# Performance of Forage and Conservation Grasses in Northern Idaho

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### Introduction

Grassland farming is increasingly recognized as a centerpiece of agricultural sustainability. Perennial grasses play an essential role in soil and water conservation, and offer opportunities for agricultural income from soils unsuited to annual cropping. Many perennial cool-season grasses are adapted to northern Idaho. These follow generally similar patterns of growth and development, but vary in productivity, seasonal growth distribution, and suitability to environmental conditions and management schemes. Precipitation and temperature patterns determine periods of growth and timing of hay, silage, or pasture utilization. Cool, wet conditions during April-June (Figs. 1 and 2) can limit hay harvest opportunities and drying rates. Harvest conditions are usually better in July, when monthly precipitation is low and temperatures are high. Forage producers in northern Idaho must balance the opportunities and challenges presented by 1) risks of rain damage or slow curing if hay is mowed during May and June, when nutritional value is high; 2) soil water limitations to regrowth during July and August, when risks of weather damage are low; and 3) decreasing nutritional value with advancing maturity.

duction and soil conservation purposes in the Palouse region. Results of two multi-year grass trials are summarized here. A subsequent publication will address performance of perennial forage legumes in the Palouse region.

# Methods

Trials were established on Latahco silt loam soil at the University of Idaho Plant Science Farm, Moscow. Previous crops had been various perennial forages. The forage grass trial included entries expected to produce profitable levels of hay or silage, while the conservation grass trial emphasized entries expected to provide soil cover under lower levels of fertilization and utilization. Entries in each trial ranged in establishment rate, environmental adaptation, growth habit (upright to prostrate, short to tall, bunch-types and sod-formers), growth and development patterns, responsiveness to soil fertility and water levels, and expected stand life.

Seedbeds were prepared by harrowing and cultipacking. In each trial, certified seed (see Tables 3 and 6 for possible exceptions) of each entry was planted in four replicate 4.3- by 18-ft plots arranged in randomized complete blocks.

Opportunities for grass farming are excellent in much of northern Idaho, due to favorable environmental conditions, demand for highquality forage products, and current electric fencing, forage harvesting, and processing technology. Coupled with the need for environmentally-friendly and profitable cropping systems, these factors prompted the initiation of grass performance trials in 1992. Objectives were to evaluate the productivity of various perennial cool-season grasses for commercial forage pro-



Figure 1. Monthly precipitation for Moscow, Idaho, 1992-1996 and 30year (1961-90) means.



A small-plot drill with double-disk openers and press wheels placed seed 0.5 in deep in rows spaced 7 in apart. Bulk seeding rates (Table 1) of 30-60 pure live seeds/ft<sup>2</sup> reflected very good seedbed conditions, depth control, and soil firming. Higher rates would be recommended for less ideal conditions. Early rain in August and September of the seeding year contributed to excellent stand density in the forage grass trial by November, while conditions in the conservation grass trial were more variable. Nitrogen fertilizer application rate varied among trials (Table 2); other nutrients were applied as necessary to maintain levels of soil phosphorus (P), potassium (K), sulfur (S), and boron (B) at or near levels recommended in UI soil fertility management guides. Higher forage production levels would be expected in each trial at N rates of at least 100-120 lb N/ac, particularly for the most productive entries. Weeds were controlled by clipping, application of broadleaf herbicides, spot application of glyphosate, and hand removal.

Forage was flail-harvested to a 4-in stubble height from a 34-in-wide swath running the length of each plot. Dry matter (DM) production was expressed as oven-dry (98°F) forage. Commercial hay yields are probably no more than 80-90 percent of oven-dry plot yields, due to greater harvest losses under commercial conditions. Immediately prior to harvesting, canopy cover (percent of plot ground area covered by forage), weed content of total plot DM, and stage of growth (vegetative to postflowering; 10 tillers/plot) were recorded. Plots were trimmed to 4-6 in during fall or winter as necessary to remove excessive regrowth before the next season. Following the final year of harvesting in each trial, plots were maintained by mowing twice each growing season through 1997. Basal cover was assessed in September-October, 1997 on limited regrowth 2-2.5 months after mowing.

Cultivars were compared by analysis of variance (significance tested at P<0.05). Protected least significant differences (LSD) were calculated for DM production and maturity stage at 5 and 20 percent levels of probability that cultivar differences were due to chance alone. Yearly means below columns in Tables 3-6 represent only the set of cultivars for which data were complete across years. Annual precipitation (Fig. 1) was interpreted over the course of a growing year (September through August). Precipitation was below normal in 1993-94 and above normal in 1994-96. The effective growing season for forage grasses in northern Idaho is approximately April through July, after which growth typically ceases due to soil water depletion. Precipitation during this period was approximately 7, 12, 6, 8, and 11 in for 1992 through 1996, respectively, whereas the recent 30-year mean is 7 in. Monthly mean daily temperatures differed only slightly among years (Fig. 2), except for April through July of 1992 and 1994 when mean temperatures were as much as 4°F higher than for other years and the 30-year mean.



Figure 2. Monthly mean air temperature for Moscow, Idaho, 1993-1996 and 30-year (1961-90) means.

#### Forage grass trial

Entries (Table 3) of 15 species were seeded on September 4, 1992 into a summer-fallowed field. Tall fescue and perennial ryegrass cultivars probably varied in their level of infection with fungal endophytes that can lead to fescue toxicosis and ryegrass staggers in livestock. Nitrogen was applied at approximately 70-90 lb N/ac in April-early May of 1993-1996 (Table 2) and at 24 lb N/ac in late September, 1993. Soil test levels during 1991-1996 averaged pH 5.9, 2.9 percent organic

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matter, 8 ppm P, 142 ppm K, 3 ppm  $SO_4$ -S, and 0.4 ppm B. First cuttings were taken in 1993-1996 on a uniform date in early-mid June (Table 5) when the majority of the entries reached early- to mid-head stages of development. Second cuttings were taken in late July-early August when forage regrowth reached a height (18-24 in) considered economical to harvest or when regrowth ceased. Regrowth was insufficient in 1994 for a second cutting.

#### Conservation grass trial

Entries (Table 6) of 17 species were seeded on May 21, 1992. Due to late seeding and belownormal rainfall in May and June, plots were sprinkle-irrigated with 0.8 in of water on each of June 4 and 19, 1992. Nitrogen was applied annually at approximately 50-70 lb N/ac in April-early May of 1993-1995 (Table 2). Soil test levels during 1993-1995 averaged pH 5.9, 3.3 percent organic matter, 12 ppm P, 178 ppm K, 2 ppm SO<sub>4</sub>-S, and 0.5 ppm B. One cutting was taken annually on a uniform date in mid- to late-June (Table 8) when the majority of the entries reached mid- to full-head stages of development.

