RELEASE NOTICE

OF

HIGH PLAINS GERMPLASM
SANDBERG BLUEGRASS
POA SECUNDA

SELECTED CLASS OF NATURAL GERMPLASM

by the

USDA-NRCS BRIDGER PLANT MATERIALS CENTER

and the

MONTANA STATE AGRICULTURAL EXPERIMENT STATION

and the

WYOMING STATE AGRICULTURAL EXPERIMENT STATION

This announces the release of 'High Plains germplasm' Sandberg bluegrass (*Poa* secunda), a early maturing, short stature grass indigenous to the Great Plains and the grasslands of the Pacific northwest. Although this species is considered a pioneer species on some disturbances, it is a component in climax grassland communities. There is no other release of this species.

Description: Sandberg bluegrass (*Poa* secunda J. Presl.) is a cool-season, perennial bunchgrass that matures early in the growing season. This grass is one of the first to green up in the spring, but is cured and dormant by early summer. The plant usually occurs as small tufts, with soft basal leaves and few to many flowering stalks that are naked except for two small leaves. The leaves have the typical bluegrass characteristics of prow-shaped tip and double grooves down the center of the leaf surface. Sandberg bluegrass has a prominent membranaceous, acute ligule. The seeds are glaucus except for short crisp hairs on the lower portion of the lemmas. The flowers are in narrow panicles that are somewhat spreading during anthesis. Plants seldom exceed 60 cm in height. Sandberg bluegrass has extensive, deep penetrating, coarse, fibrous roots that make it quite drought tolerant and resistant to grazing and trampling. This grass is considered an increaser in mid and short-grass prairies, mountain meadows, and foothills in south-central Canada and western United States (Dakotas west to Washington) south to Mexico. It has been found at elevations ranging from 300 to 3,650 meters. It grows well on medium texture soils but is most common on badlands, ridge tops, and dry, stony, or sandy soil. It is a pioneer species, one of the first grasses to colonize on surface manipulation sites and other moderate surface disturbances.

Origin: High Plains **(9078408)** is a composite of three accessions. **9019193** was collected on 6/22/80 by Mark Majerus near the Bessemer Bend of the North Platte River southwest of Casper, Wyoming (Natrona County). The collection site receives 300-350 mm of annual precipitation and is at an elevation of 1,590 meters. **9019198** was collected on 7/17/80 by Larry Holzworth and Mark Majerus from a grazing exclosure 25 kilometers southwest of Granger, Wyoming (Uinta County). The collection site receives 175-225 mm of annual precipitation and is at an elevation of 1,920 meters. **9026084** was collected in 1983 by Mack White on the Jim Meserve Ranch south of Gillette, Wyoming (Campbell County). The collection site receives 250-300 mm of annual precipitation and is at an elevation of 1,430 meters. All collections were made from native range sites dominated by needle and thread (*Stipa comata*), western wheatgrass (*Pascopyrum smithii),* and blue grama (*Bouteloua gracilis*).

Uses: Sandberg bluegrass is palatable to livestock early in the growing season, becoming less preferred in the summer when cured. By autumn it is frequently selected again. Deer, pronghorn antelope, and mountain sheep utilize Sandberg bluegrass forage and birds and small mammals utilize the seed. Because of the small stature and early maturity of this grass, it does not provide much usable forage. It is usually a minor component of most plant communities, but is still considered one of the six most important range grasses of the Intermountain and Pacific Northwest region. The anticipated use of commercially available Sandberg bluegrass seed is for inclusion in native mixtures for Conservation Reserve Program (CRP) plantings, wildlife habitat plantings, and native plant community restoration.

Area of Adaptation: This release is a composite of three collections made in northern, central, and southwestern Wyoming. Field testing indicate that this release is adapted for use in Montana, Wyoming, North Dakota, and southern Idaho. Based on the range of this species, there is every indication that this release could also be used in the Palouse country of Washington, as well as southward into Colorado and Utah, and northward into the prairie provinces of Alberta, Saskatchewan, and Manitoba.

Testing:

Initial Evaluation Plantings (IEP's):

Sandberg bluegrass collections made in the semi-arid and arid high plains of Wyoming and the foothills and mountain valleys of western Montana were established in Initial Evaluation Plantings on a coal strip-mine near Rock Springs, Wyoming, on a bentonite mine near Geybull, Wyoming, at the State Conservation Tree Nursery at Missoula, Montana, and at the Bridger Plant Materials Center.

