

IRRIGATED ORCHARDGRASS VARIETY TRIAL

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Abstract

Thirteen orchardgrass varieties were planted at the Central Oregon Agricultural Research Center's Powell Butte site in August of 1987. The trial was completed in 1992. Many of the orchardgrass varieties outyielded 'Latar', the check variety. The following cultivars were above average in yield: 'Napier', 'Sterling', 'Potomac', 'Comet' and 'Orion' ranked first through fifth, respectively. 'Fawn', the check variety, was among the lowest yielders.

Introduction

Grass hay and pasture are important agricultural crops in central Oregon, either grown as pure stands or in mixtures with alfalfa and clover. A grass variety trial was conducted from 1968 to 1972 at Redmond, Oregon. Species in that trial included, and ranked in order of most productive to least productive, orchardgrass, timothy, bromegrass, meadow foxtail, intermediate wheatgrass, tall fescue and Kentucky bluegrass. This new orchardgrass trial was initiated because many new varieties had been introduced since the last trial.

Materials and Methods

Non-coated, non-treated seed of 13 orchardgrass cultivars (Table 1) was hand broadcast on August 21 and 22, 1987 at the Powell Butte site of the Central Oregon Agricultural Research Center. Eighteen pounds of seed per acre was planted into 6 x 20 ft plots in a randomized complete block design and replicated four times. The seed was raked in and rolled with a corrugated roller.

Soil test values (0-12 in. depth samples were taken June 1, 1987) were 6.5 pH, 13 ppm P, 281 ppm K and 6.2 ppm N-NO₃. A 410 lb/a broadcast application of 16-20-0-15 was incorporated into the seedbed on August 17, 1987 prior to planting. On April 4, 1988, 500 lbs of 16-20-0-15 was topdressed. The fertilizer applications for the remainder of the trial years are listed in Table 2.

These trials were partially supported by testing fees collected from Cenex/Land O'Lakes, Daehnfeltd, Inc., International Seeds, Inc., Northrup King Co., Turf Seed, Inc., and Willamette Seed and Grain.

Table 1. Orchardgrass cultivar names and sources of each cultivar planted in 1987 at Powell Butte.

Cultivar	Source*
Rancho	Cenex/Land O'Lakes
Phyllox	Daehnfeldt, Inc
Ambassador	International Seeds, Inc.
Comet	Northrup King Co.
Orion	Northrup King Co.
Syn 8SM	Turf Seed, Inc.
Syn 885	Turf Seed, Inc.
Syn 887	Turf Seed, Inc.
Napier	Willamette Seed & Grain
Paute	USDA
Latar	
Potomac	
Sterling	

* Source or originating agency

Gooding Seed Co. or Round Butte Seed Growers

Table 2. Nitrogen and sulfur fertilizer applied per cutting in the trial in pounds per acre at Powell Butte.

Year	1st Cut	2nd Cut	3rd Cut	4th Cut
	N S	N S	N S	N S
1989	80 - 60	80 - 0		
1990	90 - 60	80 - 0		
1991	100 - 60	90-0	80-0	
1992	110 - 60	100 - 0	100 - 0	100 - 0

Plot size harvested was 3.3 x 14 ft in 1989 and 3.5 x 15 ft in 1990, 1991, and 1992. An approximately one pound forage sample was oven-dried to determine dry matter, and forage yields were converted to tons per acre. The samples were dried at 149°F in 1990, 1991, and 1992. Forage yields are reported in oven dry weight or approximately 0 percent moisture.

Results and Discussion

Results for the 1988 crop year are published in Central Oregon Crop Research 1987-1988, OSU Agricultural Experiment Station Special Report 847, October 1989, "Forage

Grass Variety Trials Preliminary Report". The forage yield data for 1989, 1990, 1991, and 1992 are in Tables 3, 4, 5, and 6.

Over the course of the five year trial, 'Napier', 'Sterling', 'Potomac', 'Comet' and 'Orion' ranked first through fifth, respectively for total yield. 'Orion' was one of the highest yielders the first two years and then yielded slightly less than average the last three years. This variety may have produced more if fertility levels had been higher. Unpublished nitrogen rate trial results from 1992 on grass hay fields indicate that grass will respond up to 150 pounds of N per acre. The forage yields would have been higher as well, but only two harvests were taken annually the first three years. These orchardgrass cultivars performed under a medium N fertility regime in this variety trial. The varieties may not have been allowed to express their full potential. 'Napier', 'Sterling', 'Potomac', 'Paiute', 'Comet', 'Ambassador', and 'Rancho' were still producing well in the fifth year. 'Tatar' and 'Orion' had average forage yields in the fifth year.