#### **Results** Forage grasses

Forage production and cultivar rankings varied among years (Table 3). Forage production ranged up to 10,725 lb DM/ac and was highest in 1994, with a relatively early single harvest

# Table 1. Seeding rates for entries in forage and conservation grass trials.

Species	Seeding rate
	Ib bulk seed/ac
Bluegrasses and timothy	1.5 - 3
Foxtails and orchardgrass	4 - 4.5
Hard and sheep fescues	4 - 4.5
Reed canarygrass	6
Dahurian wildrye and Idaho fescue	9
Perennial ryegrass and smooth brome	. 10
Great Basin and Russian wildryes	10 - 11
Indian ricegrass and wheatgrasses	10 - 15
Tall fescue	14
Meadow and mountain bromes	17
Altai wildrye	19
Prairie bromegrass	29

and below-normal rainfall. Prior to 1994, stands were probably still establishing to differing extents and roots may not have extended to their potential depth. Stand density and uptake of soil water and N may therefore have been higher in 1994 than in 1993. The small N application in September, 1993 may also have contributed to 1994 production. Production in subsequent years may have been more limited by available N levels than in 1994, perhaps as a consequence of soil N leaching from abovenormal rainfall. Forage production level did not appear to relate well to annual or growingseason rainfall. While many species consistently produced more than 6,000 lb DM/ac, tall fescue was often the most productive species across years. This may be related to its relatively deep rooting habit. Forage production was nonuniformly distributed across the season, with first harvest comprising approximately 65 to 90 percent of the total (Table 3). Orchardgrass and tall fescue tended to have better growth distribution than timothy, smooth brome, and perennial ryegrass. Ellett and Grasslands Pacific perennial ryegrasses are no longer marketed, due to anti-quality compounds. Palaton reed canarygrass is an improved, low-alkaloid cultivar. Many of the missing data in 1996 reflect poor regrowth, particularly for perennial ryegrass and intermediate wheatgrass. Stand life was short for Grasslands Matua prairiegrass and the Dahurian and Altai wildryes. Lack of persistence was also reflected in low cover values (Table 4) and corresponding high weed contents for the same entries. Russian wildryes, while perhaps more persistent than the other wildryes, did not compete well with weeds.

#### Table 2. Grass trials fertilization history.

Trial	Date	Rate and source
		lb/ac
Forage		
grasses	9/3/92	2000 lime, 20 S (gypsum)
•	5/5/93	68 N (34-0-0)
	9/28/93	24 N, 30 P2O5 (16-20-0)
	4/10/94	80 N, 12 S (40-0-0-6)
	5/4/95	90 N, 31 P2O5 (34-0-0 and 11-52-0
	5/9/95	20 S (gypsum)
	4/8/96	80 N, 12 S (40-0-0-6)
Conservation		
grasses	5/18/92	45 S (gypsum)
•	5/5/93	68 N (34-0-0)
	4/10/94	60 N, 9 S (40-0-0-6)
	5/2/95	20 S (gypsum)
	5/4/95	50 N (34-0-0)

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Basal cover in September, 1997 was lower for intermediate wheatgrasses than for most other adapted species.

First-harvest maturity stage varied widely each year (Table 5), as would be expected for such a broad collection. Considerable variation in maturation rate exists within orchardgrass, timothy, and perennial ryegrass in particular. Cultivars were not individually evaluated for maturity stage at second cutting in 1996. Regrowth harvests tended to be leafy, high-quality forage, with a few exceptions. More mature forage in the first cutting in 1993 may be related to a later harvest date than in other years.

#### Conservation grasses

Forage production and cultivar rankings varied among years (Table 6). Data for the bluegrasses and sheep and Idaho fescues were excluded in 1993 due to poor coverage or high weed content. Many of the data for Nezpar indian ricegrass and Joseph Idaho fescue are missing because these cultivars did not establish well. Plot cover of the bluegrasses and fine fescues, which establish slowly, increased from 1993 to 1995 (Table 7); most of these continued to increase through 1997. Intensive weed management may have contributed to much of this improvement in 1994. Weed content was particularly high in the establishment year in the bluegrasses, bluebunch wheatgrasses, and fine fescues. Forage production ranged up to 10,720 lb DM/ac and was highest in 1994, under below-normal rainfall. Possible explanations of annual variations in production are as for the forage grasses above. Many species consistently produced more than 5,000 lb DM/ac and provided adequate cover in 1994 and 1995. These included tall, intermediate, crested, and slender wheatgrasses, mountain brome, and Great Basin wildrye. Tegmar intermediate and Sodar thickspike wheatgrasses are low-statured cultivars released specifically for cover purposes. Ephraim crested wheatgrass is rhizomatous, whereas other crested wheatgrass cultivars are bunchgrasses. Although mountain brome and slender wheatgrass are considered short-lived species, stand life during the three harvest years appeared to be adequate for all entries except indian ricegrass and Idaho fescue. Basal cover in October, 1997 was below 50 percent for the latter two cultivars, Great Basin wildryes, and P-27 crested, Pryor slender, Snake River, and bluebunch wheatgrasses (Table 7). Many of the entries appear wellsuited for conservation purposes, and the more productive entries may be appropriate for commercial forage production, particularly under higher levels of N fertilization. While forage quality considerations may be less important for these entries than for those in the forage grass trial, harvest maturity stage varied less among these entries within each year than in the forage grasses (Table 8).

### Conclusions

A broad range of plant materials is available to suit forage production or soil and water conservation purposes. The trial periods did not permit tests of persistence beyond five years, but a few short-lived entries were identified in each trial. Forage grasses that performed well included timothy, tall fescue, orchardgrass, and smooth and meadow bromegrass. Forage grasses that did less well included the wildryes and some intermediate wheatgrasses. Conservation grasses that performed well included tall, intermediate, crested, slender, and thickspike wheatgrasses, Great Basin wildrye, and mountain bromegrass. Those that did less well included bluegrasses, fine fescues, and indian ricegrass. Because these data were obtained under mechanical harvesting and moderate soil fertility, they may not be representative of performance under grazing or marginal conditions. Many additional cultivars of certified orchardgrass, timothy, tall fescue, smooth brome, perennial ryegrass, and wheatgrasses are available from grassland seed dealers. These will vary in winter hardiness, maturation schedule, seasonal growth distribution, and stress tolerance. Although these trials did not assess forage quality directly, forage nutritional value would be expected to vary with maturity stage of the entries. The wide range in production and maturity characteristics within species such as orchardgrass, timothy, tall fescue, perennial ryegrass, and some of the wheatgrasses emphasizes the opportunities associated with appropriate selection of certified cultivars, rather than common seed. Species and cultivar selection should be based on a combination of site characteristics; plant performance and nutritional value; livestock production targets; and management programs.

Table 3. Forage grass dry matter production, 1993-1996.