IEP—Bridger Coal 1980 The evaluations at the Bridger Coal Mine east of Rock Springs, Wyoming were planted on October 7, 1980 (9 accessions) (Appendix Table 1), on April 29, 1981 (9 accessions) (Appendix Table 2) and on October 13, 1981 (12 accessions) Appendix Table 3). The Bridger Coal Mine IEP site was on reshaped and topsoiled strip-mine spoils. This site is has a short growing season (80-100 days), is at an elevation of 2,083 meters, high evapo-transpiration rates because high winds and high summer temperatures, high soil salinity, and low precipitation (150-250 mm annually). The top performing accession at this site was 9019198, with 9019193 making a respectable showing.

IEP Dresser Minerals 1981 Evaluations at the Dresser Minerals Bentonite Mine east of Greybull, Wyoming were planted on April 22, 1981 (8 accessions) (Appendix Table 4), on October 15, 1981 (13 accessions) Appendix Table 5), on April 28, 1982 (11 accessions) (Appendix Table 6), on October 20, 1982 (9 accessions) (Appendix Table 7), and on October 25, 1984 (6 accessions) (Appendix Table 8). The Dresser Minerals IEP site was also reshaped mine spoils with even more severe climatic and edaphic conditions. This site is at an elevation of 1,400 meters, receives 120-200 mm annual precipitation, and has a growing season of 90-110 days. At this site both 9019193 and 9019198 were considered the top performers. Those plants that were able to establish had good plant survival and longevity on these harsh sites.

IEP Missoula Conservation Nurserv 1983 An IEP was established on cultivated land provided by the State Conservation Tree Nursery in Missoula, Montana on October 26, 1983 (21 accessions) (Appendix Table 9). The Missoula IEP site was on cultivated soil, at an elevation of 975 meters, 350-400 mm annual precipitation, and a 125 day growing season. At the Missoula site 9019198, 9019193 and 9026084 were among the top five performers. These three accessions maintained the highest percent stand after five years of evaluation.

IEP Bridger PMC 1984 On October 19, 1984 ten accessions of Sandberg bluegrass were included in an IEP at the Bridger PMC on a dryland site (Appendix Table 10). The Bridger PMC IEP was on a cultivated, dryland site at an elevation of 1,120 meters, 280 mm annual precipitation, and a 120-135 day growing season. Only 9019193 was included in this IEP and it was not one of the top performers.

At these four IEP sites a total of 35 different accessions Sandberg bluegrass were evaluated. The accession 9019193 was seeded ten different times, 9019198 eight times, and 9026084 (a 1983 collection) was only seeded at the Missoula IEP site.

Comparative Evaluation Planting (CEP): Based on the results of the IEP's in the Arid Lands and Mountain/Foothills projects, the top five accessions were selected and established in a replicated (3 reps) study at the Bridger PMC on April 3, 1993. Each accession was established in four-row plots with 6-meter long rows and 0.3 meter row spacing. The site was sprinkler irrigated once each during the 1993 and 1994 growing season to ensure uniform establishment. The plots were evaluated for stand and vigor the establishment year, and sampled for forage and seed production in 1994 and 1995 (Table 1). In1995 the seed of the three best 1994 perform accessions was bulked and used to establish a 0.31 acre seed increase field at the Bridger PMC. It was decided to bulk these three accession because they had very similar seed maturation dates and plant uniformity and would provide a broad genetic base, originating from northeast, central, and southwest Wyoming.

Table 1. Comparative Evaluation Planting. Percent stand, vigor, forage production, and seed production of five accessions of Sandberg bluegrass in replicated plots at the Bridger PMC. Planted April 13, 1993.

		1993		1994		1995
Accession	Oriain	Stand	Vigor	Foraae	Seed	Foraae
		%	1/	kg/ha	kg/ha	kg/ha
9019198	Uinta County, WY	98	1.0	3631 a*	1851 a*	512 b*
9019193	Natrona County, WY	95	1.0	2364 b	1081 b	435 b
9026084	Campbell County, WY	95	1.7	2271 b	1214 b	526 b
9026640	Hot Springs County, WY	80	3.3	1427 c	212 c	1100 a
9026089	Carbon County, WY	92	2.0	1223 c	372 c	834 ab

- * Means within a column followed by the same letter are not significantly different as determined by an LSD
- test at the 5% level.
- 1/ Rated 1-9 with 1 best.

