

2024 Grass Forage Variety Trial Report

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Research and Extension Center System

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This report summarizes hay forage yields and agronomic characteristics for public and private grass varieties test at IREC during 2020 to 2024. The variety trial was organized and conducted by Charlie Brummer and Grace Woodmansee as a larger effort to evaluate perennial grass performance for hay and grazing across Northeast California. All varieties were drill seeded on September 10th, 2020 using the following pure live seeding rates per acre: Orchard Grass -15 lbs; Tall fescue and Meadow fescue - 20lbs; Timothy and Reed Canarygrass - 5 lbs; Tall Wheatgrass - 10 lbs;, and Meadow Bromegrass - 8 lbs.

Site Information and Grass Management: The study was conducted at IREC. Soil type was a Tulebasin mucky silty clay loam with 4.5% organic matter. Grasses were grown under solid set sprinkler irrigation. Irrigation was scheduled using crop ET estimates and soil moisture monitoring. Irrigation totals are summarized in Table 1. Grasses were fertilized with nitrogen, phosphorus, and potassium with the goal of maximizing yield potential. Fertilizer amounts were determined using soil tests and crop uptake estimates. Fertilizer totals are summarized in Table 2. Nitrogen was low after each grass cutting according to soil tests, thus nitrogen was split applied through the season with a nitrogen application in the form of UAN 32 or urea at 1st irrigation after each cutting. Weeds were controlled with herbicides and hand-weeding to prevent weed competition. Rodents were controlled with bait or trapping. Insects were not a problem. All orchardgrass and timothy varieties showed mild symptoms of foliar fungal diseases on lower leaves during summer months, but symptoms did not warrant a fungicide application.



Table 1: Irrigation Totals¹

Season Total of Applied Water & Rainfall 4/1 to 9/30				
Tall Fescue Timothy Orchard Grass				
acre inches				
Fall	2020	15.06	15.06	15.06
Full Year	2021	37.52	25.89	37.62
	2022	32.54	30.02	32.54
	2023	26.71	26.71	26.71
	2024	34.93	34.93	34.93

¹ Establishment year 2020

Table 2: Fertilizer Totals¹

Season Total of Applied Nutrients lbs/acre				
Total N P ₂ O ₅ K ₂ O				
Year	2020	22	100	100
	2021	271	100	150
	2022	321	100	150
	2023	296	100	180
	2024	300	200	200

¹ Establishment year 2020, fertilizer split applied after each cutting

Table 3: Total 3-Cut Season Yield for Orchardgrass

Variety	2021	2022	2023	2024	2021-24 average	Average heading date (2021-24)
	ton/acre					
Devour	10.5 abc	7.5 a	7.9 a	6.1 ab	8.0 a	10-Jun
Quickdraw HSG	12.0 a	6.8 a	6.6 ab	6.1 ab	7.8 ab	9-Jun
Alpine II	11.1 ab	6.5 a	7.5 ab	6.2 ab	7.8 ab	11-Jun
Tekapo	10.6 abc	6.8 a	7.0 ab	6.3 a	7.7 abc	10-Jun
Barlegrow	11.1 ab	7.2 a	6.8 ab	5.6 abc	7.7 abc	12-Jun
Rushmore II	11.1 ab	7.0 a	6.3 ab	5.8 abc	7.5 abc	9-Jun
Crown Royale	10.9 abc	6.4 a	6.9 ab	5.9 abc	7.5 abc	8-Jun
Persist	10.9 abc	7.1 a	6.1 ab	5.7 abc	7.5 abc	8-Jun
Echelon	10.7 abc	6.8 a	6.5 ab	5.7 abc	7.4 abc	11-Jun
Potomac	11.2 ab	6.8 a	6.2 ab	5.5 abc	7.4 abc	11-Jun
Endurance	11.3 ab	6.9 a	6.0 ab	5.4 abc	7.4 abc	8-Jun
Latar	11.0 abc	6.8 a	6.3 ab	5.5 abc	7.4 abc	9-Jun
Pennlate	10.7 abc	6.8 a	6.3 ab	5.8 abc	7.4 abc	9-Jun
Icon	11.1 ab	6.6 a	6.5 ab	5.1 abc	7.3 abc	7-Jun
Paiute	10.7 abc	6.8 a	6.3 ab	5.4 abc	7.3 abc	7-Jun
Baridana	11.1 ab	6.5 a	6.3 ab	5.2 abc	7.3 abc	8-Jun
HLR Blend	10.4 abc	6.5 a	6.7 ab	5.5 abc	7.3 abc	12-Jun
Bighorn	10.7 abc	6.1 a	7.0 ab	5.5 abc	7.3 abc	10-Jun
Mammoth	11.1 ab	6.4 a	6.5 ab	5.0 abc	7.3 abc	8-Jun
Intensiv	10.5 abc	6.7 a	6.5 ab	5.0 abc	7.2 abc	12-Jun
Profit	11.1 ab	6.2 a	6.4 ab	5.0 abc	7.1 abc	8-Jun
Harvestar	10.5 abc	6.4 a	6.7 ab	4.8 abc	7.1 abc	9-Jun
Niva	10.7 abc	6.3 a	6.3 ab	5.0 abc	7.1 abc	9-Jun
Hallmark	10.9 abc	6.2 a	6.3 ab	4.6 bc	7.0 bc	8-Jun
Extend	11.2 ab	6.1 a	6.1 ab	4.6 bc	7.0 bc	8-Jun
Baraula	10.0 bc	6.0 a	6.3 ab	5.4 abc	6.9 bc	13-Jun
Husar	10.7 abc	6.3 a	5.9 b	4.4 c	6.8 c	12-Jun
Amba	9.4 c	6.4 a	6.7 ab	4.6 bc	6.8 c	7-Jun
Average	10.8	6.6	6.5	5.4	7.3	9-Jun