	Forage dry matter production										
		Total season production* Proportion in first cutting									ng
Species	Cultivar	1993	1994**	1995	1996	Mean	1993	1994**	1995	1996	Mean
			-	—Ib DM/a	nc	· · · · ·	_	% of to	otal pro	duction-	
Timothy	Clair***	7941	9482	6334	8171	7982	68	100	77	95	85
Tall fescue	Fawn	5409	10725	8975	6210	7830	65	100	82	81	82
Tall fescue	Stellar	7070	10214	7352	6322	7740	58	100	76	78	78
Tall fescue	Safe	4962	10241	8138	5904	7311	60	100	79	81	80
Orchardgrass	Renegade	6337	9377	6391	6510	7154	63	100	80	91	84
Tall fescue	Cattle club	7067	10256	6507	4677	7127	59	100	78	80	79
Tall fescue	Courtenav	5402	9960	7000	5980	7086	64	100	75	82	80
California bromegrass	Deborah***	6309	8666	6923	6338	7059	77	100	88	91	89
Tall fescue	Desperado	6805	9001	6781	5554	7035	59	100	75	74	77
Timothy	Outlaw	6510	8807	5542	7144	7001	78	100	76	99	88
Intermediate wheatgrass	Rush	5486	8649	6804			86	100	80		
Smooth bromegrass	Badisson	5370	9859	7059	5232	6880	75	100	87	94	89
Orchardorass	Justus	5523	9591	5547	6550	6803	56	100	77	92	81
Meadow bromegrass	Fleet	4626	10234	6976	5312	6787	65	100	75	84	81
Timothy	Nosappu***	6156	8400	6135	6322	6754	65	100	77	93	84
Reed canaryorass	Palaton	6180	7824	6856	6083	6736	65	100	71	87	81
Timothy	Climax	6460	7607	5841	6923	6730	77	100	82	98	89
Orchardoraes	Bronc	5360	01/3	6030	6038	6647	65	100	82	04	85
Orchardoraes	Suborto	4602	0045	6208	6357	6508	53	100	80	04	82
Orchardgrass	Sameon	5330	8634	6021	5007	6406	60	100	71	00	80
Intermediate wheaterase	Beliant	6078	8702	5802	5150	6478	84	100	78	86	87
Moodow bromograss	Paddock	4605	0830	6378	4964	6440	67	100	70	84	81
Smooth bromograss	Magna	4090	9030	6000	4004	6492	75	100	10	04	01
Derephiel programs	Fllott	0230	GETA	4610	6170	0422	10	100	07	100	09
Orebordarooo	Dekete	6240	0014	4019	4040	6070	61	100	70	01	00
Orchardgrass	Dakola	0402	0442	6000	6007	02/9	01	100	19	91	00
Orcharograss	Palute	4029	9989	6000	5037	0204	04	100	89	94	8/
Intermediate wheatgrass	Chief	5/05	8379	6024	4008	61/9	66	100	00	88	91
Smooth bromegrass	Manchar	5004	0009	0202	3912	0104	02	100	88	90	60
Russian wildrye	Mankota		6203	5958			in	100	83	i.	
Creeping toxtail	Garrison	3429	/153	7439	6033	6013	49	100	85	94	82
Orchardgrass	Shilon	3999	9250	5/50	4628	5908	59	100	79	90	82
Tall tescue	Stef	4661	8332	6197	4433	5906	51	100	65	11	73
Smooth bromegrass	Badger	5207	7651	6231	4250	5835	68	100	86	94	87
Prairie bromegrass	Grasslands Matua	6420	5173				61	100			
Perennial ryegrass	Grasslands Pacific	7179	6008	3834	5775	5699	57	100	93	100	88
Intermediate wheatgrass	Manska	4912	8546	5858	2902	5555	85	100	88	78	88
Intermediate wheatgrass	Clarke	4163	6949	4857			78	100	83	in	
Perennial ryegrass	Bastion	6210	6281	3229	5544	5316	64	100	85	100	87
Meadow bromegrass	Regar	3301	8667	5122	4148	5310	57	100	73	85	79
Meadow foxtail	Dan	4108	5546	6219	5187	5265	65	100	81	98	86
Orchardgrass	Latar	4251	7582	3931	5184	5237	69	100	75	94	85
Russian wildrye	Swift		6890	3267				100	75		
Dahurian wildrye	Arthur	3905	6239	1000		1.2.1	80	100	1	÷	
Orchardgrass	Grasslands Wana	3977	6882	4224	3084	4542	52	100	65	89	77
Dahurian wildrye	James	3712	4876	*		*	76	100			
Perennial ryegrass	Condesa	5523	5573	2606	3443	4286	58	100	69	94	80
Russian wildrye	Bozoisky-Select	2339	6769	3614	•:		47	100	79		
Altai wildrye	Prairieland	2549	4799		¥.		49	100	•		
Altai wildrye	Eejay	1563	4978		•	•	53	100		•	•
Mean, entries common to	all years	5522	8581	6038	5419	6390	65	100	79	90	84
Standard error of mean		535	700	639	552						
LSD (0.05)****		1498	1961	1791	1562						
ISD (0.20)		976	1277	1167	1015						

\*Data excluded if mean cover <80% and/or mean weed content >20% within a year. Entries are ranked in order of mean production across years. \*\*Only one cutting was taken in 1994. \*\*\*Cultivars for which seed certification was uncertain.

\*\*\*\*Minimum value required for statistical difference between any two entries within a column.

Table 4. Forage grass ground cover, 1993-1997.

			Basal cover**				
Species	Cultivar	1993	1994	1995	1996	Mean	29-Sept, 1997
					% of ground a	irea	
Moodow fortail	Dan	00	100	07	00	00	05
ivieadow loxiali	Dan	99	100	97	99	99	95
Tall tescue	Stellar	100	100	96	97	98	92
Tall fescue	Safe	98	100	97	98	98	96
Orchardgrass	Shiloh	98	100	94	96	97	91
Tall fescue	Cattle club	99	100	96	91	97	98
Meadow bromegrass	Paddock	100	98	96	93	96	90
0.1.1	2		100				
Drchardgrass	Henegade	99	100	91	94	96	88
fall fescue	Stef	98	100	94	93	96	90
Tall fescue	Desperado	98	100	94	93	96	92
Tall fescue	Courtenay	96	100	92	95	96	91
Orchardorass	Dakota	00	95	02	04	05	86
Maadow bromograss	Elect	99	100	92	94	95	03
vieadow bromegrass	rieel	90	100	90	90	90	90
Meadow bromegrass	Regar	98	99	93	90	95	71
Drchardgrass	Justus	98	100	92	88	94	80
Orchardorass	Bronc	95	100	90	91	94	86
Timothy	Nosappu	95	100	87	01	03	84
Charles	Nosappu	95	100	07	51	90	04
Orcharograss	Sampson	94	99	91	90	93	80
Intermediate wheatgrass	Chief	99	100	90	84	93	75
Orchardorass	Paiute	94	99	89	91	93	90
Limothy	Outlaw	98	99	86	90	93	80
ntermediate wheetarees	Manaka	06	00	00	00	00	61
niermediale whealgrass	Mariska	90	90	00	69	93	01
Perennial ryegrass	Condesa	96	98	80	91	91	79
Reed canarygrass	Palaton	91	98	86	90	91	81
California bromegrass	Deborah	94	99	85	86	91	73
Poronnial nuograes	Ellott	05	06	90	02	01	75
Perennial ryegiass	Desting	00	50	00	52	01	15
Perennial ryegrass	Bastion	91	100	82	90	91	69
Smooth bromegrass	Radisson	94	96	89	83	91	71
Intermediate wheatgrass	Reliant	89	95	87	88	89	65
Intermediate wheatgrass	Clarke	94	94	89	78	89	69
Tall fescue	Fawn	75	100	78	98	88	96
Smooth bromegrass	Manchar	93	95	79	84	87	75
Creeping foxtail	Garrison	84	93	84	89	87	69
Intermediate wheatgrass	Rush	94	93	85	78	87	68
Timothy	Climay	86	96	74	88	86	71
Cmooth bromograpo	Magna	00	05	74	74	00	70
Smooth bromegrass	Magna	00	95	69	74	80	78
Perennial ryegrass	Grasslands Pacific	96	98	63	83	85	45
Timothy	Clair	84	89	73	87	83	72
Smooth bromegrass	Badger	73	100	70	89	83	83
Orchardorass	Suborto	84	95	72	77	82	61
Orcharderass	Latar	74	05	77	01	02	01
Orchardyrass	Casada da Ma	74	95	11	01	02	00
Jicharograss	Grassiands Wana	83	89	67	78	79	49
Russian wildrye	Swift	69	83	75	78	76	69
Russian wildrve	Bozoisky-Select	78	83	65	78	76	61
Altai wildrve	Prairieland	80	85	64	59	72	24
Duccion wildnes	Mankata	70	70	54	09	12	24
Hussian wildrye	Mankota	73	79	51		191	25
Dahurian wildrye	Arthur	88	85	32	*		
Dahurian wildrye	James	84	90	26	2	140	5000 1940
Altai wildrve	Feiav	68	60	35			26
Prairie bromegrass	Graselande Matua	54	40	16	×:		20
Tanle bronleyiass	Glassianus Malua	04	49	10	÷.		
Mean, entries common to all ve	ears	91	97	85	88	90	77

\*Data are averaged across harvests within years. Entries are ranked in order of mean cover across years. \*\*Assessment of limited regrowth 2 mo. after mowing.