Seed Production: In the CEP plots at the Bridger PMC, forage and seed production was harvested on June 15, 1994 using a flail-type forage harvester. Harvesting was done at a time when the seeds were mature so that the ripe seed could be cleaned from the forage samples to determine seed production (Table 2). The top forage producers were also the top seed producers in 1994. The top three accessions (9019198, 9026084, and 9019193) produced 1,851 kg/ha, 1,214 kg/ha, and 1,081 kg/ha respectively. This is extremely high seed production but was sampled from test plots with 30 cm row spacing, and all seeds were collected, unlike that which would be collected if harvested with large seed production equipment, i.e., swather and combine. The seed sampled from these plots was used to establish a seed increase field. On April 12, 1995 the seed was planted with a two-row plant equipped with double disk openers, depth bands, and packer wheels. The row spacing was 90 cm. The stands were swathed when the seed was at the firm dough stage, dried in the windrow for 3-7 days and combined using a pick-up attachment. This 0.10 hectare field produced the following seed:

Harvest Date	Production (kg/ha)
6/24/96	345
8/19/97	504
6/25/98	15

As can be noted seed production was only good during the second and third years of the stand. Seed production dropped off drastically in the fourth year. This seed production field was furrow-irrigated to maintain the soil at field capacity and was fertilized with 90 kg/ha of available Nitrogen and 40 kg/ha of Phosphorus, usually in mid-September. When grown under irrigated and fertilized conditions, the plants reach a height of 90-100 cm, rather than the typical height of 30-50 cm when growing in native range sites.

Field Testing: Field testing of High Plains is somewhat limited. Seed has been sent out to other researchers in Montana, Idaho, Oregon, and Colorado. Most of the seed has been send out only within the last two years and results are not yet available (Table 2).

Table 2. Seed of 9078408 sent out for Research Purooses Onlv.

Ship to Address	Date Sent	Amount Provided
John Hardison, Oregon State Univ.	8/01/95	15 grams
Aberdeen, ID PMC	8/19/97	454 grams
Meeker, CO EPC	8/19/97	250 grams
Fort Belknap F.O., Harlem, MT	4/04/98	50 grams
Whitehall F.O., Whitehall, MT	11/4/98	2.121 kilograms
Jacy Gibbs, Wilder, ID	3/26/99	50 grams
Jordan F.O., Jordan, MT	4/01/99	1.361 kilograms
Ken Spaeth, Range Hydrol., Boise, ID	4/06/99	2.268 kilograms
Circle F.O., Circle, MT	4/12/99	4.400 kilograms
Meeker, CO EPC	6/24/99	254 grams
Lisa Larsen, West-Tech, Helena, MT	7/19/99	907 grams

Environmental Considerations: Sandberg bluegrass is a native perennial grass that is considered and increaser under heavy grazing conditions and is a pioneer (early colonizing species) on rangeland disturbances or rangeland surface manipulation sites. It will withstand heavy grazing and trampling, in part, because of its early maturing nature. This grass is a bunchgrass and seed shatter does not travel far from the parent plant. Seed may be consumed by songbirds, upland gamebirds, and small mammals and spread through feces. Sandberg bluegrass is not aggressive, and therefore should not be considered invasive (see attached Environmental Assessment). There are no commercial releases of this species. There is a demand for this species to include in seed mixtures for reclamation, critically disturbed sites, CRP, and wildlife plantings. The only source of seed at the present time is native harvests. Seed production in the wild is dependent on climatic conditions, thus native seed production and seed viability is often sporadic.

Availabilitv of Plant Materials: GO seed (equivalent to Breeder seed) will be maintained by the USDA-NRCS Plant Materials Center at Bridger, Montana and will be available through the Foundation Seed Program at Montana State University-Bozeman or the University of Wyoming.

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Appendix Table 1. Plant performance of accessions planted for reclamation of mined land and range revegetation. Rock Springs, WY. Seeded 10/7/80.

