50 increase or decrease of value of hay for every point below or above and NDFD 47%, respectively.

³ Total Value of Hay per Ton @ 12% Moisture (sum of protein, energy, fiber, & fiber adjustment)

NA – not available

Table 15. Alfalfa Yield, Value per Ton of Protein, Energy, Fiber, Adjustment for Cow Intake, Total Value per Ton and First Cut per Acre As Fed From of 2020 Trial in 2021 - Alfalfa Variety Trial, Othello, Adams County, WA

Planted August 6, 2020			1st Cut Yield (12% Moisture)	Value of Metabol. Protein (@ 55% of C. Protein) per Acre ¹	Value of Energy (MegaCalories) per Acre ¹	Value of NDF Fiber per Acre ¹	Adjust. For feed intake per Acre ²	First Cut Nutrient Value of Hay (@ 12% Moisture) per Acre ³	Total Value of Hay per Ton @ 12% Moisture ³	First Cut Average 2020-2023 Total Value of Hay per Ton @ 12% Moisture ^{3,4}	First Cut 2020-2023 Total Nutrient Value of Hay (@ 12% Moisture) per Acre ^{3,4}
Company	Entry	Rating	Tons/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/ton	\$/acre	\$/acre
High Qual. Check	High Qual. Check	3	3.18	433	370	396	-175	1024	322	398	5,610
Pioneer Brand	54Q29	4	2.98	366	334	409	-196	913	305	379	4,666
Bayer US Crop Sci.	DKA50-17	5	2.94	367	326	387	-158	923	314	385	4,643
Public	Vernal	2	2.26	276	259	304	-102	738	326	398	4,366
GO Seed	GO-FU Falcata	NA	1.67	215	201	207	-76	546	328	414	4,118

Mean	3.5	2.60	331	298	341	-144	829	319	395	4,681
CV %		7.0	12.3	9.9	5.9	-20.2	10.1	5.5	1.8	6.6
LSD 10%		0.23	51	37	25	36	106	NS	9	392

¹ Calculated at \$0.723/ lb of Metabolizable Protein; \$0.111/lb of Mcal of energy, and \$0.0.178 lb of effective NDF (assuming aNDF is 100% effective).

² Adjustment for fiber impact of milk production due to cows eating more or less ration due to fiber digestibility, \$6.50 increase or decrease of value of hay for every point below or above and NDFD 47%, respectively.

³ Total Value of Hay per Ton @ 12% Moisture (sum of protein, energy, fiber, & fiber adjustment)

⁴ Due to changing markets for nutrients, each year average prices for the year was used including: \$0.33, \$1.07, \$0.72/ lb of Metabolizable Protein; \$0.117, \$0.088, 0.11/lb of Mcal of energy; and 0.083, \$0.246, 0.178 lb of effective NDF (assuming aNDF is 100% effective) for 2021, 2022, 2023 respectively.

NA – not available

Table 16. Forage Quality Constituents and Hay Value per Ton - First Cutting 2020 Alfalfa Variety Trial, Pasco, Franklin County, WA

Planted August 7, 2020			Protein Content	Amylase Neutral Deterg. Fiber (aNDF)	Ash Content	Fat Content	Lignin Content	Non-fibrous Carbohydrates (NFC)	Net Energy Lactation NEL (Method NRC 2001)	Neutral Deterg. Fiber Digestab. (NDFD 48.)	Total Value of Hay per Ton @ 12% Moist. ^{1,2,3}
Company	Entry	Rating	%	%	%	%	%	%	Mcal/lb	%	\$/ton
High Qual. Check	High Qual. Check	3	21.1	39.7	10.55	1.82	6.99	29.6	0.572	43.9	363
GO Seed	GO-FU Falcata	NA	20.9	42.3	9.58	1.82	7.46	28.4	0.565	42.2	357
Public	Vernal	2	19.5	42.9	9.64	1.78	7.55	29.2	0.553	42.7	350
Pioneer Brand	54Q29	4	19.6	42.6	9.05	1.82	7.61	29.9	0.561	40.4	336
Bayer US Crop Sci.	DKA50-17	5	19.6	42.4	9.75	1.87	7.73	29.4	0.553	39.6	329
Mean		3.5	20.1	42.0	9.71	1.82	7.47	29.3	0.561	41.7	347
CV %			6.7	4.6	8.0	6.6	5.0	3.5	3.3	6.0	6.6
LSD 10%			NS	NS	NS	NS	NS	NS	NS	NS	NS

¹ Calculated at \$0.723/ lb of Metabolizable Protein; \$0.111/lb of Mcal of energy, and \$0.0.178 lb of effective NDF (assuming aNDF is 100% effective).

