

Coffee Point Off-Center Advanced Test Site
2005 Summary of Progress
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INTRODUCTION

The purpose of the Coffee Point Off-Center Advanced Test Site is to evaluate the potential of grasses for revegetation and forage for livestock and wildlife in areas of 8-12 inch annual precipitation in southeast Idaho. The site is in MLRA 11B, Snake River Plains of the Northwestern Wheat and Range region of the Intermountain United States. This report summarizes the evaluation data collected during the 2005 growing season - the tenth year after the site was planted. Refer to the 1994 - 1999 Summary of Progress Report for details of the evaluations conducted prior to 2005.

The site is located in the Coffee Point Exclosure, approximately 25 miles northwest of Aberdeen on land administered by the USDI - Bureau of Land Management. The exclosure has been used by the Aberdeen Plant Materials Center for testing purposes since 1982.

The soils on the site are a Splittop-Atomic complex with 2 - 8 percent slopes. The Splittop soil is moderately deep and well drained brown loam with moderate permeability, low available water capacity and effective rooting depth of 20 - 40 inches. The Atomic soil is deep and well drained, pale brown silt loam. The effective rooting depth is 60 inches or greater. Permeability and available water capacity is moderate. There are scattered pockets of exposed bedrock. The pH of this soil complex is 7.4 - 8.4. The dominant vegetation in the natural plant community is bluebunch wheatgrass and Wyoming big sagebrush. The site is a Loamy 8 - 12 inch ecological site. The elevation is 4850 feet, the average annual air temperature is 43°F and the frost free period is approximately 90 days.

MATERIALS AND METHODS

The off-center advanced test site is composed of two components, the inter-center strain trial and a display nursery. The inter-center strain trial includes 26 grass accessions which are arranged in a complete randomized block design with 4 replications. The display nursery includes 47 accessions of grasses, forbs, and shrubs to allow landusers and agency personnel to view examples of released cultivars and promising accessions that are adapted to the general area.

The area had been used previously for testing purposes. However, the vegetation was dominated by cheatgrass *Bromus tectorum*, and annual weeds. The site was plowed in late October, 1993. It was planned to cultivate the site during 1994 to control cheatgrass but due to extreme drought conditions, no cheatgrass emerged and cultivation was unnecessary. Russian thistle *Salsola iberica*, halogeton *Halogeton glomeratus*, and kochia *Kochia scoparia* were scattered on the site and were removed with a hay rake prior to firming the seedbed. On October 31, 1994 the site was culti-packed three times. On November 3, 1994 the site was planted except for the winterfat shrub plots in the display nursery which were seeded with a hand pushed belt seeder on April 12, 1995. The reason for delaying planting of the winterfat display plots was to obtain as fresh seed as possible. Table 1 lists the accessions planted and summarizes the evaluation data collected during 2005.

All seed except for the winterfat display plots were mixed with rice hulls prior to seeding to plant approximately 25 seeds per square foot. A double disk drill with press wheels was used. Plots are 6.67 feet wide X 20 feet long. Row spacing was 10 inches with the exception of basin wildrye and Russian wildrye accessions which were planted to 20 inch row spacing. Depth of seeding ranged from 0.25 - 0.75 inches dependent upon species. The winterfat display plots were seeded at a rate of 15 pure live seeds per row foot.

Areas plowed but not seeded with test or display plots were seeded to a cover crop seed mixture composed of the following species and rates:

'P-27' Siberian wheatgrass	1.8 #PLS/ac
'Hycrest' crested wheatgrass	1.3
'Bannock' thickspike wheatgrass	1.1

The middle 2 rows of each plot are sampled for evaluation purposes. Percent stand (or basal cover) data is collected utilizing a 20 foot rope with 1 foot increments stretched and anchored from one end of the plot to the other between the middle 2 rows. Basal cover is measured by the interception of plant parts along the rope at each 1 foot increment which are then summed to give a cover estimate recorded as a percent. Percent stand data was statistically analyzed for Analysis of Variance (ANOVA) and Duncan's Multiple Range Test was completed to show means separation.