			1981		1982		1984		1985			1986			1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Stand	Foraae Prod.''	Stand	Vigor	Foraae Prod.	Stand	Vigor	Forage Prod.	Stand	Vigor	Stand	Vigor
			%	1/	%	1/	%	1/	%	1/	1/	%	1/	1/	%	1/	%	1/
9016282	Poa	sandbergii	0		0		5	6	5	5	6	5	5	5	5	7	5	8
9016284	Poa	sandbergii	1	7	5	5	20	5	5	4	5	5	5	5	5	7	5	8
9016285	Poa	sandbergii	0		0		15	5	10	4	5	5	5	5	1	7	1	8
9019193	**Poa**	**sandbergii**	**0**		**5**	**4**	**20**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**9**	***0***	
9019194	Poa	sandbergii	0		*0*		10	6	5	4	4	5	5	5	0		0	
9019196	Poa	sandbergii	0		**0**		15	4	5	4	4	5	5	5	1	7	0	
9019197	Poa	sandbergii	0		**5**	4	30	3	10	3	4	10	5	5	1	9	1	8
9019198	**Poa**	**sandbergii**	**1**	**5**	**20**	**3**	**50**	**2**	**30**	**3**	**3**	**30**	**3**	**3**	**25**	**5**	**10**	**7**
9019199	Poa	sandbergii	0		5	3	15	5	*0*			5	5	5	5	7	0	

1/ Rated 1-9 with 1 best.

Appendix Table 2. Plant performance of accessions planted for reclamation of mined land and range revegetation. Rock Springs, WY. Seeded 4/29/81.

			1981		1982		1984				1985		1986		1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Stand	Vigor	Forage Prod.	Ground Cover	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor
			%	1/	%	1/	%	1/	1/	1/	%	1/	%	1/	%	1/	%	1/
9016282	Poa	sandbergii	0		*0*		45	3	4	4	30	3	30	3	10	5	10	5
9016284	Poa	sandbergii	0		*0*		35	3	4	4	35	3	35	2	10	5	15	5
9016285	Poa	sandbergii	0		*5*	6	60	3	3	3	50	3	50	2	25	4	30	5
9019193	**Poa**	**sandbergii**	**0**		***0***		***55***	**3**	**4**	**4**	***50***	**3**	**40**	**5**	**25**	**5**	**20**	**5**
9019194	Poa	sandbergii	0		**0**		55	3	4	4	50	3	**40**	5	25	5	20	5
9019196	Poa	sandbergii	0		*0*		40	3	4	4	30	3	30	5	10	6	10	5
9019197	**Poa**	sandbergii	1	5	0		40	3	4	4	30	3	30	5	5	7	5	7
9019198	**Poa**	**sandbergii**	**1**	**4**	**5**	**5**	**65**	**2**	**3**	**3**	***60***	**2**	***60***	**1**	**35**	**3**	**35**	**4**
9019199	Poa	sandbergii	0		***0***		45	3	3	4	40	2	25	3	10	5	10	5

1/ Rated 1-9 with 1 best

Appendix Table 3. Plant performance of accessions planted for reclamation of mined land and range revegetation. Rock Springs, WY. Seeded 10/13/81.

			1981		1982		1984				1985		1986		1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Stand	Vigor	Forage Prod.	Ground Cover	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor
			%	1/	%	1/	%	1/	1/	1/	%	1/	%	1/	%	1/	%	1/
9016282	Poa	sandbergii	0		0		0				0		0		1	7	0	
9019193	**Poa**	**sandbergii**	**0**		**0**		**0**				**0**		**0**		**0**		**0**	
9019196	Poa	sandbergii	0		0		0				0		0		0		0	
9019197	Poa	sandbergii	**0**		0		0				0		0		0		0	
9019198	**Poa**	**sandbergii**	0		**0**		**0**				**0**		**0**		0		0	
9019199	Poa	sandbergii	0		**0**		0				0		0		5	9	1	5
9025639	Poa	sandbergii	0		0		0				***0***		0		0		1	8
9025640	Poa	sandbergii	1	3	0		0				0		0		5	9	5	7
9025641	Poa	sandbergii	0		0		5	5	7	7	5	5	5	9	1	9	5	7
9025647	Poa	sandbergii	0		10	9	0				0		0		5	9	1	7
9025648	Poa	sandberaii	0		0		0				0		0		1	9	0	
9025649	Poa	sandbergii	0		0		0				0		0		0		*5*	*7*

1/ Rated 1-9 with 1 best.

