

84

Notice of the Naming and Release
of
'San Luis' Slender Wheatgrass (Agropyron trachycaulum)

THE
UPPER COLORADO ENVIRONMENTAL PLANT CENTER
AND THE
USDA-SOIL CONSERVATION SERVICE
AND THE
COLORADO STATE UNIVERSITY AGRICULTURAL EXPERIMENT STATIONS
AND THE

announce the naming and release of 'San Luis' slender wheatgrass [Agropyron trachycaulum (Link) Malte.] for commercial production and marketing of seed. This ecotype was selected for rapid establishment of perennial cover on disturbed mountain sites.

Scientific Name: Agropyron trachycaulum (Link) Malte.

Common Name: slender wheatgrass

Cultivar Name: 'San Luis'

Other Identification Numbers: EPC-99, T-37032

Origin: The original seed collection was made by Glenn Niner, August 17, 1975, five miles east along North 10 Mile road near Center, in the San Luis Valley, Rio Grande County, Colorado at 2,280 m (7,500 ft) elevation.

Description and Occurrence: (Agropyron trachycaulum) species is generally described as an erect, tufted perennial bunchgrass ranging in height from 50 to 100 cm. Though the species **is** considered a bunchgrass, very short rhizomes are typical. Native to North America, the species range extends from Alaska to Mexico; Missouri to West Virginia. In Colorado, slender wheatgrass **is** widely distributed over the State, particularly the western three-fourths, at 1,370 m (4,500 ft) to 3,650 m (12,000 ft) elevation.

Slender wheatgrass occurs on moist to dry sites with moderate to highly tolerant alkaline soil conditions (pH 8.8). Various tolerance ranges are quoted in the literature; 11 to 16 mmhos/cm.

A detailed botanical description of the species **is** contained on pages 68-69 in "Manual of the Plants of Colorado" by H.D. Harrington.

'San Luis' has a long seed head and is taller (90 cm) than the average slender wheatgrasses (7.3 cm) in test plots. **It is** comparable to 'Primar' in height.

Slender wheatgrass species are generally relatively short-lived (3-5 years). However, 'San Luis' demonstrates a longer-lived characteristic than most accessions listed. Stands have remained good after 7 years on irrigated and dryland plots at Meeker, Colorado. 'San Luis' was equal to or superior than all other accessions for seedling establishment.

Development: 'San Luis' slender wheatgrass was tested in two initial screening trials at the Environmental Plant Center in Meeker, Colorado: one irrigated and one dryland. **It** was also tested on one off-Center site (Climax) at 3,360 m (11,200 ft) near Leadville, Colorado.

Seed from the initial collection was used to establish a seed increase block in 1981 at the Meeker Center, and off-type plants were removed. This block will be designated as the breeders seed block.

Use: 'San Luis' was selected for outstanding establishment and longevity of stand characteristics. **It** has shown good performance on a wide range of climatic conditions.

Because of its rapid establishment, good emergence success and spreading ability by seed, 'San Luis' is an excellent grass species for erosion control. In seed mixes containing long-lived or slower developing species, 'San Luis' will be prominent initially, but will become secondary as other species become established. Its high biomass production indicates good soil building potential for conservation uses.

Slender wheatgrass **is** considered good quality hay and pasture. Together with other wheatgrasses, it is among the preferred foods of big horn sheep and elk at higher elevations.

'San Luis' **is** recommended for use for soil stabilization on slopes and disturbed sites above 6,000 feet elevation; receiving 35 cm (14 inches) or more average annual precipitation. **It is** recommended for ski slopes, transmission and pipeline corridors, mined land reclamation and road side seedings. **It** may also be used at lower elevation (to approx. 4,500 feet) where rainfall **is** adequate.

Area of Adaptation: Original seed source **is** from 2,280 m (7,500 ft) elevation, high dry mountain park site in southern Colorado. It has shown long-lived adaptation in northwestern Colorado at 2,000 m (6,200 ft) elevation and central Colorado at 3,400 m (11,200 ft) elevation.

Based on these observations and species characteristics, 'San Luis' **is** recommended for use in MLRAs 48, 49, 51, 39, 34B and 47. It also has potential in MLRA 36 (WP-1) at elevation above 2,286 m (7,500 ft).

