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Yield and Forage Quality of 27 Cool-Season Grasses at Kimberly, Idaho

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YIELD AND FORAGE QUALITY OF COOL-SEASON GRASSES[1]

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Introduction

The Conservation Reserve Program has stimulated interest in planting cool-season, semi-arid grasses on highly erodible farm and rangeland in the Intermountain West.

Establishment

Twenty-seven accessions of grass were drilled in thirty inch rows with a cone-planter on May 6, 1987 at the USDA-ARS Soil and Water Research Location near Kimberly, Idaho. The nursery was established as a randomized complete block with four replications. Seed was provided by the SCS Plant Materials Center at Aberdeen, Idaho. Forage yields of 27 semi-arid grass accessions grown on a Portneuf silt loam (coarse-silty, mixed, mesic, Durixerollic Calciorthid) with supplemental irrigation are compared in the tables. The grass nursery was fertilized in the spring of 1987 with 40 lbs/acre nitrogen and furrow irrigated prior to planting. The scientific nomenclature follows the genomic system of classification by D. R. Dewey.

First Year

Most varieties had emerged by May 20, 1987. The Sherman and Canbar bluegrasses emerged slowly and most seedlings died before the second irrigation in June of 1987. Weeds were very competitive and reduced the stand of slower growing grasses. The nursery was irrigated again on June 10, 25; July 4, 23; and August 3 and 16, 1987. Forage production was measured by clipping one meter of row from each species in the first and second blocks on September 17, 1987.

Second Year

One meter row lengths were hand-clipped at 5 cm stubble height from blocks 1 and 2 on April 26, 1988. All accessions were in the vegetative stage. The nursery had been irrigated on May 16, 1988 because of the unusual dry conditions. During the period May 27 to 30, 1988 the nursery received 1.2 inches of rain.

The entire row of each replication was mechanically harvested at a **5 inch stubble height** on June 3, 1988. Paiute, Bozoisky, Sherman, and RWR-Syn A were in the bloom stage at this second harvest. The other accessions were just emerging from the boot stage or approaching anthesis. The nursery was irrigated again on June 30 and July 8, 1988--after the second harvest.

Third Year

The nursery was not irrigated but received 12 cm precipitation (90% of normal) from Jan. 1 to June 30, 1989. The entire row of grass was harvested at a 5 inch stubble height with a Hege swather.

[1]Abstract and poster paper presented at Society for Range Management annual meeting, Feb. 13, 1990, Reno, NV.

Table 1. Yield and crude protein of 23 cool-season grasses grown at Kimberly, Idaho.

Cultivar	Common name	Harvest date 9/23/87	6/3/88	6/30/89	6/3/88
			Yield		Crude Protein
		---------- (kg/ha) ----------			--(%)--
Yields of long-lived grasses for subhumid and irrigated sites.					
GREENAR	Intermediate wheatgrass	2980	5850	4590	16
LUNA	Pubescent wheatgrass	3300	6390	4400	13
AMUR	Intermediate wheatgrass	3120	5970	4190	16
Thinopyrum cutum x intermedium		3180	5540	3810	15
TOPAR	Pubescent wheatgrass	2430	5370	3050	12
PAIUTE	Orchardgrass	1690	3210	2970	16
TEGMAR	Intermediate wheatgrass	2720	4550	2720	16
Yields of saline-alkaline tolerant grasses.					
MAGNAR	Basin wildrye	2020	6950	6150	14
ALKAR	Tall wheatgrass	3060	5170	6050	14
JOSE	Tall wheatgrass	2870	4620	4100	15
P-15590	Basin wildrye	1460	4710	3230	13
SODAR	Streambank wheatgrass	1290	3480	1780	11
Yields of drought tolerant long-lived bunchgrasses.					
RWR SYN-A	Russian wildrye	2090	5950	6260	11
BOZOISKY	Russian wildrye	2320	6260	5450	12
T-2950	Bluebunch wheatgrass	960	3840	3970	11
9028606	Crested wheatgrass (A. des.)	1540	4760	3580	14
P-27	Siberian wheatgrass	970	6100	3200	14
SECAR	Bluebunch wheatgrass	850	4600	3190	10
BT NORDAN	Crested wheatgrass	1850	5980	3080	14
HYCREST	Crested wheatgrass	2300	5380	3060	13
EPHRAIM	Crested wheatgrass*	1520	4710	3050	15
FAIRWAY	Crested wheatgrass	2050	5800	2570	14
RS-1	Quackgrass x bluebunch*	2760	5490	2510	14
$LSD_{0.05}$ =		830	1900	2720	

*Rhizomatous

CONCLUSIONS

1.The Russian wildryes (BOZOISKY and RWR SYN-A) had impressive yields under both irrigated and dry conditions. Both grasses produced early growth and maintained green leaves throughout the season.

2.The intermediate wheatgrasses (GREENAR, LUNA, and AMUR) produced well in this deep soil.

3.Basin wildryes were slow in becoming established, but produced very well the second and third years.

4.The fine-leafed grasses (SHERMAN, CANBAR, and COVAR) are more suited for erosion control and recreation areas.

5.HYCREST yielded above the average of the crested wheatgrasses in the second and third year, but BOZOISKY and RWR SYN-A yielded better the second and third year.

6.The Secale montanum variety yielded well the first year but became infected with a mold which almost entirely eliminated the stand.

7.This site has deeper soil, higher fertility, and a longer growing season than many upland range sites or dry farms. Extrapolation of these data to other sites should be done with care.

8.There are several cultivars--some not yet released--available for each type of site and use. Selection of a cultivar or mix should be made based on the management objectives of the site.