Table 4: Orchardgrass Plant Stand in Fall of Establishment Year and Spring after 1st Cutting

Variety	2020	2021	2022	2023	2024	2020-2024
	% stand					% stand change
Barlegrow	96 a	95 a	81 ab	70 a	71 a	-25 a
Paiute	96 a	96 a	84 ab	69 a	71 a	-25 a
Extend	96 a	98 a	86 ab	74 a	70 a	-26 a
Husar	95 a	91 a	84 ab	75 a	68 a	-28 a
Icon	98 a	100 a	84 ab	75 a	70 a	-28 a
Intensiv	98 a	99 a	84 ab	76 a	70 a	-28 a
Profit	94 a	96 a	81 ab	73 a	66 a	-28 a
Quickdraw HSG	98 a	100 a	88 a	75 a	70 a	-28 a
Alpine II	99 a	99 a	84 ab	74 a	70 a	-29 a
Bighorn	99 a	99 a	85 ab	73 a	70 a	-29 a
Crown Royale	99 a	100 a	84 ab	78 a	70 a	-29 a
Harvestar	99 a	100 a	81 ab	70 a	70 a	-29 a
Rushmore II	99 a	100 a	86 ab	78 a	70 a	-29 a
Tekapo	99 a	98 a	83 ab	75 a	70 a	-29 a
Amba	96 a	98 a	81 ab	71 a	66 a	-30 a
Baridana	96 a	98 a	83 ab	70 a	66 a	-30 a
Devour	100 a	94 a	76 ab	70 a	70 a	-30 a
Endurance	98 a	98 a	83 ab	71 a	68 a	-30 a
Mammoth	99 a	99 a	83 ab	74 a	69 a	-30 a
Niva	100 a	96 a	84 ab	73 a	70 a	-30 a
Pennlate	100 a	100 a	86 ab	78 a	70 a	-30 a
Potomac	100 a	99 a	88 a	73 a	70 a	-30 a
HLR Blend	99 a	93 a	75 b	70 a	68 a	-31 a
Latar	100 a	99 a	86 ab	73 a	69 a	-31 a
Persist	99 a	98 a	81 ab	70 a	68 a	-31 a
Baraula	100 a	98 a	80 ab	71 a	68 a	-33 a
Hallmark	100 a	98 a	86 ab	76 a	66 a	-34 a
Echelon	100 a	99 a	81 ab	70 a	63 a	-38 a
Average	98	98	83	73	69	-29