The highest yielding orchardgrass variety yielded less than the highest yielding tall fescue variety in an adjacent trial. The tall fescue cultivars, (especially when excluding 'Tandem' tall fescue from the mean) on average, slightly outyielded the orchardgrass varieties.

To aid in cultivar selection, the 1988-1992 data are presented also as an annual yield summary (Table 7), cumulative annual yield summary, (Table 8) and percent relative yield to check summary (Table 9).

Table 3. 1989 forage yield results of the orchardgrass varieties in tons per acre at Powell Butte.

Variety	1st Cut	2nd Cut	Total
Rancho	2.37	2.50	4.87
Phyllox	2.08	2.74	4.82
Ambassador	2.46	2.64	5.10
Comet	2.38	2.37	4.75
Orion	2.64	2.54	5.18
Syn 8SM	2.04	2.45	4.49
Syn 885	2.19	2.31	4.50
Syn 887	1.98	2.37	4.35
Napier	2.37	2.38	4.75
Paiute	2.17	2.38	4.55
Latar	2.32	2.39	4.70
Potomac	2.52	2.41	4.93
Sterling	2.53	2.69	5.22

Mean	2.32	2.47	4.79
Harvest Date	6/20	8/29	
PLSD .05	0.35	0.40	0.58
CV %	10.4	11.2	8.5

Table 4. 1990 forage yield results of the orchardgrass varieties in tons per acre Powell Butte.

Variety	1st Cut	2nd Cut	Total
Rancho	1.84	2.05	3.88
Phyllox	1.79	1.91	3.70
Ambassador	2.09	1.81	3.90
Comet	2.11	1.94	4.05
Orion	1.65	2.05	3.70
Syn 8SM	1.61	2.23	3.84
Syn 885	1.53	1.86	3.39
Syn 887	1.75	2.15	3.90
Napier	1.99	2.27	4.26
Paiute	1.76	1.82	3.58
Lazar*	1.80	2.10	3.90
Potomac	1.83	1.96	3.79
Sterling	1.96	2.16	4.12
Mean	1.82	2.03	3.84
Harvest Date	6/27	9/11	
PLSD .10	0.19	NS	NS
PLSD .05	0.23	NS	NS
PLSD .01	0.30	NS	NS
CV %	8.7	15.3	10.3

* Check variety

Table 5. 1991 forage yield results of the orchardgrass varieties in tons per acre at Powell Butte.

Variety	1st Cut	2nd Cut	Cuts 1 & 2	3rd Cut	Total 1, 2 & 3
Rancho	3.16	2.02	5.18	1.03	6.22
Phyllox	2.89	1.95	4.84	0.96	5.80
Ambassador	3.22	2.03	5.25	0.98	6.22
Comet	3.34	2.28	5.63	1.09	6.71
Orion	3.42	2.05	5.47	0.89	6.36
Syn 8SM	3.35	2.12	5.48	0.97	6.45
Syn 885	2.92	1.95	4.87	1.05	5.92
Syn 887	3.44	2.26	5.69	1.05	6.74
Napier	3.55	2.38	5.93	1.11	7.04
Paiute	3.57	1.99	5.56	1.09	6.65
Latar*	3.16	2.29	5.45	1.11	6.56
Potomac	3.56	2.18	5.74	1.15	6.88
Sterling	3.27	2.33	5.60	1.09	6.68
Mean	3.30	2.14	5.44	1.04	6.48
Harvest Date	6/26	8/19		10/18	
PLSD .10	NS	0.20	0.47	NS	0.54
PLSD .05	NS	0.24	0.57	NS	0.65
PLSD .01	NS	0.33	0.76	NS	0.87
CV %	10.8	8.0	7.3	13.2	7.0

* Check variety

Table 6. 1992 forage yield results of the orchardgrass varieties in tons per acre at Powell Butte.