Plant density is measured using a row count technique at the mid-point of the plot. Plants are counted from the middle 2 rows for a distance of 18.3 cm for 10 inch row spaced plots and 9.2 cm for 20 inch row spaced plots. The number of plants counted converts directly to the number of plants per square foot. Vigor is a qualitative rating based upon plant health and growth rate. A plant rated 1 would be best and a 9 rating is dead. Data from the replicated plots is averaged while data from the non-replicated display plots is the actual data from that plot.

Production data was collected from plots with 10 inch row spacing and was accomplished by centering a 60 cm X 200 cm frame on the middle 2 rows of each plot, clipping the test material above the plant crown and placing it into individual paper bags. 120 cm X 200 cm frames were used on plots with 20 inch row spacing. The samples were brought back to the PMC and air-dried, weighed and the data was converted to pounds per acre dry weight. Production data was also statistically analyzed for Analysis of Variance (ANOVA). Due to extreme variability in the data, further statistical analysis was not warranted.

Precipitation data for crop years 2000 – 2005 from the University of Idaho Research and Extension Center at Aberdeen is presented below.

Month	Crop year	2000	2001	2002	2003	2004	2005
				(inches)			
October		0.26	1.33	0.28	0.21	0.02	2.93
November		0.04	0.34	0.97	0.71	0.39	0.31
December		0.18	0.26	1.29	0.42	1.36	0.63
January		1.18	0.89	0.56	0.22	0.35	0.96
February		1.02	0.37	0.00	0.63	1.61	0.53
March		0.60	0.26	1.33	0.39	0.68	0.69

April	0.42	0.59	0.34	1.42	0.87	2.10
May	0.96	0.26	0.60	0.54	1.41	2.75
June	0.20	0.04	0.27	0.20	0.26	0.47
July	0.12	0.54	0.50	0.01	0.59	0.14
August	0.06	0.24	0.06	0.59	0.86	0.18
September	0.79	0.67	0.63	0.33	0.63	0.56
Total	5.83	5.79	6.83	5.67	9.03	12.25

2005 EVALUATIONS AND DISCUSSION

The site was first evaluated on June 2, 2005 and data was collected on plant height, percent stand, plant density and vigor. On July 8, plant height, production and vigor data were collected. A summary of this data is presented in Table 1. The extremely wet moisture conditions in the spring had considerable influence on plant performance.

Plant height data collected on June 2 ranged from 12.8 cm for 9019218 bottlebrush squirreltail to 77.3 cm for 'Tetracan' Russian wildrye. On July 14, plant height ranged from 12.8 cm for 9019218 to 96.0 cm for Tetracan. Most growth in height took place prior to the first evaluation.

Percent stand data ranged from 2.0 percent for 'Schwendimar' thickspike wheatgrass to 79.8 percent for Syn A Russian wildrye. Plant density ranged from 0.3 plants per square foot for Schwendimar to 3.3 plants per square foot for 'Sodar' streambank wheatgrass. 'Bozoisky' Russian wildrye had the best vigor rating (1.3) and Schwendimar had the worst vigor rating (7.0) during the June evaluation. In July, 'Hycrest' crested wheatgrass had the best vigor rating (2.0) and 9019218 bottlebrush squirreltail had the worst vigor rating (8.0).

Hycrest crested wheatgrass produced the most (1858 pounds per acre) followed by 'P-27' Siberian wheatgrass (1235 pounds per acre).

Data was also collected from the non-replicated display plots and is also shown on Table 1. 'Parkway' crested wheatgrass had the highest forage production and 'Fairway' crested wheatgrass had the lowest forage production. The only accession remaining in the forb and shrub display plots is Pamirian winterfat.

CONCLUSION

The purpose of the Coffee Point Off-Center Advanced Test Site is to evaluate the potential of grasses for livestock and wildlife in areas of 8-12 inch annual precipitation in southeast Idaho.