Seed Characteristics and Production: 'San Luis' appears to be slightly later maturing than 'Primar'. Seed-shatter rated generally light. There were no problems with head smut or powdery mildew at Meeker.

Seed yields from .11-acre plot were equivalent to 373 lbs/acre in 1982. Estimated yield in 1983 are 465 lbs/acre. At Meeker, seed was direct combined harvested August 6, 1982 and August 8, 1983.

Increase and Distribution: .Breeders seed will be maintained by the Upper Colorado Environmental Plant Center, Meeker, Colorado. Foundation seed will be available to seed growers through the Colorado Seed Growers Association. Interested seed growers should contact the Colorado Seed Growers Association, Soil Conservation Service or local soil conservation districts for seed allocations.

Approved By:

Appendix

Summary of Slender Wheatgrass Evaluations and Test Data

Below is information from three trials evaluating the performance of 'San Luis' slender wheatgrass [Agropyron trachycaulum (Link) Malte] with other accessions. 'San Luis' rated equal to or better in stand establishment in all trials and showed good production of forage and seed. It also was long-lived.

Project 7606 Direct Seeding Irrigated Grasses

Introduction: Project 7606 contained 47 accessions of (Agropyron trachycaulum) and included accessions from Canada, Hungary, Germany, USSR, Alaska, New Mexico, Nevada, Oregon, California, Utah, Wyoming and Colorado. This was an initial evaluation project seeded September, 1976. 'Primar' slender wheatgrass was included as a standard.

Methods: Each plot is 20 feet long and row spacing is 36 inches. These plots were sprinkler irrigated and emergence rated the fall of 1976. Evaluations data were recorded on emergence stand, vigor, height production and maturity. Light irrigations were applied 1977 to 1981.

Results: Table 1 contains a summary by years of recorded data on: (1) stand, (2) vigor, and (3) forage production. Emergence was rated in 1976 and only vigor was recorded in 1979, (see Table 1.) Note: Different rating scales were used during the life of the project. In 1979 and beyond, only the better accessions were evaluated.

Project 7604 Direct Seeding Dryland Grasses

Introduction: Project 7604 contains 9 accessions of (Agropyron trachycaulum.) 'Primar' slender wheatgrass was included as a standard and the other accessions originated from collections in Colorado and New Mexico. This project was seeded April 1976.

Methods: The plots were 20 feet long and row spacing was 24 inches. The planting was seeded April 14, 1976. Soil moisture was good. However, the spring was dry and the seeding was spinkler irrigated one time June 4, 1976. Some emergence was noted June 2, 1976. It then snowed 8 inches on June 14, 1976 and temperature dipped to 16° F.

Results: Table 2 contain a summary of evaluation notes recorded in 1976, 1977, 1979, 1980, and 1981. Some adjustments have been made from original notes to show all ratings on the same scale.

Project 7711
Amax Mine Field Evaluation Planting Climax, Colorado

Introduction: Project 7711 was seeded July, 1977 and contains five accessions of slender wheatgrass (Agropyron trachycaulum). These accessions were selected from initial evaluations at Meeker as having good potential for high elevation use. These plots are located at 11,200 feet elevation on a disturbed subsoil site.

Methods: Grass species were planted July 11, 1977 by hand dribbling seed through a Planet Jr. hand seeder in 20 foot rows. Row spacing was 24 inches. The planting was maintained on natural precipitation. Evaluations were made annually on stand, vigor and height.

Results: Table 3 contains a summary of stand and vigor ratings recorded 1977 to 1981.

Table 4 shows a comparative summary of the top performing accessions where they were planted in all three projects. Some adjustments in rating systems have been made to accommodate the different systems used between years and projects.

Table 1 - Summary of *Agropyron trachycaulum* Entries in the 7606 Initial Evaluation Planting
Irrigated Plot Seeded September 1976

