

Final Report of Initial Demonstration
and Advanced Conservation Plantings
at the Fairbanks Evaluation Plot
Fairbanks, Alaska, 1985 - 1988

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Introduction

The North Latitude Revegetation and Seed Project at the Alaska Plant Materials Center (PMC), in the Alaska Department of Natural Resources, Division of Agriculture, is responsible for developing new plant varieties (cultivars) for land reclamation, habitat enhancement, and erosion control. In addition to the development of new plant cultivars, this project also is responsible for developing techniques for erosion control and reclamation. In order to accomplish these goals, it is beneficial for the PMC to cooperate with industry, and other governmental agencies throughout Alaska.

Purpose

Advanced Evaluation and Demonstration Plots are established throughout Alaska for three main purposes. The first purpose allows for advanced or final evaluation of plant materials that have performed well at the Palmer PMC for a period of at least three years. This offsite evaluation is important so that a plant's adaptability and range of suitability can be determined. If the plant does well at this stage it may be released as a new cultivar.

The second purpose provides an opportunity to establish demonstration plantings containing the species recommended for the area in The Revegetative Guide for Alaska. The results from the planting determine if changes should be made in "the Guide."

The third reason for the plots is to provide a centralized area for local plantings by the Cooperative Extension agents, District Conservationists (DC), or other cooperators. The agent or DC can tailor the plantings to local interests and at the same time have a "classroom" where specific plant materials may be viewed and worked with by local farmers, students, and other groups interested in farming or gardening.

Interest from the Fairbanks Soil and Water Conservation District, the Soil Conservation Service, USDA, and the Cooperative Extension Service encouraged the Plant Materials Center to establish an evaluation plot. A site was selected at the intersection of the Parks Highway and Chena Ridge Road on public land controlled by the Alaska Department of Transportation. This site fulfilled two important requirements; it was suitable for long-term demonstration plantings, and it was in an area with soils and weather fairly typical of the Barley Project.

Site Preparation

On May 23, 1985, clearing and planting was completed. This work was completed by local farm volunteers and Cooperative Extension Service. The site was prepared by using standard farm equipment donated by the University of Alaska.

Methods

On May 23, 1985, 51 accessions of advance test plant material were planted (Figure 1).

Two plots, were hand-seeded with pre-measured amounts of seed. The seeding rate for each accession was approximately 40 pounds per acre. Following seeding, the plots were fertilized with 20-20-10 fertilizer at a rate of 450 pounds per acre (90 pounds actual nitrogen, 90 pounds actual phosphorus, and 45 pounds actual potash). After the hand seed plots were seeded and fertilized, the areas were raked by hand to incorporate the seed and fertilizer.

In addition to the advanced evaluation blocks, a demonstration planting of varieties recommended in The Revegetative Guide for Alaska was made (Figure 2). Each variety was planted in a 20' x 60' block which was then divided into thirds so that each variety could be grown in three fertilizer regimes. Fertilizer (20-20-10) was applied at the rates of 0 lb/a, 260 lb/a, and 520 lb/a. The demonstration area contained 15 varieties.

Typical Plot Layout

←-----→ 10' ←-----→	
Nugget Kentucky Bluegrass	Merion Kentucky Bluegrass
Park Kentucky Bluegrass	Banff Kentucky Bluegrass
Sydsport Kentucky Bluegrass	Fylking Kentucky Bluegrass
Poa ampla	Troy Kentucky Bluegrass
Sherman Big Bluegrass	Canbar Canby Bluegrass
Tundra Bluegrass	Reubans Canada Bluegrass
Poa glauca T08867	Poa alpina
Agropyron subsecundum 371698	Sodar Streambank Wheatgrass
Nordan Crested Wheatgrass	Agropyron subsecundum Canada
Fairway Crested Wheatgrass	Agropyron violaceum
Summit Crested Wheatgrass	Agropyron boreal
Critana Thickspike Wheatgrass	Agropyron yukonese
Fults Alkaligrass	Vantage Reed Canarygrass
Climax Timothy	Engmo Timothy
Elymus arenarius	Elymus sibiricus 34560
Elymus sibiricus 1966	Elymus sibiricus 2144
Norcoast Bering Hairgrass	Tufted Hairgrass
Sourdough Bluejoint	Calamagrostis canadensis Delta
Meadow Foxtail	Alopecurus geniculatus
Garrison Creeping Foxtail	Arctared Red Fescue
Boreal Red Fescue	Festuca scabrella
Beckmannia	Pennlawn Red Fescue
Durar Hard Fescue	Highlight Red Fescue
Covar Sheep Fescue	Manchar Smooth Brome
Alyeska	Carlton Smooth Brome
Tilesy Sage	

