Basin Wildrye, Advanced Evaluation 2005
Preliminary Report (June 20, 2005)
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INTRODUCTION

The purpose of this study is to evaluate the "Gund" collection of basin wildrye (*Leymus cinereus*) from Nevada for pre-varietal release potential. Basin wildrye is a perennial cool-season bunchgrass native to many of the cold-desert ecosystems of the Intermountain West and western Great Plains. Basin wildrye is commonly used in seed mixtures for rangeland erosion control, forage and cover seedings, as well as in mine spoil and critical area stabilization projects. Currently there are three industry releases available, 'Magnar', 'Trailhead', and Washoe Germplasm. Magnar and Trailhead were both selected for drought tolerance, while Washoe Germplasm was selected for high tolerance to acidic conditions encountered in mine reclamation situations (Ogle et al, 2002).

MATERIALS AND METHODS

The trial is being conducted at the Aberdeen Plant Materials Center, Fish and Game farm located approximately 5 miles northeast of Aberdeen, Idaho. Experimental design was a randomized complete block with six replications. Individual plots were 20 feet long and contained one row with rows planted on three foot centers. Experimental design also contained plots of all three industry standards for comparison. Soil at the site is a Declo silt loam with pH of 7.4 to 8.4. Average annual precipitation is 8.75 inches. The test site was plowed in the fall of 2004 and subsequently disked and cultipacked in the spring prior to planting.

Plots were seeded on May 19, 2005 using a hand-pushed belt seeder calibrated to drill 30 pure live seeds (PLS) per foot of row. Seed was drilled to an approximate depth of one half inch. Border rows of 'Tegmar' intermediate wheatgrass (*Thinopyrum intermedium* [Host] Barkworth & D. Dewey) were planted on the outside of the blocks to eliminate edge effect. Plots were sprinkler irrigated as needed throughout the growing season. Weeds were controlled with herbicide treatments and between row cultivation.

The first evaluation was conducted on June 15, 2005 (27 days after planting) when most of the plants from both species had reached a one to two leaf stage. Plots were evaluated for percent stand, plant density and seedling vigor. Percent stand was measured using a twenty foot rope marked with one foot increments stretched the length of the plot and anchored at either end. Plants intercepting the one foot increments are summed and recorded as a percentage. Plant density was measured by counting seedlings found in the middle two feet of row and converted to average plants per foot of row. Seedling vigor is measured on an ordinal scale of one to nine (one being most healthy and nine being dead). Entire plots as well as individual plants within plots were viewed and given a rating based on overall apparent vigor.

The second evaluation occurred on September 15, 2005, prior to winter dormancy. Accessions were again evaluated for percent stand using the same method as discussed above. Additionally, it was planned at this point in the trial to evaluate treatments for plant height; however, due to weed pressure and weeds nearing the mature seed stage, the entire field was mowed to a height of approximately four inches. For this reason, individual plants in each plot were selected and measured for average width (in inches) to provide additional plant measurement data.

All data from evaluations were subjected to an Analysis of Variance (ANOVA) and means were separated using Duncan's Multiple Range Test.

RESULTS

At the spring evaluation the highest percent stand was observed in the Trailhead plots (57.9 %) which did not differ significantly from the next highest rating of 52.6 % from Magnar. The lowest stand came from Gund with 13.1 % which was significantly lower than the other three tested accessions. All three industry releases had significantly higher plant density than Gund (7.9, 7.6 and 5.8 plants/foot from Magnar, Trailhead and Washoe respectively versus 0.3 plants/foot from Gund). Gund also showed the poorest seedling vigor with a rating of 7.0 out of 9.0. The three other accessions differed significantly from Gund with vigor ratings from 2.7 to 1.3.

The fall evaluation similarly showed Gund performing significantly more poorly than the other three accessions being tested. Evaluation of percent stand showed the three industry releases rated highest to lowest as Washoe (65.0 %), Magnar (62.2 %) and Trailhead (57.8 %). Gund was rated at 16.7 %. Plant size, as measured in width, was greatest in the three releases. Average widths were 4.3, 4.2, and 4.0 inches for Washoe, Magnar and Trailhead respectively. Gund measured 2.3 inches.

			% stand	Density[1/]	Vigor[2/]	% stand	Width (in)
Accession No.		% PLS[3/]	6/15	6/15	6/15	9/16	9/16
Gund		89.2	13.1 c[4/]	0.3 b	7.0 a	16.7b	2.3b
Magnar		87.5	52.6 ab	7.9 a	1.7 b	62.2a	4.2a
Trailhead		89.6	57.9 a	7.6 a	1.3 b	57.8a	4.0a
Washoe		72.0	40.4 b	5.8 a	2.7 b	65.0a	4.3a
LSD (0.05)			5.4	3.3	1.3	11.9	0.7

[1/] Plants per foot of row
[2/] Rated 1-9 with 1best, 9 worst
[3/] Percent PLS based on estimated 95% purity
[4/] Means followed by the same letter are not significantly different

DISCUSSION

Although it is still early in the evaluation process it appears at this point that the three known industry releases of basin wildrye are significantly better in the four rated categories than the "Gund" collection from Nevada. Future evaluations scheduled for 2006 will compare other characteristics such as plant biomass production and seed production.

REFERENCES

Ogle, D. G., L. St. John, L. Holzworth, S. R. Winslow and T. A. Jones. 2002. Basin Wildrye. NRCS Plant Guide. USDA, NRCS, Idaho State Office & the National Plant Data Center. 6p.