Appendix Table 4. Plant performance of accessions planted for reclamation of mined land and range revegetation. Greybull, WY. Seeded **4/22/81.**

			1981		1982		1984			1985			1986		1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Stand	Vigor	Forage Prod.	Stand	Vigor	Forage Prod.	Stand	Vigor	Stand	Vigor	Stand	Vigor
	1/		%	1/	%	1/	%	1/	1/	%	1/	1/	1/	%	1/	%	1/	%
9016282	Poa	sandbergii	5	4	15	2	30	5	5	20	3	5	25	3	15	5	15	3
9016284	Poa	sandbergii	1	5	10	3	30	4	4	20	4	5	30	4	25	5	25	3
9016285	Poa	sandbergii	20	3	20	3	40	4	4	30	3	4	35	3	25	4	25	3
9019193	**Poa**	**sandbergii**	**30**	**2**	**60**	**2**	**60**	**3**	**4**	**70**	**2**	**3**	**80**	**2**	***70***	**4**	***70***	**2**
9019196	Poa	sandbergii	45	2	70	2	70	3	4	60	3	4	75	3	70	3	70	2
9019197	Poa	sandbergii	60	2	40	3	40	4	5	35	4	5	35	4	30	5	30	3
9019198	**Poa**	**sandbergii**	**40**	**3**	**55**	**2**	**70**	**3**	**3**	**60**	**2**	**3**	**70**	**2**	**60**	**3**	**65**	**2**
9019199	Poa	sandbergii	20	4	60	2	50	5	5	40	**3**	5	40	4	25	5	25	**3**

1/ Rated **1-9** with 1 best

Appendix Table 5. Plant performance of accessions planted for reclamation of mined land and range revegetation. Greybull, WY. Seeded 10/15/81.

			1982		1983		1984				1985		1986		1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Stand	Vigor	Forage Prod.	Ground Cover	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor
			%	1/	%	1/	%	1/	1/	1/	%	1/	%	1/	%	1/	%	1/
9016282	Poa	sandbergii	**15**	**3**	**40**	**3**	**15**	**5**	**5**	5	**10**	**4**	**15**	**4**	**15**	**5**	**0**	
9016285	Poa	sandbergii	**40**	**3**	**60**	**2**	**35**	**3**	**4**	4	**25**	**3**	**25**	**3**	**25**	**3**	**5**	**7**
9019193	**Poa**	**sandbergii**	**50**	1	**70**	1	**40**	**3**	**3**	**4**	**25**	**3**	**50**	**2**	**40**	**4**	**40**	**4**
9019196	Poa	sandbergii	**20**	**3**	**35**	**3**	**40**	**3**	**4**	4	**20**	**2**	**40**	**2**	**30**	**3**	**30**	**4**
9019197	Poa	sandbergii	10	**3**	**20**	**3**	**5**	**5**	**6**	5	**5**	**2**	**5**	**2**	**5**	**3**	**5**	**2**
9019198	**Poa**	**sandbergii**	**30**	**2**	**50**	**2**	**40**	**3**	**3**	**3**	**15**	**3**	**35**	**2**	**30**	**3**	**30**	**3**
9019199	Poa	sandbergii	**0**		**0**		**0**				**0**		**0**		**0**		**0**	
9025639	Poa	sandbergii	**60**	**2**	**60**	**2**	**40**	**5**	**5**	4	**20**	**4**	**50**	**3**	**50**	**3**	**30**	**5**
9025640	Poa	sandbergii	**60**	**2**	**60**	**3**	**35**	**5**	**4**	4	**20**	**3**	**45**	**3**	**35**	**4**	**25**	**3**
9025641	Poa	sandbergii	**30**	**3**	**45**	**3**	**30**	**4**	**4**	4	**30**	**2**	**45**	**3**	**30**	**3**	**25**	**3**
9025647	Poa	sandbergii	**15**	**3**	**40**	**3**	**20**	**4**	**3**	4	**20**	**3**	**15**	**4**	**15**	**3**	**5**	**4**
9025648	Poa	sandbergii	**5**	**4**	**25**	**4**	**25**	**5**	**5**	5	10	**4**	10	**5**	10	**3**	10	**4**
9025649	Poa	sandbergii	**30**	**2**	**75**	**2**	**40**	**3**	**2**	**3**	**15**	**3**	**35**	**2**	**35**	**3**	**35**	**2**

1/ Rated **1-9** with 1 best

Appendix Table 6. Plant performance of accessions planted for reclamation of mined land and range revegetation. Greybull, WY. Seeded 4/28/82.