After 10 years of establishment, the Russian wildrye accessions (Syn A, Tetracan, Mankota, and Bozoisky) have the best stands. Sodar streambank wheatgrass has the best plant density and the *Agropyron* species (with the exception of 'Douglas') all produced forage greater than 1000 pounds per acre.

The Coffee Point Off-Center Advanced Test Site will be maintained for training purposes and to conduct periodic evaluations to evaluate long-term performance of the accessions planted in November, 1994. A new trial is scheduled to be planted in 2006.

Table 1.
Coffee Point Inter-Center Strain Trial
Summary of 2005 Evaluation data

Accession No.	Common Name	Scientific Name	Replicated Grass Plots						
			Plant Height (cm)		1/ Percent Stand	2/ Plant Density	3/ Vigor		4/ Forage Production
			6/2	7/14	6/2	6/2	6/2	7/14	pounds/acre
Syn A	Russian Wildrye	<i>Psathyrostachys juncea</i>	60.0	79.5	79.8 a	2.0	2.0	2.8	920
Tetracan	Russian Wildrye	<i>Psathyrostachys juncea</i>	77.3	96.0	79.0 a	1.8	1.8	3.8	586
Mankota	Russian Wildrye	<i>Psathyrostachys juncea</i>	62.3	82.5	76.0 a	2.3	1.8	3.0	688
Bozoisky	Russian Wildrye	<i>Psathyrostachys juncea</i>	72.3	83.5	73.5 ab	2.5	1.3	2.3	678
Ephraim	Crested Wheatgrass	<i>Agropyron cristatum</i>	35.5	51.5	61.0 bc	3.0	3.3	3.0	920
P-27	Siberian Wheatgrass	<i>Agropyron fragile sibiricum</i>	47.5	56.3	54.8 c	1.8	3.0	2.5	1235
Sodar	Streambank wheatgrass	<i>Elymus lanceolatus ssp. lanceolatus</i>	41.0	50.3	54.0 c	3.3	2.8	3.8	585
Nordan	Crested Wheatgrass	<i>Agropyron desertorum</i>	44.3	53.8	53.5 c	1.8	2.8	2.5	1059
Hycrest	Crested Wheatgrass	<i>A. cristatum x desertorum</i>	45.8	58.5	52.8 c	2.5	2.8	2.0	1858
Vavilov	Siberian Wheatgrass	<i>Agropyron fragile sibiricum</i>	48.8	57.3	52.0 c	1.3	2.3	2.8	1077
PI-275459	Siberian Wheatgrass	<i>Agropyron sibiricum</i>	48.3	48.3	50.8 c	2.0	3.0	5.5	1133
Douglas	Crested Wheatgrass	<i>Agropyron cristatum</i>	41.3	58.5	45.0 c	2.5	2.3	4.0	743
Bannock	Thickspike Wheatgrass	<i>Elymus lanceolatus ssp. lanceolatus</i>	43.8	69.3	26.5 d	1.8	2.8	2.8	418
Magnar	Basin Wildrye	<i>Leymus cinereus</i>	44.3	66.8	22.8 d	0.8	4.8	4.5	985
Trailhead	Basin Wildrye	<i>Leymus cinereus</i>	43.3	46.5	22.0 d	0.8	5.5	6.5	121
Critana	Thickspike Wheatgrass	<i>Elymus lanceolatus ssp. lanceolatus</i>	45.0	59.8	21.3 de	1.3	4.0	3.8	613
Secar	Snake River Wheatgrass	<i>Pseudoroegneria spicata ssp. spicata</i>	40.8	47.3	18.8 def	0.8	5.5	5.8	307
9019219	Bottlebrush Squirreltail	<i>Elymus elymoides</i>	16.5	17.8	6.5 efg	0.8	6.5	6.8	84
9019218	Bottlebrush Squirreltail	<i>Elymus elymoides</i>	12.8	12.8	6.3 efg	0.3	6.8	8.0	47
SL-hybrid		<i>Elymus x Pseudoroegneria</i>	26.0	26.0	5.8 efg	0.5	6.5	7.8	149
Volga	Mammoth Wildrye	<i>Leymus racemosus</i>	40.8	52.5	5.0 fg	0.5	6.0	6.5	688
Schwendimar	Thickspike Wheatgrass	<i>Elymus lanceolatus ssp. lanceolatus</i>	25.0	25.0	2.0 g	0.3	7.0	7.8	28
9040187	Bottlebrush Squirreltail	<i>Elymus elymoides</i>	0.0	0.0	0.0 g	0.0	9.0	9.0	0
9040189	Bottlebrush Squirreltail	<i>Elymus elymoides</i>	0.0	0.0	0.0 g	0.0	9.0	9.0	0
9040137	Columbia Needlegrass	<i>Stipa nelsonii v. dorei</i>	0.0	0.0	0.0 g	0.0	9.0	9.0	0
9024804	Columbia Needlegrass	<i>Stipa nelsonii v. dorei</i>	0.0	0.0	0.0 g	0.0	9.0	9.0	0