Table 5. Forage	grass maturit	y stage,	1993-1996.
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1993         1994'         1995         1996         Meen**           Species         Cuttivar         27-Jul         2-1/2         16-1/2         2 <th cols<="" th=""><th></th><th></th><th colspan="10">Maturity stage</th></th>	<th></th> <th></th> <th colspan="10">Maturity stage</th>			Maturity stage									
Ist Cut         Znd Cut         Ist Cut         Znd Cut         Ist Cut         Znd Cut         Ist Cut         Znd Cut         Tat Cut <t< th=""><th></th><th></th><th colspan="2">1993</th><th>1994*</th><th>1</th><th>995</th><th>19</th><th colspan="2">1996</th><th>Mean**</th></t<>			1993		1994*	1	995	19	1996		Mean**		
Perennial nyegrass         Condesa         2         3         2         2         2         2         1         2           Russian wildrye         Bozcisky-Select         1         1         3.4         3         1         1         1-2         2           Russian wildrye         Markota         1         2         3.4         2         1         1         1-2         2           Russian wildrye         Markota         1         2         3.4         2         1         1         1-2         2           Russian wildrye         Markota         3         2         2         2         1         2         1-2         2           Intermediate heatgrass         Reliant         3         2         2         2         1-2         2           Intermediate heatgrass         Rush         3.1         2         2         2         2         1-2         2           Intermediate heatgrass         Pation         3         2         2         3         3.4         1         1         1-2         3           Intermediate heatgrass         Pation         3         2         3         3.4         1         1         <	Species	Cultivar	1st Cut 21-Jun	2nd Cut 27-Jul	1st Cut 2-Jun	1st Cut 9-Jun	2nd Cut 1-Aug	1st Cut 7-Jun	2nd Cut*** 6-Aug	1st Cut	2nd Cut		
Perennal nyegrass Condesa 2 3 2 2 2 2 1 2 1 2 2 Russian wildrye Baczoisky-Select 1 1 3 3,4 3 1 1 1 2 2 2 Russian wildrye Markota 1 2 3,4 2 1 2 1 2 2 2 Russian wildrye Switt 2 1 3,4 2 1 1 1 2 2 2 Meadow bromegrass Regar 3,4 2 3,4 1 1 1 1 2 2 2 Intermediate whatgrass Clarke 3 2 2 2 1 2 1 2 1 2 2 Dahutan wildrye James 2 1 2 2 2 1 2 1 2 1 2 2 Dahutan wildrye James 2 1 2 2 2 1 2 1 2 1 2 2 Dahutan wildrye James 2 1 2 2 2 2 2 2 2 1 2 2 2 Dahutan wildrye James 2 1 2 2 2 2 2 2 2 2 2 2 2 2 Dahutan wildrye James 3 1 2 2 2 2 2 2 2 2 2 2 2 2 2 Readow bromegrass Palaton 3 2 2 2 3 3 2 2 1 2 2 2 Readow bromegrass Palaton 3 2 2 3 3 4 1 1 2 2 3 Meadow bromegrass Palaton 3 2 2 3 3 4 1 1 2 3 Timothy Daspend 3 4 2 3 1 3 4 1 1 2 3 Timothy Nosepond 3 4 2 3 1 3 4 1 1 1 2 3 Timothy Nosepond 3 4 2 3 1 3 4 1 1 1 2 3 Timothy Nosepond 3 4 2 3 1 3 4 1 1 1 2 3 Timothy Nosepond 3 4 2 3 1 3 4 1 1 1 2 3 Timothy Nosepond 3 4 2 3 1 3 1 2 1 2 3 Orchardgrass Grasslands Wana 3 2 2 3 1 3 1 2 1 2 3 Orchardgrass Sanpson 3 4 2 2 3 2 3 1 3 1 2 3 Timothy Nosepond 3 4 2 3 1 3 1 2 1 2 3 Orchardgrass Sanpson 3 4 2 3 1 3 1 2 1 2 3 Orchardgrass Sanpson 3 4 2 3 1 3 1 2 1 2 3 Orchardgrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Orchardgrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Orchardgrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Orchardgrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Timothy Outaw 3 4 2 2 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Timothy Outaw 3 4 2 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 2 1 2 3 Timothy Clair 3 4 2 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 3 1 2 1 2 3 Timothy Clair 3 4 2 3 1 3 1 3 1 2 1 2 3 Timothy Clair 3 4 2 3 1 3 1 3 1 2 1 2 3 Timothy Clair 3 4 2 3 1 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 3 1 2 1 2 3 Timothy Clair 3 4 2 3 1 3 1 3 1 2 1 2 3 Timothy Clair 3 4 2 3 1 3 1 3 1 2 1 2 3 Smooth bromegrass Badfor 3 4 2 3 1 3 1 3 1 2							scale of	1-3.9****					
Russian wildrye         Bozoisky-Select         1         1         3.4         3         1         1         1.2         2.4           Russian wildrye         Swith         2         1         3.4         2         1         1         1.2         2           Russian wildrye         Swith         2         1         3.4         2         1         1         1.2         2           Intermediate wheatgrass         Chief         3         1         2         2         2         1.2         2         2         1.2         2         2         1.2         2         2         1.2         2         2         1.2         2         2         1.2         2         2         1.2         2         2         1.2         2         2         1.2         2         2         1.2         2         1.2         2         2         1.2         2         1.2         2         1.2         2         1.2         2         1.2         2         1.3         1.3         1.2         2         1.3         1.4         1.4         1.4         1.4         1.4         1.4         1.4         1.4         1.4         1.4         1.4	Perennial ryegrass	Condesa	2	3	2	2	2	2	1-2	2	2		
Russian wildrye         Mankola         1         2         3.4         2         1         2         1.2         2         1.2         2           Meadow bromegrass         Regar         3.4         2         1         1         1         1.2         2           Intermediate wheatgrass         Clarke         3         1         2         2         2         1.2         2           Datural value         James         2         2         2         1.2         2         2         1.2         2           Datural value         James         2	Russian wildrye	Bozoisky-Select	1	1	3.4	3	1	1	1-2	2	1		
Russian wildrye         Swith         2         1         3.4         2         1         1         1.2         2           Intermediate wheatgrass         Chief         3         1         2         2         2         1.2         2         2         1.2         2         3.3         3.3         1.3         1.2         2         3.3         3.3         1.2         3.3         3.3         1.2         3.3         3.3         1.2         3.3         3.3         1.2         3.3 <t< td=""><td>Russian wildrye</td><td>Mankota</td><td>1</td><td>2</td><td>3.4</td><td>2</td><td>1</td><td>2</td><td>1-2</td><td>2</td><td>2</td></t<>	Russian wildrye	Mankota	1	2	3.4	2	1	2	1-2	2	2		
Meadew bromegrass       Regar       3.4       2       3.4       1       2       2       2       1       2       2       1       2       1       2       2       1       1       1       2       2       1       1       1       2       2       1<	Russian wildrye	Swift	2	1	3.4	2	1	1	1-2	2	1		
Intermediate wheatgrass       Chief       3       1       2       2       2       1       2       2       1       2       1       2       2       1       2       2       1       2       2       1       2       2       1       2       2       1       2       2       1       2       2       1       1       1       2       2       1 <th1< td=""><td>Meadow bromegrass</td><td>Regar</td><td>3.4</td><td>2</td><td>3.4</td><td>1</td><td>1</td><td>1</td><td>1-2</td><td>2</td><td>2</td></th1<>	Meadow bromegrass	Regar	3.4	2	3.4	1	1	1	1-2	2	2		
Intermediate wheatgrass         Clarke         3         2         2         2         1         2         1-2         1-2         2           Dahurian wildrye         James         2         1         2         2         3         3.1         1-2         2           Dahurian wildrye         James         2         1         2         2         2         1-2         2           Intermediate wheatgrass         Marka         3.1         2         2         2         2         1-2         2           Tall fescue         Steft         3.4         1         2         3         1         1         1-2         3           Tall fescue         Desperado         3.4         2         3         1         1         1-2         3           Timothy         Nosappu         3         2         3         1         3         1-2         3           Timothy         Outaw         3.4         2         3         3         1-2         3           Timothy         Outaw         3.4         2         3.1         3         1-2         3           Timothy         Outawa         3.4         2         <	Intermediate wheatgrass	Chief	3	1	2	2	2	2	1-2	2	2		
Intermediate wheatgrass Peliant 3 2 2 2 2 1 2 1 2 1 2 1 2 1 2 1 1 2 1 2	Intermediate wheatgrass	Clarke	3	2	2	2	1	2	1-2 .	2	2		