Table 5: Total 2-Cut Season Yield for Timothy Varieties

Entry Name	2021	2022	2023	2024	2021-24 average	Average heading date (2021-24)
	ton/acre					
Barfleo	9.5 ab	7.0 a	6.2 a	6.6 a	7.3 a	14-Jun
Zenyatta	9.5 ab	7.3 a	6.0 a	5.9 ab	7.2 ab	14-Jun
KY-Early	10.8 a	5.8 ab	6.1 a	5.5 ab	7.1 ab	9-Jun
Conquest	10.0 ab	5.6 ab	6.2 a	6.3 ab	7.0 ab	6-Jun
Aurora	8.7 bc	7.0 a	6.6 a	5.3 ab	6.9 ab	11-Jun
Basho	8.8 bc	6.4 ab	7.1 a	5.2 ab	6.9 ab	13-Jun
Claire	9.6 ab	6.9 a	5.5 a	5.2 ab	6.8 ab	10-Jun
Lischka	9.3 ab	6.7 a	5.2 a	5.6 ab	6.7 abc	15-Jun
Tuuka	6.8 d	6.8 a	6.8 a	5.9 ab	6.6 abc	16-Jun
Barpenta	6.7 d	6.0 ab	7.5 a	5.5 ab	6.4 abc	16-Jun
Presto	7.1 cd	6.1 ab	6.5 a	5.6 ab	6.3 abc	15-Jun
Baronaise	6.2 d	5.3 ab	6.5 a	5.3 ab	5.8 bc	17-Jun
Climax	6.7 d	4.3 b	6.2 a	4.1 b	5.3 c	16-Jun
Average	8.4	6.3	6.3	5.5	6.6	13-Jun

Table 6: Timothy Plant Stand in Fall of Establishment Year and Spring after 1st Cutting

Entry Name	2020	2021	2022	2023	2024	2020-2024
	% stand					% stand change
Claire	54 b	70 ab	75 a	78 a	65 ab	11 a
Conquest	76 a	78 ab	76 a	73 a	73 a	-4 ab
Zenyatta	73 ab	70 ab	75 a	80 a	68 ab	-5 ab
Aurora	75 a	69 ab	75 a	78 a	68 ab	-8 ab
Tuuka	84 a	75 ab	75 a	76 a	70 ab	-14 b
Barfleo	85 a	79 ab	78 a	78 a	70 ab	-15 b
KY-Early	89 a	83 a	80 a	76 a	73 a	-16 b
Lischka	86 a	68 ab	70 a	79 a	69 ab	-18 b
Barpenta	84 a	63 b	70 a	74 a	65 ab	-19 b
Basho	89 a	73 ab	70 a	76 a	70 ab	-19 b
Baronaise	89 a	80 a	76 a	73 a	68 ab	-21 b
Presto	86 a	76 ab	76 a	79 a	64 b	-23 b
Climax	91 a	80 a	76 a	73 a	66 ab	-25 b
Average	82	74	75	76	68	-13