1/ Percent stand is equal to basal cover. Percent stand data was analyzed utilizing Duncan's Multiple Range Test; P=0.05, CV= 29.83; means followed by the same letters are not significantly different.

2/ Plant Density is the number of plants per foot²

3/ Rated 1-9 with 1 best, 9 worst.

4/ 7/13/05 harvest samples were air-dried and weighed.

Table 1 continued.
Coffee Point Inter-Center Strain Trial
Summary of 2005 Evaluation data

Non-replicated Grass Display Plots
1/

Accession No.	Common Name	Scientific Name	Plant		Percent Stand	Plant Density (per ft ²)	<u>2/</u> Vigor		Forage Production pounds/acre
			6/2	7/14			6/2	7/14	
Kirk	Crested wheatgrass	Agropyron cristatum	45	50	55	3	3	3	1935
Parkway	Crested wheatgrass	Agropyron cristatum	49	35	50	3	4	5	2230
Fairway	Crested wheatgrass	Agropyron cristatum	30	40	75	2	4	4	892
Pryor	Slender wheatgrass	Elymus trachycaulis	0	0	0	0	9	9	0
San Luis	Slender wheatgrass	Elymus trachycaulis	61	61	15	0	5	9	0
Newhy	RS Hybrid	Elytrigia x Pseudoroegneria	0	0	0	0	9	9	0
Canbar	Canby bluegrass	Poa secunda	0	0	0	0	9	9	0
Whitmar	Beardless wheatgrass	Pseudoroegneria spicata inermis	71	74	20	1	3	4	855

Non-replicated Forb and Shrub Display Plots

Accession No.	Common Name	Scientific Name	Plant	Number of	Vigor
			Height (cm)	Plants/Sample Rows	6/2
			6/2	6/2	6/2
9021471	Fringed sage	Artemisia frigida	0	0	9
Lutana	Cicer milkvetch	Astragalus cicer	0	0	9
Rincon	Fourwing Saltbush	Atriplex canescens	0	0	9
Wytana	Fourwing Saltbush	Atriplex canescens	0	0	9
9067480	Fourwing Saltbush	Atriplex canescens	0	0	9
Timp	Utah Sweetvetch	Hedysarum boreale	0	0	9
Immigrant	Forage Kochia	Kochia prostrata	0	0	9
Pamirian	Winterfat	Krascheninnikovia ceratoides	36	1	3
9067481	Winterfat	Krascheninnikovia lanata	0	0	9
9063535	Winterfat	Krascheninnikovia lanata	0	0	9
Hatch	Winterfat	Krascheninnikovia lanata	0	0	9
Richfield sel.	Firecracker penstemon	Penstemon eatonii	0	0	9
Clearwater sel.	Alpine penstemon	Penstemon venustus	0	0	9

1/ Percent stand is also equal to basal cover.

2/ Rated 1-9 with 1 best, 9 worst.