

COMPARATIVE EVALUATION PLANTINGS OF COOL AND WARM SEASON GRASSES

Weston County, Wyoming

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A meeting was held at the Weston County Cooperative Extension Office in the fall of 1998 for the purpose of identifying the cool and warm season grasses producers may utilize in their livestock operations in northeastern Wyoming and western South Dakota. Natural Resource Conservation Service (NRCS) personnel from Montana, South Dakota, and Wyoming and UW personnel collaborated on the planning, planting and harvest of the two trials located at the Doug Materi and Marlin Geier ranches in Weston County.

Materials and Methods

The two ranch sites in Weston County, WY, are dryland sites with an average precipitation of 10 - 14 inches. The soil at the sites is classified as a Recluse loam (fine loamy, mixed, mesic Aridic Argiustolls). This deep, well-drained soil is formed in loamy alluvium from sedimentary rock. Permeability is moderate and water holding capacity is high. A completely randomized block design with four replications was set up to compare and evaluate 31 grass cultivars at the Geier site and 29 grass cultivars at the Materi site. Each plot consisted of four, 20 - foot rows, each spaced 24 inches apart. A clean firm seedbed was prepared at the Geier site by the cooperator and the trial was planted on 12 May, 1999. The trial was planted at the Materi site 21 May and Roundup at one quart/acre was applied 25 May to kill existing vegetation. All cultivars were seeded at the rate of 30 pure live seeds per linear foot of row. Each site received rain the day following planting.

At the Geier site, a fifth replication was added and alfalfa, cicer milkvetch, sainfoin, small burnet and Lewis flax were cross-seeded with cool and warm season grass plots for observational purpose

Cool season grass plots were harvested 5 June 2000, at both sites. Due to the drought conditions, warm season grasses were harvested on 25 July at only the Geier site. Forage yields were determined by hand harvesting one square meter of one of the two center rows. Random samples were taken from each entry; samples were air-dried and percentage moisture determined. Forage yield was corrected for moisture content and reported as pounds per acre on a dry weight basis.

Results and Discussion

At the Geier site in 2000, the first year data was collected following establishment, cool season grass production ranged from 615 lbs/acre for 'Latar' orchardgrass to 1566 lbs/acre 'Fleet' meadow brome grass (Table 1). 'Fleet' and 'Paddock' meadow brome grass had a significantly higher yield than 'Regar' meadow brome grass.

The warm season grasses at the Geier site in 2000 had yields that ranged from 531 lbs/acre for 'Bison' big bluestem to 1417 lbs/acre for 'Sunburst' switchgrass (Table 2). There were no significant differences between varieties of the same species.

For first year data following establishment at the Materi site, cool season grass production ranged from 849 lbs/acre for 'Largo' tall wheatgrass to 1945 lbs/acre for 'Bozoisky-Select russian wildrye (Table 3). 'Hycrest' crested wheatgrass had a significantly higher yield than 'Douglas' crested wheatgrass.

The authors would like to thank the USDA Plant Materials Centers at Aberdeen, ID, Bismarck, ND, Bridger, MT, Manhattan, KS, Los Lomas, NM; Wind River Seed, Manderson, WY; Sharp Bros. Seed Co., Greeley, CO; Oregon /seed Certification Service, Corvallis, OR; Willamette Seed, Albany, OR; Agriculture & Agri-food Canada - Seed Increase Unit, Indian Head, Sask.; and USDA NRCS, Lockeford, CA for donation the seed for the trial.

Table 1. Geier Comparative Cool Season Grass Evaluation Study. Forage production for 19 grass accessions grown under dryland conditions in Weston County, WY.

SPECIES AND CULTIVAR	YIELD LBS/ACRE 2000
Latar orchardgrass	615
Oahe intermediate wheatgrass	1120
Rush intermediate wheatgrass	1042
Reliant intermediate wheatgrass	1547
Greenleaf pubescent wheatgrass	1331
Manska pubescent wheatgrass	958
Greenar pubescent wheatgrass	*
Newhy bluebunch wheatgrass	1232
Fleet meadow brome	1566
Paddock meadow brome	1429
Regar meadow brome	913
Lincoln smooth brome	1402
Manchar smooth brome	1466
Eejay altai wildrye	828
Pearl altai wildrye	847
Prairieland altai wildrye	1213
Magnar basin wildrye	1291
Trailhead basin wildrye	*
Fawn tall fescue	771
Johnstone tall fescue	684
Average	1125
DRS (0.05)	469
CV	29.4

1. DRS (0.05) is the amount of difference required to be statistically significant.
2. CV (coefficient of variability) is a measure of the degree of experimental accuracy.

* It is believed old seed lots of ‘Greenar’ pubescent wheatgrass, ‘Trailhead’ basin wildrye (Table 1), ‘Tomahawk’ indiangrass (Table 2) and ‘San Luis’ slender wheatgrass (Table 3) may have caused the failure of establishment for these four cultivars.

Table 2. Geier Warm Season Grass Evaluation Study. Forage production for 11 grass cultivars grown under dryland conditions in Weston County, WY, 2000.