Figure 1. Typical Plot Layout

Demonstration Planting

	0 Fertilizer	260 lb. 20-20-10 per acre	520 lb. 20-20-10 per acre
Arctared			
Boreal			
Durar			
Park			
Merion			
Manchar Smooth Brome			
Polar Brome			
Sourdough Bluejoint			
'Engmo' Timothy			
'Alyeska' Polargrass			
'Garrison' Creeping Foxtail			
Sodar Wheatgrass			
Aurora Alsike Clover			
Alaskaland Red Clover			
White Dutch Clover			

Figure 2.

Advanced evaluation plots are evaluated at least once a year. The accessions are rated for vigor, percent stand, and numerous other factors such as hardiness, disease-resistance, and related characteristics. However, we have found that vigor and percent stand give a reliable indication of how the different accessions compare with each other. Figure 3 is an example of the evaluation sheets that will be presented in this report. The following numbers, followed by brief explanations, correspond to numbers on the example evaluation sheet:

1. Location and title of evaluation plot.
2. Number of evaluation blocks--This number may range from one to three blocks.
3. Year of Record--the year that evaluation data was collected.
4. Vigor--this number can range from one to nine. One is best and nine is the worst rating. If possible, this rating is determined by comparison with other accessions of the same species. The rating is based on color, height, health, flowering and/or seed production, and on the evaluator's knowledge of the plant, and its expected performance. If more than one block is planted, this number will be an average of the ratings for each block.

1	2 # of Blocks	3	4	5																
1	6																			1
2	'Merion' Kentucky Bluegrass																			2
3	'Banff' Kentucky Bluegrass																			3
4	'Park' Kentucky Bluegrass																			4
5	etc.																			5
6																				6
7																				7
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52																				52

Figure 3. Sample Advanced Evaluation Page

5. Percent Stand--this number represents the percentage of the ground that is covered by the accession. Only live plant material is included; litter from previous year's growth and other species are not included. If more than one block is planted, this number will be an average of the ratings for each block.

6. The accession that is being rated. The accession is identified by its varietal and common name or its common name and its accession number.

Results

The first evaluation on August 7, 1985, indicated that the site had been insufficiently prepared. No measurements could be taken because the plots were overrun by weeds. The weed problem occurred even though the site had been fallowed for the year after it had been sprayed with an herbicide. Prior to planting the plot, the site had a severe quackgrass and wild oat problem. In 1986, the plots were mowed free of weeds and evaluation was possible. The performance of the accessions is reported in Figure 4; the numbers are an average of the data from the two plots.

By the final evaluation on August 23, 1988, only 'Nugget' Kentucky Bluegrass, 'Park' Kentucky Bluegrass, 'Gruening' Alpine Bluegrass, 'Arctared' Red Fescue, 'Boreal' Red Fescue, and Tilesy Sage remained. These accessions not only survived the climate and weed competition but performed exceptionally well.