Dahuan widrye         James         2         1         2         2         3         3.1         1-2         2           Intermediate wheatgrass         Manska         3.1         2         1         2         4         2         3         3         1         1         3         2         2         3         3         1         1         1         2         3         3         1         2         3         3         1         2         3         3         1         2         3         3         1         2         3         3         1         2         3         3         1         2         3         3         1         2         3         3 <t< td=""><td>Intermediate wheatgrass</td><td>Reliant</td><td>3</td><td>2</td><td>2</td><td>2</td><td>1</td><td>2</td><td>1-2</td><td>2</td><td>2</td></t<>	Intermediate wheatgrass	Reliant	3	2	2	2	1	2	1-2	2	2		
Intermediate wheatgrass         Rush         3.1         2         2         2         2         2         1-2         2           Tall fescue         Stef         3.4         1         2         2         2         2         1-2         2           Tall fescue         Stef         3.4         1         2         3         2         2         3         2         2         3           Charargyrass         Pation         3         2         2         3         1         1         1-2         3           Meadow bromegrass         Patotock         3.4         1         3         1         1         1-2         3           Timothy         Nosappu         3         2         3         1         3         1         2         1-2         3           Meadow tromegrass         Grassiands Wana         3         2         3         1         3         1         2         1-2         3           Timothy         Outnaw         3.4         2         3         3         1         2         1-2         3           Smoth bromegrass         Badger         3.4         2         3.1         3	Dahurian wildrye	James	2	1	2	2	3	3.1	1-2	2	2		
Intermediate wheatingss Manska 3.1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Intermediate wheatgrass	Rush	3.1	2	2	2	2	2	1-2	2	2		
Tail Escue       Stef       3.4       1       2       2       1       2       1-2       1-2       2         Reed canarygrass       Palaton       3       2       2       3       2       2       3       2       1       1       1-2       3         Meadow bromegrass       Phadock       3.4       1       3.4       1       1       1-2       3         Tail fescue       Desperado       3.4       2       3.1       3.4       1       1       1-2       3         Timothy       Nosapou       3       2       2       3       1       3       1-2       3         Meadow bromegrass       Fleet       3.4       1       3.4       1       1       1-2       3         Timothy       Otinax       3.4       2       2       3       3       3       1-2       3         Orchardgrass       Sampson       3.4       2       3.1       3       1       2       1-2       3         Timothy       Outlaw       3.4       2       3.1       3       1       2       1-2       3         Smoth bromegrass       Madger       3.4	Intermediate wheatgrass	Manska	3.1	2	2	2	2	2	1-2	2	2		
Reed caranygrass       Palaton       3       2       2       3       2       2       1       1       1.2       3         Orchardgrass       Paddock       3.4       1       1       1.2       3         Tail fescue       Desperado       3.4       2       3       3.4       1       1       1.2       3         Tail fescue       Catte club       3.4       2       3       3.4       1       1       1.2       3         Orchardgrass       Grasslands Wana       3       2       2       3       1       3       1.2       3         Orchardgrass       Grasslands Wana       3       2       2       3       1       1       1.2       3         Timothy       Outaw       3.4       2       2       3       3       1       2       1.2       3         Timothy       Outaw       3.4       2       3.1       3       1       2       1.2       3         Orchardgrass       Badger       3.4       2       3.1       3       1       2       1.2       3         Smoth bromegrass       Badger       3.4       2       3.1       3	Tall fescue	Stef	3.4	1	2	2	1	2	1-2	2	1		
Orchardgrass         Shiloh         3.7         2         3.4         2         1         1         1.2         3           Meadow hromegrass         Paddock         3.4         1         3.4         1         1         1.2         3           Tall fescue         Desperado         3.4         2         3.1         3.4         1         1         1.2         3           Timothy         Nosepul         3         2         3.1         3.4         1         1         1.2         3           Meadow homegrass         Grasslands Wana         3         2         3.1         3         1         2         1.2         3           Timothy         Oilmax         3.4         2         2         3         3         1.2         3         1         2         1.2         3         1.2         3         1.2         3         1.2         3         3         1.2         3         3         1.2         3         3         1.2         3         3         1.2         3         3         1.2         3         3         1.2         3         3         1.3         1.2         1.2         3         3         3	Reed canaryorass	Palaton	3	2	2	3	2	2	1-2	3	2		
Meadow bromegrass       Paddock       3.4       1       3.4       3       1       1       1.2       3         Tail rescue       Desperado       3.4       2       3       3.4       1       1       1.2       3         Tail rescue       Catte club       3.4       2       3       3.4       1       1       1.2       3         Orchardgrass       Grasslands Wan       3       2       2       3       1       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       1.2       3       3       1.2       3       3       1.2       3       3       1.2       1.2       3       3       1.2       3       3       1.2       1.2       3       3       1.2       1.2       3       3       1.2       1.2       3       3       1.2       1.2       3       3       1.2       1.2       3       3       3       3       3       1.2       1.3       1.3       3       1.2       3       3	Orchardorass	Shiloh	3.7	2	3.4	2	1	1	1-2	3	2		
Tail lescue         Desperado         3.4         2         3         3.4         1         1         1.2         3           Tail lescue         Cattle club         3.4         2         3.1         3.4         1         1         1.2         3           Timothy         Nosapuu         3         2         2         3         1         3         1.2         3           Orchardgrass         Grasslands Wana         3         2         3.1         3         1         2         1.2         3           Timothy         Ottimax         3.4         2         2         3         3         1.2         3           Timothy         Outlaw         3.4         2         2         3         3         1.2         3           Timothy         Outlaw         3.4         2         3.1         3         1         2         1.2         3           Smoth bromegrass         Badger         3.4         2         3.1         3         1         2         1.2         3           Timothy         Clair         3.4         2         3.1         3.1         2         1.2         3           Smoth bromeg	Meadow bromegrass	Paddock	3.4	1	3.4	3	1	1	1-2	3	1		
Initial Bescue       Cathe club       3.4       2       3.1       3.4       1       1       1.2       3         Timothy       Nosappu       3       2       2       3       1       3       1.2       3         Orchardgrass       Grasslands Wana       3       2       2       3       1       3       1.2       3         Orchardgrass       Fleet       3.4       1       3.4       3.4       1       1       1.2       3         Timothy       Otliaw       3.4       2       2       3       2       1.2       3         Orchardgrass       Latar       3.4       2       3.1       3       1       2       1.2       3         Orchardgrass       Latar       3.4       2       3.1       3       1       2       1.2       3         Smooth bromegrass       Badger       3.4       2       3.1       3       1       2       1.2       3         Smooth bromegrass       Magna       3.4       2       3.1       3.4       1       2       1.2       3         Tall fescue       Stellar       3.4       2       3.1       3.4       2	Tall fescue	Desperado	34	2	3	34	i	i	1-2	3	2		
Intersport       Octate fund       O.4       P       O.1       O.4       T	Tall foscue	Cattle club	3.4	2	31	3.4	i.	i	1-2	3	2		