Variety	1st Cut	2nd Cut	Cuts 1 & 2	3rd Cut	Total Cuts 1-3	4th Cut	Total 4 Cuts
Rancho	2.21	1.67	3.88	1.18	5.07	0.86	5.93
Phyllox	1.77	1.25	3.01	1.21	4.22	0.96	5.18
Ambassador	2.17	1.74	3.91	1.14	5.05	0.88	5.93
Comet	2.05	1.85	3.91	1.21	5.12	0.90	6.02
Orion	2.13	1.56	3.69	1.16	4.85	0.79	5.64
Syn 8SM	1.87	1.40	3.27	1.16	4.43	0.86	5.28
Syn 885	1.89	1.35	3.24	1.18	4.42	0.92	5.34
Syn 887	1.81	1.65	3.47	1.21	4.68	0.94	5.62
Napier	2.03	1.97	4.00	1.36	5.35	1.12	6.47
Paiute	1.97	1.88	3.84	1.18	5.03	1.00	6.03
Latar*	1.99	1.57	3.55	1.26	4.81	0.84	5.65
Potomac	2.08	1.64	3.72	1.20	4.92	1.16	6.08
Sterling	2.07	1.85	3.92	1.27	5.19	1.13	6.32
Mean	2.00	1.64	3.65	1.21	4.86	0.95	5.81
Harvest Date	5/28	7/14	NA	8/19	NA	10/19	NA
PLSD .10	NS	0.24	0.39	NS	0.40	0.14	0.43
PLSD .05	NS	0.29	0.47	NS	0.49	0.17	0.51
PLSD .01	NS	0.38	0.63	NS	0.65	0.23	0.69
CV%	13.1	12.2	8.9	8.3	7.0	12.6	6.2

* Check variety

Table 7. 1988-1992 annual forage yield summary of the orchardgrass varieties in tons per acre at Powell Butte.

Variety	19881	19891	19901	19912	19923	Total
Rancho	4.91	4.87	3.83	6.22	5.93	25.76
Phyllox	4.83	4.82	3.88	5.80	5.18	24.51
Ambassador	4.62	5.10	4.23	6.22	5.93	26.10
Comet	4.79	4.75	3.92	6.71	6.02	26.69
Orion	5.50	5.18	3.79	6.36	5.64	26.17
Syn 8SM	5.09	4.49	3.89	6.45	5.28	25.20
Syn 885	4.97	4.50	3.37	5.92	5.34	24.10
Syn 887	4.97	4.35	3.78	6.74	5.62	25.46
Napier	5.45	4.75	3.94	7.04	6.47	27.65
Paiute	4.85	4.55	3.86	6.65	6.03	25.94
Latar*	4.29	4.70	3.85	6.56	5.65	25.05
Potomac	5.31	4.93	3.74	6.88	6.08	26.94
Sterling	5.11	5.22	3.85	6.68	6.32	27.18
Mean	4.98	4.79	3.84	6.48	5.81	26.18
PLSD .10			NS	0.54	0.43	
PLSD .05		0.58	NS	0.65	0.51	
PLSD .01			NS	0.87	0.69	
CV%		8.5	10.3	7.0	6.2	

¹ Two cuttings

² Three cuttings

³ Four cuttings

* Check variety

Table 8. 1988-1992 cumulative annual forage yield summary of the orchardgrass varieties in tons per acre at Powell Butte.

Variety	1988	1989	1990	1991	1992 & Total
Rancho	4.91	9.78	13.61	19.83	25.76
Phyllox	4.83	9.65	13.53	19.33	24.51
Ambassador	4.62	9.72	13.95	20.17	26.10
Comet	4.79	9.54	13.46	20.17	26.69
Orion	5.50	10.68	14.47	20.83	26.17
Syn 8SM	5.09	9.58	13.47	19.92	25.20
Syn 885	4.97	9.47	12.84	18.76	24.10
Syn 887	4.97	9.32	13.10	19.84	25.46
Napier	5.45	10.20	14.14	21.18	27.65
Paiute	4.85	9.40	13.26	19.91	25.94
Latar*	4.29	8.99	12.84	19.40	25.05
Potomac	5.31	9.61	13.35	20.23	26.94
Sterling	5.11	10.33	14.18	20.86	27.18
Mean	4.98	9.77	13.61	19.42	26.18

* Check variety

Table 9. 1988-1992 percent relative forage yield to check summary for the orchardgrass varieties at Powell Butte.

Variety	1988	1989	1990	1991	1992	Five Year Total
Rancho	114	104	99	95	105	103
Phyllox	113	103	101	88	92	98
Ambassador	108	109	110	95	105	104
Comet	112	101	102	102	107	107
Orion	128	110	98	97	100	105
Syn 8SM	119	96	101	98	93	100
Syn 885	116	96	88	90	95	96
Syn 887	116	93	98	103	99	102
Napier	127	101	102	107	115	110
Paiute	113	97	100	101	107	104
Latar*	100	100	100	100	100	100
Potomac	124	105	97	105	108	108
Sterling	119	111	100	102	112	109
Mean	116	102	100	99	103	105

* Check variety