			1982		1983		1984		1985		1986		1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor
			%	11	%	1/	%	1/	%	1/	Yo	1/	%	1/	%	1/
9016282	Poa	sandbergii	**0**		**1**	**4**	**0**		**0**		**0**		**0**		**0**	
9019193	**Poa**	**sandbergii**	**0**		**1**	**3**	**5**	**4**	**0**		**0**		**0**		**0**	
9019196	Poa	sandbergii	**0**		**0**		**1**	**3**	**0**		**0**		**0**		**0**	
9019197	Poa	sandbergii	**0**		**0**		**0**		**0**		**0**		**0**		**0**	
9019198	**Poa**	**sandbergii**	**15**	**3**	**0**		**0**		**0**		**0**		**0**		**0**	
9019199	Poa	sandbergii	**0**		**0**		**5**	**3**	**0**		**0**		**0**		**0**	
9025639	Poa	sandbergii	**5**	**5**	**10**	**3**	**0**		**1**	**5**	**5**	**3**	**0**		**0**	
9025640	Poa	sandbergii	**20**	**2**	**5**	**3**	**1**	**3**	**0**		**0**		**0**		**0**	
9025641	Poa	sandbergii	**10**	**3**	**15**	**4**	10	**3**	**5**	**6**	10	**3**	**5**	**5**	**5**	**4**
9025648	Poa	sandbergii	**15**	**3**	**0**		**5**	**3**	**0**		**0**		**0**		**0**	
9025649	Poa	sandbergii	**0**		**5**	**4**	**5**	**4**								

1/ Rated **1-9** with 1 best

Appendix Table 7. Plant performance of accessions planted for reclamation of mined land and range revegetation. Greybull, WY. Seeded 10/20/82.

			1983		1984		1985		1986		1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor	Stand	Vigor
			%	1/	%	1/	%	1/	%	1/	Yo	1/	Yo	1/
9016282	Poa	sandbergii	30	5	0		50	5	30	2	0		0	
9019193	Poa	sandbergii	15	5	0		15	5	30	3	30	5	30	3
9019198	Poa	sandbergii	35	3	1	4	60	3	60	1	40	4	50	2
9025639	Poa	sandbergii	40	3	5	6	35	4	60	3	50	5	50	2
9025640	Poa	sandbergii	40	2	15	3	50	4	60	2	50	5	45	3
9025641	Poa	sandbergii	0		0		0		20	3	20	5	20	4
9025648	Poa	sandbergii	0		0		0		5	5	0		0	
9025649	Poa	sandbergii	0		1	4	15	5	20	2	20	5	30	3
9025933	Poa	sandbergii	0		0		5	3	5	2	5	4	5	3

1/ Rated 1-9 with 1 best

Appendix Table 8. Plant performance of accessions planted for reclamation of mined land and range revegetation. Greybull, WY. Seeded 10/25/84.

			1985		1986					1987		1988	
Accession	Genus	Species	Stand	Vigor	Stand	Vigor	Forage Prod.	Forage Unif.	Grd Cover	Stand	Vigor	Stand	Vigor
			%	1/	Yo	1/	1/	1/	1/	%	1/	%	1/
9019193	Poa	sandbergii	20	5	15	4	5	3	7	0		40	3
9039158	Poa	sandbergii	0		0					0		20	3
9039162	Poa	sandbergii	35	3	10	5	5	5	8	0		20	3
9039226	Poa	sandbergii	10	5	20	4	5	5	7	0		40	4
9039290	Poa	sandbergii	20	5	0					0		30	3
9039320	Poa	sandbergii	0		35	3	5	3	6	0		50	3

1/ Rated 1-9 with 1 best

Appendix Table 9. Performance of 559 accessions of grasses, legumes, forbs, and shrubs at the Sate Forest Tree Nursery, Missoula, MT, 1987. Seeded 10/26/83.