Initially       Nosappu       0       2       2       3       1       3       12       3         Meadow bromegrass       Fleet       3.4       1       3.4       3.4       1       1       12       3         Imothy       Outlaw       3.4       2       2       3       2       3       1.2       3         Timothy       Outlaw       3.4       2       2       3       3       1.2       3         Timothy       Outlaw       3.4       2       2       3       3       1.2       3         Crhardgrass       Latar       3.4       2       3.1       3       1       2       1.2       3         Smoth bromegrass       Badger       3.4       2       3.1       3       1       2       1.2       3         Smoth bromegrass       Manchar       3.4       2       3.1       3       1       2       1.2       3         Tall fescue       Stellar       3.4       2       3.1       3.4       1       2       1.2       3         Tall fescue       Courtenay       3.4       2       3.1       3.4       1       3.1       2.2	Timothy	Nosappu	3	2	2	2	4	3	1.2	3	2		
Orchardigass         Detastation variat         3         2         3.1         3         1         2         1.2         3           Meadow bromegrass         Letar         3.4         2         2         3         3         1         2         1.2         3           Timothy         Outlaw         3.4         2         2         3         3         1.2         3           Chardigrass         Latar         3.4         2         2         3         3         1.2         3           Cronardigrass         Sampson         3.4         2         3.1         3         1         2         1.2         3           Smooth bromegrass         Madger         3.4         2         3.1         3         1         2         1.2         3           Smooth bromegrass         Madder         3.4         2         3.1         3.4         1         2         1.2         3           Tall fescue         Safe         3.4         2         3.1         3.4         1         2         1.2         3.0           Tall fescue         Courtenay         3.4         2         3         3         1         3.1         1.2<	Oreborderase	Gracelande Wana	2	2	21	2	4	0	1-2	3	2		
Meadow Dromegrass       Preed       3.4       1       3.4       1       1       1.2       3         Timothy       Outlaw       3.4       2       2       3       2       3       1.2       3         Timothy       Outlaw       3.4       2       2       3       3       1.2       3         Orchardgrass       Latar       3.4       2       3.1       2       1       3       1.2       3         Smooth bromegrass       Badger       3.4       2       3.1       3       1       2       1.2       3         Smooth bromegrass       Magna       3.4       2       3.1       3       1       2       1.2       3         Smooth bromegrass       Machar       3.4       2       3.1       3.4       1       2       1.2       3         Smooth bromegrass       Machar       3.4       2       3.1       3.4       1       2       1.2       3         Tall fescue       Stellar       3.4       2       3.1       3.4       1       3.1       2       1.2       3.1         Tall fescue       Courtenay       3.4       2       3.1       3.4	Orcharograss Maadauu bromaaraaa	Glassianus waria	24	4	0.1	24	-	2	1.0		4		
Introly       Outlaw       3.4       2       2       3       2       3       1-2       3         Orchardgrass       Latar       3.4       2       3.1       3       1       2       1-2       3         Orchardgrass       Sampson       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Magna       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Magna       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Madisson       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Madisson       3.4       2       3.1       3.4       1       2       1-2       3         Tall fescue       Safe       3.4       1       3.1       3.4       1       2       1-2       3.0         Tail fescue       Courtenay       3.4       2       3       3       1       3.1       1-2       3.1         Perennial ryegrass       Grasslands Pacific       3.4       3.1 <td>Neadow bromegrass</td> <td>Fleet</td> <td>3.4</td> <td></td> <td>3.4</td> <td>3.4</td> <td>1</td> <td>0</td> <td>1-2</td> <td>3</td> <td>0</td>	Neadow bromegrass	Fleet	3.4		3.4	3.4	1	0	1-2	3	0		
Imotity       Outlaw       3.4       2       2       3       3       3       1-2       3         Orchardgrass       Sampson       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Badger       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Badger       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3.4       1       2       1-2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3.4       1       2       1-2       3         Tall fescue       Stellar       3.4       2       3.1       3.4       1       3.1       1.2       3.1         Tall fescue       Clair       3.4       2       3.1       3.4       1       3.1       1.2       3.1         Timothy       Clair       3.4       3.1 <t< td=""><td>Timothy</td><td>Climax</td><td>3.4</td><td>2</td><td>2</td><td>3</td><td>2</td><td>3</td><td>1-2</td><td>3</td><td>2</td></t<>	Timothy	Climax	3.4	2	2	3	2	3	1-2	3	2		
Orchardgrass         Latar         3.4         2         3.1         3         1         2         1-2         3           Smooth bromegrass         Badger         3.4         2         3.1         2         1         3         1-2         3           Smooth bromegrass         Magna         3.4         2         3.1         3         1         2         1-2         3           Smooth bromegrass         Madison         3.4         2         3.1         3         1         2         1-2         3           Smooth bromegrass         Machar         3.4         2         3.1         3.4         2         1-2         3           Smooth bromegrass         Machar         3.4         2         3.1         3.4         2         1-2         3           Tall fescue         State         3.4         1         3.1         2         1-2         3.1           Timothy         Clair         3.4         2         3         3         1         3.1         1.2         3.1           Perennial ryegrass         Grasslands Pacific         3.4         3.1         3.4         1         3.1         2.2         3.2	Timothy	Outlaw	3.4	2	2	3	3	3	1-2	3	2		
Orchardgrass         Sampson         3.4         2         3.1         2         1         3         1-2         3           Smooth bromegrass         Magna         3.4         2         3.1         3         1         2         1-2         3           Smooth bromegrass         Machar         3.4         2         3.1         3         1         2         1-2         3           Smooth bromegrass         Manchar         3.4         2         3.1         3         1         2         1-2         3           Tall fescue         Safe         3.4         1         3.1         3.4         2         1-2         3           Tall fescue         Stellar         3.4         2         3.1         3.4         1         2         1-2         3           Tall fescue         Courtenay         3.4         2         3         3         1         3         1-2         3.1           Timothy         Clair         3.4         2         3         3         1         3         1-2         3.2           Orchardgrass         Suborto         3.4         2         3.1         3.1         3.1         1.3.4	Orchardgrass	Latar	3.4	2	3.1	3	1	2	1-2	3	2		
Smooth bromegrass       Badger       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Magna       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3.4       2       2.1       2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3.4       1       2       1-2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3.4       1       2       1-2       3         Tall fescue       Stellar       3.4       2       3.4       3.4       1       2       1-2       3         Tall fescue       Courtenay       3.4       2       3       3       1       3.1       1.4       2       3.1       3.1       1.3       1.2       3.1         Prennial ryegrass       Grasslands Pacific       3.4       3.1       3.1       3.4       1       3.1       3.4       1       3.1       1.2       3.3         Prennial ryegrass       Babion       3.7       3       3.1       3.1 </td <td>Orchardgrass</td> <td>Sampson</td> <td>3.4</td> <td>2</td> <td>3.1</td> <td>2</td> <td>1</td> <td>3</td> <td>1-2</td> <td>3</td> <td>2</td>	Orchardgrass	Sampson	3.4	2	3.1	2	1	3	1-2	3	2		
Smooth bromegrass       Magna       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3       1       2       1-2       3         Smooth bromegrass       Manchar       3.4       2       3.1       3       1       2       1-2       3         Tall fescue       Stellar       3.4       2       3.1       3.4       1       2       1-2       3         Tall fescue       Stellar       3.4       2       3.1       3.4       1       2       1-2       3.0         Tall fescue       Countenay       3.4       2       3       3       1       3       1-2       3.0         Tall fescue       Countenay       3.4       2       3       3       1       3.1       3.4       1       2       1-2       3.0         Timothy       Clair       3.4       2       3       3       1       3.1       3.4       1       3.1       1.2       3.1         Orchardgrass       Baston       3.7       3       3       3.1       3.4       1.2       3.3         <	Smooth bromegrass	Badger	3.4	2	3.1	3	1	2	1-2	3	2		