Row	Plot	Acc or Var	Origin	1976				1977			1978			1979			1980 4/			1981 4/		
				2/ Emerg.	% Stand	2/ Vigor	2/ Prod	% Stand	3/ Vigor	3/ Prod	3/ Vigor	3/ Stand	3/ Vigor	3/ Prod	3/ Stand	3/ Vigor	3/ Prod	3/ Stand	3/ Vigor	3/ Prod		
36	20	Primar	Montana	2	75	3	4	100	2	2	4	1	4	4	1	4	4					
19		C-25		5	5	-	-	0	-	-	-	-	-	-	1	4	4					
18		San Luis	Colorado	1	90	3	4	100	1	2	4	1	4	4	1	4	4					
17		EPC-119	Colorado	1	90	2	3	100	2	4	4	1	4	4	1	4	5					
16		EPC-139	Colorado	2	90	3	3	100	2	4	4	1	4	4	1	4	5					
15		EPC-173	Colorado	1	90	2	3	100	2	3	4	1	4	4	1	4	4					
14		EPC-259	Colorado	2	85	2	3	100	3	4	4	1	4	4	1	4	4					
13		EPC-282	Colorado	5	40	4	4	90	3	4	4	1	4	4	1	4	5					
12		NM-589	New Mexico	5	0	-	-	90	3	4	-	-	0	-	-	-	-					
11		PI-183009	Canada	2	60	3	4	100	2	3	-	-	0	-	-	-	-					
10		PI-232152	California	5	0	-	-	100	2	3	-	-	0	-	-	-	-					
9		PI-232153	California	3	55	3	4	100	2	3	4	2	4	4	2	4	4					
8		PI-232154	Oregon	3	55	3	4	100	2	3	4	0	-	-	-	-	-					
7		PI-232155	Nevada	5	0	-	-	100	1	3	-	-	0	-	-	-	-					
6		PI-232156	Nevada	3	45	2	3	100	1	-	-	2	4	4	1	4	5					
5		PI-232157	Nevada	2	45	4	4	90	4	4	-	0	-	-	-	-	-					
4		PI-232158	Utah	5	5	3	4	90	2	4	4	0	-	-	-	-	-					
3		PI-232159	Utah	3	4	2	4	50	3	3	-	0	-	-	-	-	-					
2		PI-232160	Utah	5	0	-	-	80	2	3	-	0	-	-	-	-	-					
1		PI-232161	Utah	5	0	-	-	0	-	-	-	0	-	-	-	-	-					
37	1	PI-232162	Utah	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
2		PI-232163	Utah	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
3		PI-232164	Utah	5	3	4	4	10	3	3	-	-	-	-	-	-	-					
4		PI-232165	Colorado	5	5	3	4	20	3	b	-	-	-	-	1	4	4					
5		PI-232167	Colorado	4	25	3	4	30	3	4	-	-	-	-	-	-	-					
6		PI-232168	Colorado	4	0	-	-	0	-	-	-	-	-	-	-	-	-					
7		PI-232169	Colorado	5	10	3	3	80	4	3	4	2	4	4	1	4	4					
8		PI-232170	Colorado	5	10	3	4	30	4	4	-	-	-	-	-	-	-					
9		PI-232171	Wyoming	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
10		PI-232172	Wyoming	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
11		PI-232173	Wyoming	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
12		PI-232174	Wyoming	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
13		PI-232175	Wyoming	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
14		PI-232177	Wyoming	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
15		PI-232178	Wyoming	5	5	3	4	20	4	4	-	-	-	-	1	4	4					
16		PI-232179	Wyoming	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
17		PI-232180	Wyoming	4	20	4	4	60	5	7	-	-	-	-	1	4	4					
18		PI-232181	Montana	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
19		PI-232182	Montana	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
20		PI-232183	Montana	3	55	4	4	90	3	5	-	-	-	-	-	-	-					
21		PI-232184	Montana	3	30	4	4	80	3	3	-	-	-	-	-	-	-					
22		PI-232185	Wyoming	4	35	4	4	11	3	3	-	-	-	-	-	-	-					
38	22	PI-236699	Canada	3	50	3	3	100	2	2	-	1	4	4	1	4	4					
21		PI-236700	Canada	4	40	4	4	100	2	3	-	1	4	4	-	-	-					
20		PI-236701	Canada	5	0	-	-	0	-	-	-	-	-	-	1	4	4					
19		PI-236702	Canada	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
18		PI-236703	Canada	5	15	4	3	60	2	3	4	2	4	4	1	4	5					
17		PI-236704	Canada	5	0	-	-	0	-	-	-	-	-	-	1	4	5					
16		PI-236705	Canada	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
15		PI-236706	Canada	5	0	-	-	0	-	-	-	-	-	-	-	-	-					
14		PI-236707	Canada	3	70	3	3	100	4	4	4	1	4	4	1	4	4					
13		PI-236708	Canada	5	2	4	4	30	3	3	-	1	4	4	1	4	4					
12		PI-236709	Canada	4	65	3	4	100	3	4	4	2	4	4	1	4	4					
11		PI-236710	Canada	3	55	3	4	100	2	3	4	1	4	5	2	4	5					
10		PI-236711	Canada	5	10	4	4	30	3	3	-	-	-	-	-	-	-					
9		PI-236712	Canada	5	5	3	4	30	2	3	-	-	-	-	-	-	-					
8		PI-236713	Canada	5	5	4	4	20	3	3	-	-	-	-	-	-	-					
7		PI-236714	Canada	2	75	4	4	100	3	4	-	-	-	-	-	-	-					
6		PI-236715	Canada	2	55	4	4	90	3	5	-	-	-	-	-	-	-					
5		PI-236716	Canada	5	0	-	-	20	2	2	-	-	-	-	-	-	-					
4		PI-236717	Canada	3	65	3	4	100	3	4	-	-	-	-	-	-	-					
3		PI-236718	Canada	4	40	4	4	90	2	4	-	-	-	-	-	-	-					
2		PI-236719	Canada	5	15	4	4	70	1	3	-	-	-	-	-	-	-					
1		PI-236720	Canada	3	30	4	4	11	4	6	-	-	-	-	-	-	-					