² Adjustment for fiber impact of milk production due to cows eating more or less ration due to fiber digestibility, \$6.50 increase or decrease of value of hay for every point below or above and NDFD 47%, respectively.

NA – not available

Table 17. Forage Quality Estimates RFV, RFQ, Value per Ton of Protein, Energy, Fiber, Adjustment for Cow Intake and Total Value per Ton As Fed From First Cutting of 2020 Alfalfa Variety Trial, Pasco, Franklin County, WA

Planted August 7, 2020			Relative Feed Value (RFV)	Relative Feed Quality (RFQ)	Value of Metabolizable Protein (@ 55% of C. Protein) per Ton ¹	Value of Energy (MegaCalories) per Ton ¹	Value of NDF Fiber per Ton ¹	Adj. For Feed Intake per Ton ²	Total Value of Hay per Ton @ 12% Moisture ³
Company	Entry	Rating	Units	%	\$/ton	\$/ton	\$/ton	\$/ton	\$/ton
High Qual. Check	High Qual. Check	3	17	151	148	111	124	-20	363
GO Seed	GO-FU Falcata	NA	9	137	146	110	132	-31	357
Public	Vernal	2	16	135	136	108	134	-28	350
Pioneer Brand	54Q29	4	13	133	137	109	133	-43	336
Bayer US Crop Sci.	DKA50-17	5	5	130	137	108	132	-48	329
Mean		3.5	133	137	141	109	131	-34	347
CV %			6.9	8.5	6.7	3.3	4.6	-47.7	6.6
LSD 10%			NS	NS	NS	NS	NS	NS	NS

¹ Calculated at \$0.723/ lb of Metabolizable Protein; \$0.111/lb of Mcal of energy, and \$0.0.178 lb of effective NDF (assuming aNDF is 100% effective).

² Adjustment for fiber impact of milk production due to cows eating more or less ration due to fiber digestibility, \$6.50 increase or decrease of value of hay for every point below or above and NDFD 47%, respectively.

³ Total Value of Hay per Ton @ 12% Moisture (sum of protein, energy, fiber, & fiber adjustment)

NA – not available

Table 18. Alfalfa Yield, Value per Ton of Protein, Energy, Fiber, Adjustment for Cow Intake, Total Value per Ton and First Cut per Acre As Fed From of 2020 Trial in 2022 - Alfalfa Variety Trial, Pasco, Franklin, WA

Planted August 7, 2020			1st Cut Yield (12% Moisture)	Value of Metabol. Protein (@ 55% of C. Protein) per Acre ¹	Value of Energy (MegaCalories) per Acre ¹	Value of NDF Fiber per Acre ¹	Adjust. For feed intake per Acre ²	First Cut Nutrient Value of Hay (@ 12% Moisture) per Acre ³	Total Value of Hay per Ton @ 12% Moisture ³	2021-2023 Total Value of Hay per Ton @ 12% Moisture ^{3,4}	2021-2023 Avg. Nutrient Value of Hay (@ 12% Moisture) per Acre ^{3,4}
Company	Entry	Rating	Tons/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/acre	\$/ton	\$/ton	\$/acre
High Qual. Check	High Qual. Check	3	2.70	399	300	335	-54	980	363	414	4,102
GO Seed	GO-FU Falcata	NA	2.27	334	251	300	-70	815	357	431	4,048
Bayer US Crop Sci.	DKA50-17	5	2.26	311	244	299	-108	746	329	398	3,974
Pioneer Brand	54Q29	4	2.24	304	244	299	-98	748	336	394	3,945
Public	Vernal	2	2.13	290	229	285	-59	745	350	407	3,678
Mean		3.5	2.32	328	254	304	-78	807	347	409	3949
CV %			11.7	12.3	11.3	14.2	-51.6	13.8	6.6	2.8	7.6
LSD 10%			0.34	51	36	NS	NS	140	NS	15	NS

¹ Calculated at \$0.723/ lb of Metabolizable Protein; \$0.111/lb of Mcal of energy, and \$0.0.178 lb of effective NDF (assuming aNDF is 100% effective).

² Adjustment for fiber impact of milk production due to cows eating more or less ration due to fiber digestibility, \$6.50 increase or decrease of value of hay for every point below or above and NDFD 47%, respectively.

³ Total Value of Hay per Ton @ 12% Moisture (sum of protein, energy, fiber, & fiber adjustment)

⁴ Due to changing markets for nutrients, each year average prices for the year was used including: \$0.33, \$1.07, \$0.72/ lb of Metabolizable Protein; \$0.117, \$0.088, 0.11/lb of Mcal of energy; and 0.083, \$0.246, 0.178 lb of effective NDF (assuming aNDF is 100% effective) for 2021, 2022, 2023 respectively.

NA – not available