Smooth bromegrass         Radisson         3.4         2         3.1         3         1         2         1-2         3           Smooth bromegrass         Manchar         3.4         2         3.1         3.4         2         2         1-2         3           Tall fescue         Safe         3.4         1         3.4         2         2         1-2         3           Tall fescue         Stellar         3.4         2         3.1         3.4         1         2         1-2         3           Tall fescue         Courtenay         3.4         2         3.1         3.4         1         2         1-2         3.0           Timothy         Clair         3.4         2         3         3         1         3.1         1.2         3.1           Orchardgrass         Suborto         3.4         2         3.1         3.4         1         3.1         1.2         3.2           California bromegrass         Bastion         3.7         3         3.1         3.4         1         3.1         1.2         3.2           California bromegrass         Bastion         3.7         2         3.4         3.4         1	Smooth bromegrass	Magna	3.4	2	3.1	3	1	2	1-2	3	2		
Smooth bromegrass       Manchar       3.4       2       3.1       3.4       2       2       1-2       3         Tall fescue       Stellar       3.4       2       3.1       3.4       1       2       1-2       3         Tall fescue       Stellar       3.4       2       3.4       3.4       1       2       1-2       3         Tall fescue       Fawn       3.4       2       3.4       3.4       1       2       1-2       3         Tall fescue       Courtenay       3.4       2       3.4       3.4       1       2       1-2       3.0         Timothy       Clair       3.4       2       3       3       1       3.1       1-2       3.1         Perennial ryegrass       Grasslands Pacific       3.4       2       3.1       3.4       1       3.1       1.2       3.2         Calibrinia bromegrass       Deborah       3.4       3       3.1       3.4       1       3.1       3.4       1       3.1       1.2       3.2         Calibrinia bromegrass       Bastion       3.7       3       3       3.1       3.1       3.4       1.2       3.3	Smooth bromegrass	Radisson	3.4	2	3.1	3	1	2	1-2	3	2		
Tail fescue       Safe       3.4       1       3.1       3.4       1       2       1-2       3         Tail fescue       Stellar       3.4       2       3.1       3.4       1       2       1-2       3         Tail fescue       Fawn       3.4       2       3.4       3.4       1       2       1-2       3         Tail fescue       Courtenay       3.4       2       3.4       3.1       3.4       1       2       1-2       3.0         Tail fescue       Courtenay       3.4       2       3       3       1       3.1       1.4       2       1.2       3.1         Timothy       Clair       3.4       2       3       3       1       3.1       1.4       2       3.1         Orchardgrass       Suborto       3.4       2       3.1       3.4       1       3.1       1.2       3.3         Perennial ryegrass       Bastion       3.7       3       3       3.1       1       3.4       1.2       3.3         Perennial ryegrass       Bastion       3.7       2       3.4       3.4       1       3.1       1.2       3.3         Orchard	Smooth bromegrass	Manchar	3.4	2	3.1	3.4	2	2	1-2	3	2		
Tall fescue       Stellar       3.4       2       3.1       3.4       1       2       1-2       3         Tall fescue       Fawn       3.4       2       3.4       3.4       1       2       1-2       3.0         Tall fescue       Courtenay       3.4       2       3.4       3       1       3       1-2       3.1         Timothy       Clair       3.4       2       3       3       1       3.1       1-2       3.1         Perennial ryegrass       Grasslands Pacific       3.4       2       3.1       3.4       1       3.1       1-2       3.2         California bromegrass       Deborah       3.4       2       3.1       3.4       1       3.1       1-2       3.2         California bromegrass       Deborah       3.4       3.1       3.4       1       3.1       1-2       3.3         Perennial ryegrass       Bastion       3.7       3       3       3.1       1       3.4       1-2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Bronc       3.7	Tall fescue	Safe	3.4	1	3.1	3.4	1	2	1-2	3	1		
Tall fescue       Fawn       3.4       2       3.4       3.4       1       2       1-2       3.0         Tall fescue       Courtenay       3.4       2       3       3       1       3       1-2       3.1         Timothy       Clair       3.4       2       3       3       1       3.1       1-2       3.1         Perennial ryegrass       Grasslands Pacific       3.4       2       3.1       3.4       2       3       1       3.1       1-2       3.1         Orchardgrass       Suborto       3.4       2       3.1       3.4       1       3.1       1-2       3.2         Orchardgrass       Bastion       3.7       3       3.1       3.4       1       3.1       1-2       3.3         Perennial ryegrass       Bastion       3.7       3       3       3.1       1       3.4       1-2       3.3         Perennial ryegrass       Bastion       3.7       2       3.4       3.4       1       3.1       1.2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3.1       1.2       3.4         Orchardgrass <td>Tall fescue</td> <td>Stellar</td> <td>3.4</td> <td>2</td> <td>3.1</td> <td>3.4</td> <td>1</td> <td>2</td> <td>1-2</td> <td>3</td> <td>2</td>	Tall fescue	Stellar	3.4	2	3.1	3.4	1	2	1-2	3	2		
Tall fescue       Courtenay       3.4       2       3       3       1       3       1-2       3.1         Timothy       Clair       3.4       2       3       3       1       3.1       3.1       1.2       3.1         Perennial ryegrass       Grasslands Pacific       3.4       2       3       3       1       3.1       1.2       3.2         Orchardgrass       Suborto       3.4       2       3.1       3.4       1       3       1.2       3.2         Orchardgrass       Deborah       3.4       3       3.1       3.4       1       3.1       1.2       3.3         Perennial ryegrass       Bastion       3.7       3       3.1       1       3.4       1       3.1       1.2       3.3         Perennial ryegrass       Bastion       3.7       3       3.1       1       3.4       1.2       3.3         Perennial ryegrass       Bastion       3.7       3       3.1       1.3       3.4       1       3.1       1.2       3.4         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3.1       1.2       3.4         Orcha	Tall fescue	Fawn	3.4	2	3.4	3.4	1	2	1-2	3.0	2		
Timothy       Clair       3.4       2       3       3       1       3.1       1-2       3.1         Perennial ryegrass       Grasslands Pacific       3.4       2       3.1       3.4       2       3       1       3.1       1-2       3.2         Orchardgrass       Suborto       3.4       2       3.1       3.4       1       3.4       2       3.3         California bromegrass       Deborah       3.4       3       3.1       3.4       1       3.1       1-2       3.3         Perennial ryegrass       Bastion       3.7       3       3.1       1       3.4       1       3.4       1.2       3.3         Perennial ryegrass       Bastion       3.7       3       3.1       1       3.4       1       3.4       1.2       3.3         Perennial ryegrass       Dakota       3.7       2       3.4       3.4       1       3.1       1-2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2 <t< td=""><td>Tall fescue</td><td>Courtenay</td><td>3.4</td><td>2</td><td>3</td><td>3</td><td>1</td><td>3</td><td>1-2</td><td>3.1</td><td>2</td></t<>	Tall fescue	Courtenay	3.4	2	3	3	1	3	1-2	3.1	2		
Perennial ryegrass       Grasslands Pacific       3.4       3.1       3.1       3.4       2       3       1-2       3.2         Orchardgrass       Suborto       3.4       2       3.1       3.4       1       3       1-2       3.2         California tromegrass       Deborah       3.4       3       3.1       3.4       1       3.1       1.2       3.2         Perennial ryegrass       Bastion       3.7       3       3       3.1       1.4       3.4       1.2       3.3         Perennial ryegrass       Ellett       3.4       3.1       3.4       1       3.4       1       3.4       1.2       3.3         Perennial ryegrass       Ellett       3.4       3.1       3.4       1       3.4       1.2       3.3         Creeping foxtail       Garrison       3       2       3.4       3.9       1       3.1       1.2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3       1.2       3.4         Orchardgrass       Banoc       3.7       2       3.4       3.4       1       3.4       1.2       3.4         Orchardgrass<	Timothy	Clair	3.4	2	3	3	1	3.1	1-2	3.1	2		