1/ Var. unilaterate
2/ Rating 1=Excellent 5=Very Poor
3/ Rating 1=Excellent 9=Very Poor 0=No Plants
4/ Only the better stands were evaluated.

Row	Plot	Acc or Var	Origin	1976		1977		1978			1979	1980 4/				1981 4/	
				2/ Emerg.	% Stand	2/ Vigor	2/ Prod	% Stand	3/ Vigor	3/ Prod	3/ Vigor	3/ Stand	3/ Vigor	3/ Prod	3/ Stand	3/ Vigor	3/ Prod
39	1	PI-236721	Canada	3	50	4	4	100	5	6	-	-	-	-	-	-	-
	2	PI-236722	Canada	4	55	4	4	80	3	5	-	-	-	-	-	-	-
	3	PI-236723	Canada	4	55	4	4	90	3	5	-	-	-	-	-	-	-
	4	PI-236724	Canada	5	5	4	4	40	4	4	-	-	-	-	-	-	-
	5	PI-236725	Canada	4	65	3	4	100	3	3	-	-	-	-	-	-	-
	6	PI-236726	Canada	5	0	-	-	0	-	-	-	-	-	-	-	-	-
	7	PI-236727	Canada	3	45	4	4	90	5	5	-	-	-	-	-	-	-
	8	PI-232728	Canada	2	55	4	4	90	3	5	-	-	-	-	-	-	-
	9	PI-276711	Hungary	5	0	-	-	0	-	-	-	-	-	-	-	-	-
	10	PI-261864	Germany	4	10	4	4	90	3	3	5	2	4	4	1	4	5
	11	PI-281865	Germany	3	60	3	3	100	3	4	5	1	4	4	1	4	5
	12	PI-315368	USSR	2	70	2	2	100	3	4	-	-	-	-	-	-	-
	13	PI-315494	USSR	2	65	3	3	100	3	3	5	1	4	4	1	4	5
	14	PI-345588	USSR	2	80	3	4	100	4	4	5	1	4	4	1	4	5
	15	PI-371696	Alaska	1	80	3	4	100	4	4	5	1	4	4	-	-	-
	16	PI-371695	Alaska	2	60	4	4	100	3	4	5	1	4	4	-	-	-
	17	PI-372643	Alaska	3	60	4	4	80	6	7	-	-	-	-	-	-	-
	18	PI-372645	Alaska	2	85	3	4	90	4	6	-	-	-	-	-	-	-
	19	PI-372646	Alaska	2	65	4	4	90	4	6	-	-	-	-	-	-	-
	20	PI-372647	Alaska	3	60	4	4	90	3	6	-	-	-	-	-	-	-
	21	PI-372648	Alaska	2	65	4	4	90	5	6	-	-	-	-	-	-	-
	22	PI-371698 1/	Alaska	2	70	4	4	90	5	6	-	3	5	6	-	-	-
40	22	PI-372650 1/	Alaska	2	60	3	4	100	3	3	-	2	5	5	2	4	5

1/ Var. unilaterate
 2/ Rating 1=Excellent 5=Very Poor
 3/ Rating 1=Excellent 9=Very Poor 0=No Plants
 4/ Only the better stands were evaluated.