SPECIES AND CULTIVAR	YIELD LBS/ACRE
Dakotah switchgrass	1018
Forestburg switchgrass	1121
Sunburst switchgrass	1417
Butte sideoats grama	705
Killdeer sideoats grama	779
Pierre sideoats grama	694
Bison big bluestem	531
Bonilla big bluestem	583
Sunnyview big bluestem	628
Goldstrike sand bluestem	552
Tomahawk indiangrass	*
Average	809
DRS (0.05)	391
CV	33.2

1. DRS (0.05) is the amount of difference required to be statistically significant.
2. CV (coefficient of variability) is a measure of the degree of experimental accuracy. A CV of below 15 is desired.

Table 3. Materi Cool Season Comparative Grass Evaluation Study. Forage production for 22 grass accessions grown under dryland conditions in Weston County, WY, 2000.

SPECIES AND CULTIVAR	YIELD LBS/ACRE
Magnar basin wildrye	1151
Trailhead basin wildrye	1195
Bozoisky-Select russian wildrye	1945
Mankota russian wildrye	1678
Douglas crested wheatgrass	1295
Hycrest crested wheatgrass	1672
Nordan crested wheatgrass	1418
Goldar bluebunch wheatgrass	1354
Secar bluebunch wheatgrass	1023
Pryor slender wheatgrass	1481
San Luis slender wheatgrass	*

SPECIES AND CULTIVAR	YIELD LBS/ACRE
P-27 siberian wheatgrass	1675
Vavilov siberian wheatgrass	1348
Bannock thickspike wheatgrass	1283
Critana thickspike wheatgrass	1586
Alkar tall wheatgrass	1184
Jose tall wheatgrass	924
Rodan western wheatgrass	949
Rosana western wheatgrass	901
Average	1311
DSR (0.05)	382.6
CV	19.5

COOL SEASON GRASS NUTRITIONAL ANALYSIS

VARIETY	LOCATION	CRUDE PROTEIN	RELATIVE FEED VALUE
Goldar bluebunch wheatgrass	Materi	12.2	92.8
Newhy bluebunch wheatgrass	Geier	14.6	109.8
Secar bluebunch wheatgrass	Materi	10.9	81.9
Oahe intermediate wheatgrass	Geier	12.2	124.8
Reliant intermediate wheatgrass	Geier	10.9	127.4
Rush intermediate wheatgrass	Geier	13.5	116.0
Greenleaf pubescent wheatgrass	Geier	11.4	104.0
Manska pubescent wheatgrass	Geier	12.8	121.8
P-27 siberian wheatgrass	Materi	13.7	105.1
Vavilov siberian wheatgrass	Materi	13.1	107.9
Jose tall wheatgrass	Materi	13.9	121.6
Largo tall wheatgrass	Materi	14.4	114.5
Bannock thickspike wheatgrass	Materi	11.7	94.5
Critana thickspike wheatgrass	Materi	11.1	89.6
Rodan western wheatgrass	Materi	12.7	113.0
Rosana western wheatgrass	Materi	13.6	125.8
Douglas crested wheatgrass	Materi	14.4	117.3
Hycrest crested wheatgrass	Materi	14.7	102.4
Nordan crested wheatgrass	Materi	12.7	103.0
Pryor slender wheatgrass	Materi	11.6	103.2
Magnar basin wildrye	Geier	18.0	120.4
Magnar basin wildrye	Materi	17.8	111.4
Trailhead basin wildrye	Geier	14.4	106.4
Trailhead basin wildrye	Materi	13.3	107.0
Eejay altai wildrye	Geier	18.1	116.3
Pearl altai wildrye	Geier	18.3	124.9
Prairieland altai wildrye	Geier	18.8	126.0
Bozoisky-Select russian wildrye	Materi	12.1	100.8
Mankota russian wildrye	Materi	11.0	89.6
Sherman big bluegrass	Materi	11.5	85.6
Lodorm green needlegrass	Materi	14.5	101.4
Latar orchardgrass	Geier	14.9	132.5
Fleet meadow brome	Geier	10.5	89.1
Paddock meadow brome	Geier	11.6	89.0
Regar meadow brome	Geier	12.1	95.9
Lincoln smooth brome	Geier	9.8	87.7
Manchar smooth brome	Geier	13.9	101.4
Alta tall fescue	Geier	13.3	112.3
Fawn tall fescue	Geier	15.7	129.8
Johnstone tall fescue	Geier	16.0	138.5

WARM SEASON GRASS NUTRITIONAL ANALYSIS

VARIETY	LOCATION	CRUDE PROTEIN	RELATIVE FEED VALUE
Bison big bluestem	Geier	9.7	114.5
Bonilla big bluestem	Geier	10.8	113.9
Sunnyview big bluestem	Geier	8.5	100.1
Goldstrike sand bluestem	Geier	9.0	98.7
Nezpar indian ricegrass	Materi	14.7	105.9
Butte sideoats grama	Geier	9.6	108.2
Killdeer sideoats grama	Geier	8.9	104.0
Pierre sideoats grama	Geier	7.3	102.1
Dakotah switchgrass	Geier	8.8	106.2
Forestburg switchgrass	Geier	11.5	112.2
Sunburst switchgrass	Geier	9.9	106.1