Table 7: Total 3-Cut Season Yield for Tall Fescue Varieties

Entry Name	2021	2022	2023	2024	Avg yr yield	Avg heading date (2021-24)
	ton/acre					
FSG 402TF	14.0 ab	7.7 a	7.6 a	8.3 a	9.4 a	4-Jun
Goliath	13.8 abc	8.5 a	7.5 a	8.0 ab	9.4 a	4-Jun
Teton II	13.8 abc	8.5 a	7.6 a	7.3 abc	9.3 a	4-Jun
Drover	13.5 abc	8.2 a	7.4 a	7.8 abc	9.2 a	5-Jun
NF1100	13.8 abc	8.1 a	7.7 a	7.2 abc	9.2 a	4-Jun
Kora	14.0 abc	8.2 a	7.5 a	6.8 abc	9.1 a	4-Jun
Texoma MaxQ II	13.8 abc	7.9 a	7.7 a	7.0 abc	9.1 a	5-Jun
Tuscany II	14.1 ab	7.7 a	7.3 a	6.9 abc	9.0 a	5-Jun
Cajun II	13.3 abc	8.1 a	7.4 a	7.1 abc	9.0 a	3-Jun
Tower Protek	13.4 abc	7.9 a	7.1 a	7.5 abc	9.0 a	7-Jun
Hymark	14.1 ab	7.3 a	6.9 a	7.0 abc	8.8 a	6-Jun
Lacefield MaxQ II	13.9 abc	7.3 a	7.2 a	6.9 abc	8.8 a	4-Jun
Atlas II	14.0 abc	7.2 a	7.3 a	6.7 abc	8.8 a	5-Jun
Barolex	12.7 abc	7.8 a	7.9 a	6.6 abc	8.8 a	6-Jun
Baroptima Plus E34	12.9 abc	8.0 a	7.4 a	6.8 abc	8.8 a	6-Jun
Martin II Protek	13.2 abc	7.9 a	7.0 a	7.0 abc	8.8 a	4-Jun
Jesup MaxQ	14.3 a	7.4 a	6.7 a	6.5 abc	8.7 a	4-Jun
Barelite	13.2 abc	8.0 a	7.0 a	6.4 bc	8.7 a	7-Jun
Rustler	13.1 abc	7.6 a	6.7 a	6.8 abc	8.6 a	3-Jun
Fawn	13.1 abc	7.5 a	6.8 a	6.7 abc	8.5 a	3-Jun
Atlas	13.2 abc	7.5 a	6.6 a	6.8 abc	8.5 a	5-Jun
Bronson	13.2 abc	7.7 a	7.0 a	6.2 bc	8.5 a	4-Jun
Jesup MaxQ II	13.4 abc	7.4 a	6.6 a	6.5 abc	8.5 a	4-Jun
Bariane	12.0 c	8.1 a	7.0 a	6.3 bc	8.4 a	8-Jun
Lipalma	13.0 abc	7.5 a	6.5 a	6.0 c	8.2 a	4-Jun
Armory	12.1 bc	7.4 a	6.6 a	6.7 abc	8.2 a	5-Jun
Estancia	12.3 abc	7.2 a	6.7 a	6.4 abc	8.2 a	4-Jun
Average	13.4	7.8	7.1	6.9	8.8	4-Jun

Table 8: Tall Fescue Plant Stand in Fall of Establishment Year and Spring after 1st Cutting

Entry	2020	2021	2022	2023	2024	2020-24 % stand change
	% stand					
Bronson	80 b	98 a	86 a	80 a	74 a	-6 a
FSG 402TF	90 ab	99 a	90 a	80 a	75 a	-15 ab
Lipalma	90 ab	99 a	90 a	80 a	75 a	-15 ab
Barelite	94 a	100 a	86 a	80 a	75 a	-19 b
Armory	95 a	95 a	88 a	80 a	75 a	-20 b
Barolex	95 a	94 a	86 a	80 a	75 a	-20 b
Jesup MaxQ	95 a	98 a	90 a	80 a	75 a	-20 b
Bariane	96 a	98 a	88 a	80 a	75 a	-21 b
Goliath	96 a	98 a	89 a	80 a	75 a	-21 b
Jesup MaxQ II	96 a	98 a	90 a	80 a	75 a	-21 b
Lacefield MaxQ II	96 a	100 a	89 a	80 a	75 a	-21 b
Atlas II	98 a	99 a	90 a	80 a	75 a	-23 b
Cajun II	98 a	96 a	90 a	80 a	75 a	-23 b
Drover	98 a	99 a	89 a	80 a	75 a	-23 b
Kora	98 a	99 a	88 a	80 a	75 a	-23 b
Teton II	98 a	100 a	90 a	80 a	75 a	-23 b
Texoma MaxQ II	98 a	99 a	90 a	80 a	75 a	-23 b
Tuscany II	98 a	100 a	88 a	80 a	75 a	-23 b
Estancia	99 a	99 a	90 a	80 a	75 a	-24 b
Atlas	100 a	99 a	91 a	80 a	75 a	-25 b
Baroptima Plus E34	100 a	100 a	89 a	80 a	75 a	-25 b
Fawn	100 a	99 a	89 a	80 a	75 a	-25 b
Hymark	99 a	100 a	90 a	80 a	74 a	-25 b
Martin II Protek	100 a	98 a	90 a	80 a	75 a	-25 b
NF1100	100 a	100 a	89 a	80 a	75 a	-25 b
Rustler	100 a	99 a	90 a	80 a	75 a	-25 b
Tower Protek	100 a	100 a	89 a	80 a	75 a	-25 b
Average	96	98	89	80	75	-22