Table 2 - Summary of Agropyron trachycaulum Entries in the 7604 Initial Evaluation Planting
 Dryland Plots Seeded April 1976

Row No.	Acc or Var	Origin	1976	1977		1979			1980			1981			
			% Stand	% Stand	<u>1/</u> Vigor	<u>2/</u> Prod	% Stand	<u>1/</u> Vigor	<u>2/</u> Prod	% Stand	<u>1/</u> vigor	<u>2/</u> Prod	% Stand	<u>1/</u> vigor	<u>2/</u> Prod
83	Primar	Montana	60	10	4	4	75			85	2	4	85	2	4
85	San Luis	Colorado	75	100	3	3	95			95	2	4	95	2	4
84	C-25	"	0	90	2	3	85			85	2	4	-	-	-
85	EPC-119	"	50	90	3	3	85			85	2	4	95	2	4
87	EPC-139	"	50	90	3	3	85			85	2	4	95	2	4
88	EPC-173	"	30	80	4	4	85			85	2	4	95	2	4
89	EPC-259	"	35	80	2	2	75	2		65	2	5	-	-	-
90	EPC-282	"	5	-	-	-	85	2		75	2	5	-	-	-
91	EPC-589	New Mexico	5	-	-	-	55	3	5	65	2	5	75	2	5

1/ 1=Excellent 5=Very Poor
2/ 1=Excellent 9=Very Poor

Table 3 - Summary of Agropyron trachycaulum Species in 1977 Climax Field Evaluation Planting
Planted July 11, 1977

Acc or Var	Origin	1977		1978		1979		1980		1981	
		Stand	<u>1/</u> Vigor	Stand	<u>1/</u> Vigor	Stand	<u>1/</u> Vigor	Stand	<u>1/</u> Vigor	Stand	<u>1/</u> Vigor
Primar	Montana	2	5	5	3	9	8	-	-	9	6
San Luis	Colorado	2	2	2	2	3	3	6	3	4	4
EPC-119	"	3	2	2	3	2	3	6	2	3	4
EPC-173	"	2	6	9	8	-	-	-	-	-	-
EPC-819	"	3	5	2	4	3	4	2 <u>2/</u>	2	3	3

1/ 1=Excellent 9=Very Poor
2/ New seedlings invaded plot row.

Table 4 - Summary-Comparison of Stands and Vigor Ratings for Outstanding Accessions In All Trials

	1976		1977		1978		1979		1983		1981	
	% Stand	% Emergence	% Stand	1/ Vigor	% stand	1/ Vigor	% Stand	1/ Vigor	% stand	1/ Vigo	% Stand	1/ Vigor
Project 7606 Irrigated												
San Llds		95	90	3	100	1	-	4	95	4	95	4
EPC-119		95	90	2	100	2	-	4	95	4	95	4
EPC-139		85	90	3	100	2	-	4	95	4	95	4
EPC-173		95	90	2	100	2	-	4	95	4	95	4
EPC-259		85	85	2	100	3	-	4	95	4	95	4
PI-236714		85	75	3	100	3	-	-	-	-	-	-
PI-345588		85	80	3	100	4	-	5	95	4	95	4
PI-371694		95	80	3	100	4	-	5	95	4	-	-
Primar		85	75	3	100	2	-	4	95	4	95	4
Project 7604 Dryland												
San Luis	75		100	3	-	-	95	2	95	2	95	2
EPC-119	50		90	3	-	-	85	2	85	2	95	2
EPC-139	50		90	3	-	-	85	2	85	2	95	2
EPC-173	30		80	4	-	-	85	2	85	2	95	2
EPC-259	35		80	2	-	-	75	2	65	2	-	-
Primar	60		10	4	-	-	75	2	85	2	85	2
Project 7711 Climax												
San Luis			85	2	85	2	75	3	45	3	65	4
EPC-119			75	2	85	3	85	3	45	2	75	4
EPC-173			85	6	15	8	-	-	-	-	-	-
Primar			85	5	55	3	15	8	-	-	15	6

Legend:

1/ 1=Excellent 9=Very Poor