Airbanks Advanced Evaluation Plot		1985		9-16-86		8-13-87		8-23-88		
Two Blocks Planted May 23, 1985		vigor	% stand	vigor	% stand	vigor	% stand	vigor	% stand	
1	'Nugget' Kentucky Bluegrass			1	100	1	100	2	80	1
2	'Merion' Kentucky Bluegrass			1	100	1	100	-	-	2
3	'Banff' Kentucky Bluegrass			2	100	6	75	-	-	3
4	'Park' Kentucky Bluegrass			3	100	4	95	7	55	4
5	'Sydsport' Kentucky Bluegrass			2	100	-	-	-	-	5
6	'Fylking' Kentucky Bluegrass			4	100	3	95	-	-	6
7	'Troy' Kentucky Bluegrass			3	100	5	90	-	-	7
8	Big Bluegrass 387931			1	100	2	90	-	-	8
9	'Sherman' Big Bluegrass			6	40	-	-	-	-	9
10	'Canbar' Canby Bluegrass			-	-	-	-	-	-	10
11	'Reubans' Canada Bluegrass			-	-	-	-	-	-	11
12	'Tundra' glaucus Bluegrass			7	15	-	-	-	-	12
13	Glaucus Bluegrass T08867			1	100	-	-	-	-	13
14	Alpine Bluegrass 235492, 236892			1	95	3	95	2	70	14
15	'Sodar' Streambank wheatgrass			7	30	-	-	-	-	15
16	Bearded wheatgrass 371698			7	50	-	-	-	-	16
17	Bearded wheatgrass 236693			-	-	-	-	-	-	17
18	'Nortran' Crested wheatgrass			-	-	-	-	-	-	18
19	'Fairway' Crested wheatgrass			-	-	-	-	-	-	19
20	'Summit' Crested wheatgrass			-	-	-	-	-	-	20
21	Violet wheatgrass T12050			-	-	-	-	-	-	21
22	Boreal wheatgrass T12048			-	-	-	-	-	-	22
23	Yukon wheatgrass T12051			-	-	-	-	-	-	23
24	'Critana' Thickspike wheatgrass			-	-	-	-	-	-	24
25	'Fults' Alkaligrass			-	-	-	-	-	-	25
26	'Vantage' Reed Canarygrass			7	30	-	-	-	-	26
27	'Engmo' timothy			4	100	-	-	-	-	27
28	'Climax' timothy			7	35	-	-	-	-	28
29	Beach wildrye 345978			-	-	-	-	-	-	29
30	Siberian wildrye 345600			2	90	4	75	-	-	30
31	Siberian wildrye 2144			4	60	-	-	-	-	31
32	Siberian wildrye 1996			-	-	-	-	-	-	32
33	'Norcoast' Bering hairgrass			1	100	-	-	-	-	33
34	Tufted hairgrass 372690			3	75	-	-	-	-	34
35	Bluejoint			3	80	-	-	-	-	35
36	'Sourdough' Bluejoint			2	100	-	-	-	-	36
37	Meadow foxtail			3	100	-	-	-	-	37
38	Geniculated foxtail 314565			-	-	-	-	-	-	38
39	Garrison Creeping foxtail			7	35	-	-	-	-	39
40	'Arctared' Creeping red fescue			1	100	1	100	2	100	40
41	'Boreal' Creeping red fescue			1	100	2	100	1	95	41
42	'Pennlawn' Creeping red fescue			1	100	4	90	-	-	42
43	Rough fescue 236849			2	100	5	50	-	-	43
44	American Sloughgrass T12053			3	50	-	-	-	-	44
45	'Durar' Hard fescue			4	85	-	-	-	-	45
46	'Highlight' Sheep fescue			2	100	7	40	-	-	46
47	'Covar' Sheep fescue			7	50	-	-	-	-	47
48	'Manchar' Smooth Brome			3	100	2	100	-	-	48
49	'Carlton' Smooth Brome			3	100	4	100	-	-	49
50	'Alyeska' Polar grass			6	35	-	-	-	-	50
51	Tilesy Sage T12052			1	100	1	100	1	95	51
52	Pumpelly Brome			1	100	1	100	-	-	52

Figure 4.

In the demonstration planting which contained the varieties recommended in The Revegetative Guide For Alaska, 'Arctared' and 'Boreal' Red Fescue, 'Nugget' Kentucky Bluegrass and Polar Brome out-performed the weeds and exhibited very good growth. The trial would have been more informative if the weed competition had not been so severe.

Conclusions and Recommendations

Because of the severe weed competition, I am reluctant to base any recommendation on these evaluations. A smaller evaluation plot has been established behind the U.S.D.A. Soil Conservation Office in Fairbanks. These results will be available in 1991. A plot was also established at the Chena Flood Control Project. The results are covered in a separate report and may provide suitable recommendations for some areas of Fairbanks.

In 1989, a new evaluation and demonstration plot will be established on property at the Eielsen Agriculture Project.

APPENDIX I

Cooperators:

- ° Soil Conservation Service, USDA
- ° Cooperative Extension Service, U of A
- ° Fairbanks Conservation District

Costs

		DELTA		
Date	Activity	Travel	Per diem	Other
5/23/85	Plant site	50.00	80.00	450.00
8/07/85	Evaluate	0.00	80.00	
9/16/86	Evaluate	0.00	80.00	
8/31/87	Evaluate	0.00	80.00	
8/23/88	Evaluate	<u>0.00</u>	<u>80.00</u>	<u> </u>
		50.00	400.00	450.00
Total	<u>\$900.00</u>			