Accession	Genus	Species	Spring Stand	Spring Vigor	Fall Stand	Fall Vigor	Forage Prod.	Forage Unif.	Ground Cover	Seed Prod.	Seed Unif.
			%	1/	%	1/	1/	1/	1/	1/	1/
9016282	Poa	sandbergii	85	2	85	2	3	3	3	2	3
9016283	Poa	sandbergii	30	3	30	3	4	4	3	3	5
9016284	Poa	sandbergii	50	4	50	5	5	5	4	4	4
9016285	Poa	sandbergii	90	2	90	3	3	2	3	2	2
9019193	**Poa**	**sandbergii**	**100**	**1**	**100**	**2**	**3**	**2**	**3**	**2**	**2**
9019197	Poa	sandbergii	80	2	80	3	4	2	3	2	2
9019198	**Poa**	**sandbergii**	**95**	**2**	**90**	**2**	**3**	**2**	**3**	**2**	**3**
9025639	Poa	sandbergii	25	3	50	4	4	3	3	3	**4**
9025640	Poa	sandbergii	85	**2**	80	3	4	4	3	4	3
9025641	Poa	sandbergii	95	2	90	5	5	4	3	5	5
9025647	Poa	sandbergii	95	1	95	2	3	2	2	2	2
9025648	Poa	sandbergii	95	1	95	3	3	2	2	2	2
9025649	Poa	sandbergii	90	3	75	5	6	5	5	6	5
9025915	Poa	sandbergii	95	2	80	7	7	7	6	7	6
9025933	Poa	sandbergii	20	7	0	9					
9026084	**Poa**	**sandbergii**	**95**	**2**	**95**	**2**	**3**	**2**	**3**	**2**	**2**
9026088	Poa	sandbergii	95	3	90	5	6	6	5	6	5
9026089	Poa	sandbergii	70	2	85	3	3	3	3	3	3
9026092	Poa	sandbergii	75	3	80	2	3	3	3	3	3
9026100	Poa	sandbergii	15	4	20	5	5	6	4	5	6
9039049	Poa	sandbergii	80	1	90	2	3	2	3	2	2

1/ Rated 1-9 with 1 best

Appendix Table 10. Plant performance of accessions planted for reclamation of mined land and range revegetation. Bridger PMC. Seeded 10/19/84.

			1985				1986				1987				1988			
Accession	Genus	Species	Stand	Vigor	Forage Prod-	Grd. Cover	Stand	Vigor	Seed Prod.	Seed Unif.	Stand	Vigor	Seed Prod.	Seed Unif.	Stand	Vigor	Forage Prod	Grd Cover
			%	1/	1/	1/	%	1/	11	1/	%	1/	1/	1/	%	1/	1/	1/
9019193	**Poa**	**sandbergii**	**20**	**4**	**4**	**4**	**60**		**3**	**3**	**60**		**4**	**3**	**30**	**6**	***7***	***7***
9025840	Poa	sandbergii	0				0				*0*				*0*			
9025842	Poa	sandbergii	0				0				*0*				*0*			
9026090	Poa	sandbergii	10	**4**	5	**5**	20		4	6	*75*		5	4	75	3	5	**5**
9039158	Poa	sandbergii	65	3	4	**4**	80		3	5	65		6	5	35	5	6	**6**
9039162	Poa	sandbergii	80	1	2	**3**	90		1	1	90		3	3	80	4	5	**5**
9039169	Poa	sandbergii	65	3	3	**4**	75		3	3	70		5	*5*	45	3	6	**5**
9039190	Poa	sandbergii	40	3	4	**4**	50		4	3	40		*7*	4	25	4	7	**6**
9039226	Poa	sandbergii	65	2	3	**3**	85		3	3	80		7	5	20	5	7	**6**
9039290	Poa	sandbergii	70	3	3	**3**	80		3	**4**	85		*7*	5	30	3	*5*	**5**

1/ Rated 1-9 with 1 best

SIGNATURES FOR RELEASE OF
High Plains germplasm Sandberg bluegrass (Poa secunda)

Kenneth P. Vogel for

Shirley Gammon
State Conservationist
NRCS
Bozeman, Montana

2-23-00
Date

Lincoln Burton
State Conservationist
NRCS
Casper, Wyoming

3-14-2000
Date

Director
Montana Agricultural Experiment Station
Bozeman, Montana

2/25/00
Date

Director
Wyoming Agricultural Experiment Station
Laramie, Wyoming

3/27/00
Date

for Director
Ecological Sciences Division
NRCS
Washington, DC

4/25/00
Date