Table 9: Total Season 3-Cut Yield for Meadow Fescue Varieties

Entry Name	2021	2022	2023	2024	2021-24 Avg yield	Avg heading date (2021-24)
	ton/acre					
Azov	10.9 ab	6.9 a	5.1 a	4.7 a	5.6 c	6-Jun
Liherald	11.6 a	6.4 a	5.1 a	4.4 a	6.5 ab	4-Jun
Preval	11.2 ab	6.1 a	5.1 a	4.3 a	6.9 a	5-Jun
Pradel	10.7 ab	6.4 a	4.8 a	4.3 a	6.7 ab	6-Jun
KF Galaxy	11.0 ab	6.5 a	4.7 a	4.0 a	6.5 ab	6-Jun
Driftless	10.8 ab	6.2 a	4.7 a	4.3 a	6.0 bc	7-Jun
Hidden Valley	10.2 b	5.7 ab	4.7 a	3.3 a	6.5 b	8-Jun
Tetrax	8.2 c	4.7 b	5.3 a	4.2 a	6.9 a	11-Jun
Average	10.6	6.1	4.9	4.2	6.4	6-Jun

Table 10: Meadow Fescue Plant Stand in Fall of Establishment Year and Spring after 1st Cutting

Entry	2020	2021	2022	2023	2024	2020-24 % stand change
	% stand					
Azov	95 ab	98 a	84 a	79 a	75 a	-20 a
Hidden Valley	91 ab	98 a	81 a	76 a	71 ab	-20 a
Tetrax	86 b	61 b	63 b	74 a	64 b	-23 a
Pradel	93 ab	96 a	83 a	80 a	69 ab	-24 a
Preval	100 a	100 a	86 a	80 a	75 a	-25 a
Liherald	96 ab	96 a	83 a	79 a	70 ab	-26 a
KF Galaxy	95 ab	98 a	86 a	74 a	68 ab	-28 a
Driftless	100 a	100 a	89 a	79 a	71 ab	-29 a
Average	95	93	82	78	70	-24

Table 11: Total Season 3-Cut Yield for Othe Grass Species

Grass Species	Entry	2021	2022	2023	2024	2021-24 Avg Yield	Avg heading date (2021-24)
		ton/acre					
Reed Canarygrass	Chiefton	9.9 ab	8.1 a	7.3 a	7.3 a	8.2 a	16-Jun
Reed Canarygrass	Palaton	10.3 ab	7.5 ab	7.0 a	6.9 a	7.9 a	16-Jun
Tall Wheatgrass	Jose	9.0 bc	6.1 bcd	6.3 ab	3.8 b	6.3 b	15-Jun
Meadow Brome	Macbeth	10.5 a	7.0 abc	3.1 d	4.0 b	6.2 b	28-May
Tall Wheatgrass	NF6020 (Plainsman)	9.8 ab	5.4 cd	4.8 bc	4.2 b	6.0 b	18-Jun
Meadow Brome	Cache	8.2 c	7.9 ab	3.6 cd	4.0 b	5.9 b	28-May
Wheatgrass	NF8000	9.4 abc	4.7 d	4.4 cd	4.4 b	5.7 b	18-Jun
	Average	9.6	6.7	5.2	4.9	6.6	11-Jun

Table 12: Other Grass Species Plant Stand in Fall of Establishment Year and Spring after 1st Cutting

Grass Species	Entry	2020	2021	2022	2023	2024	2020-24 % stand change
		% stand					
Reed Canarygrass	Palaton	51 bc	65 bc	75 ab	80 a	75 a	24 a
Meadow Brome	Cache	41 c	54 c	70 ab	76 a	64 ab	23 a
Reed Canarygrass	Chiefton	55 bc	71 abc	79 a	80 a	76 a	21 a
Tall Wheatgrass	Jose	69 ab	90 ab	79 a	78 a	69 ab	0 ab
Wheatgrass	NF8000	74 ab	93 a	81 a	80 a	73 a	-1 ab
Meadow Brome	Macbeth	81 a	89 ab	75 ab	76 a	70 a	-11 b
Tall Wheatgrass	NF6020 (Plainsman)	70 ab	85 ab	59 bc	64 b	55 b	-15 b
	Average	63	78	74	76	69	6