Orchardgrass         Suborto         3.4         2         3.1         3.4         1         3         1-2         3.2           California bromegrass         Deborah         3.4         3         3.1         3.4         1         3.1         1-2         3.3           Perennial ryegrass         Bastion         3.7         3         3         3.1         1         3.4         1-2         3.3           Perennial ryegrass         Ellett         3.4         3.1         3.1         3.4         1         3.4         1-2         3.3           Creeping foxtail         Garrison         3         2         3.4         3.9         1         3.1         1-2         3.3           Orchardgrass         Dakota         3.7         2         3.4         3.4         1         3         1-2         3.4           Orchardgrass         Justus         3.7         2         3.4         3.4         1         3.1         1-2         3.4           Orchardgrass         Bronc         3.7         2         3.4         3.4         1         3.1         1-2         3.4           Orchardgrass         Paiute         3.7         2         3.4	Perennial ryegrass	Grasslands Pacific	c 3.4	3.1	3.1	3.4	2	3	1-2	3.2	2		
California bromegrass       Deborah       3.4       3       3.1       3.4       1       3.1       1.2       3.3         Perennial ryegrass       Bastion       3.7       3       3       3.1       1       3.4       1.2       3.3         Perennial ryegrass       Ellett       3.4       3.1       3.1       3.4       1       3.4       1.2       3.3         Creeping foxtail       Garrison       3       2       3.4       3.9       1       3.1       1.2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3       1.2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1.2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3.1       1.2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1.2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1.2       3.5         Meadow foxtail       Dan	Orchardorass	Suborto	3.4	2	3.1	3.4	1	3	1-2	3.2	2		
Perennial ryegrass       Bastion       3.7       3       3       3.1       1       3.4       1-2       3.3         Perennial ryegrass       Ellett       3.4       3.1       3.1       3.4       1       3.4       1-2       3.3         Creeping foxtail       Garrison       3       2       3.4       3.9       1       3.1       1-2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.9       1       3.4       1-2       3.5         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Prairieland	California bromegrass	Deborah	3.4	3	3.1	3.4	1	3.1	1-2	3.3	2		
Perennial ryegrass       Ellett       3.4       3.1       3.1       3.4       1       3.4       1-2       3.3         Creeping foxtail       Garrison       3       2       3.4       3.9       1       3.1       1-2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.9       1       3.4       1-2       3.4         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Prairieland       1 </td <td>Perennial ryegrass</td> <td>Bastion</td> <td>3.7</td> <td>3</td> <td>3</td> <td>3.1</td> <td>1</td> <td>3.4</td> <td>1-2</td> <td>3.3</td> <td>2</td>	Perennial ryegrass	Bastion	3.7	3	3	3.1	1	3.4	1-2	3.3	2		
Creeping foxtail       Garrison       3       2       3.4       3.9       1       3.1       1-2       3.3         Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Benegade       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.4       1-2       3.5         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Eigay       2       1       2       1       2       1       2       2       1       2       2       1       2       2	Perennial ryegrass	Ellett	3.4	3.1	3.1	3.4	1	3.4	1-2	3.3	2		
Orchardgrass       Dakota       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Renegade       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3       1       3.4       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.5         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Eejay       2       1       3       1       2       1       1-2       .       1.2       .         Dahurian wildrye       Arthur	Creeping foxtail	Garrison	3	2	3.4	3.9	1	3.1	1-2	3.3	2		
Orchardgrass       Justus       3.7       2       3.4       3.4       1       3       1-2       3.4         Orchardgrass       Benegade       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3       1       3.4       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.5         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       .       .         Altai wildrye       Prairieland       1       1       2       2       1       3.7       .       1-2       .       .         Prairie bromegrass </td <td>Orchardgrass</td> <td>Dakota</td> <td>37</td> <td>2</td> <td>3.4</td> <td>3.4</td> <td>1</td> <td>3</td> <td>1-2</td> <td>3.4</td> <td>2</td>	Orchardgrass	Dakota	37	2	3.4	3.4	1	3	1-2	3.4	2		
Orchardgrass       Renegade       3.7       2       3.4       3       1       3.4       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Eejay       2       1       3       2       1       .       1-2       .         Altai wildrye       Arthur       2       1       2       1       .       1-2       .       .         Dahurian wildrye       Arthur       2       1       2       3       .       1-2       .         Mean, entries common to all years       3.2       2       3       3 <td>Orchardgrass</td> <td>Justus</td> <td>3.7</td> <td>2</td> <td>3.4</td> <td>3.4</td> <td>i -</td> <td>3</td> <td>1-2</td> <td>3.4</td> <td>2</td>	Orchardgrass	Justus	3.7	2	3.4	3.4	i -	3	1-2	3.4	2		
Orchardgrass       Bronc       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.1       1-2       3.4         Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.4         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Eejay       2       1       3       2       1       .       1-2       .         Altai wildrye       Prairieland       1       1       2       2       1       .       1-2       .         Dahurian wildrye       Arthur       2       1       2       1       .       1-2       .         Prairie bromegrass       Grasslands Matua       3.7       3.4       3.1       2       3       .       1-2       .         Mean, entries common to all years       3.2       2       3       3       1       2       1-2       3         Standard error of mean       0.2       0.3       0.2       0.4	Orchardgrass	Renegade	37	2	34	3	1	34	1-2	3.4	2		
Orchardgrass       Paiute       3.7       2       3.4       3.4       1       3.4       1-2       3.5         Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Eejay       2       1       3       2       1       .       1-2       .         Altai wildrye       Prairieland       1       1       2       2       1       .       1-2       .         Altai wildrye       Prairieland       1       1       2       2       1       .       1-2       .         Dahurian wildrye       Arthur       2       1       2       1       .       1-2       .         Prairie bromegrass       Grasslands Matua       3.7       3.4       3.1       2       3       .       1-2       .         Mean, entries common to all years       3.2       2       3       3       1       2       1-2       3         Standard error of mean       0.2       0.3       0.2       0.4       0.3       0.2       .       .       .         LSD (0 05)*****       0.6       0.7       0.5       0.2	Orchardgrass	Bronc	37	2	34	34	ં	31	1-2	34	2		
Meadow foxtail       Dan       3.7       2       3.4       3.9       1       3.4       1-2       3.6         Altai wildrye       Eejay       2       1       3       2       1       .       1-2       .         Altai wildrye       Prairieland       1       1       2       2       1       .       1-2       .         Altai wildrye       Prairieland       1       1       2       2       1       .       1-2       .         Dahurian wildrye       Arthur       2       1       2       1       .       1-2       .         Prairie bromegrass       Grasslands Matua       3.7       3.4       3.1       2       3       .       1-2       .         Mean, entries common to all years       3.2       2       3       3       1       2       1-2       3         Standard error of mean       0.2       0.3       0.2       0.4       0.3       0.2       .       .       .         I SD (0 05)*****       0.6       0.7       0.5       0.7       0.6       .       .	Orchardgrass	Painto	3.7	2	3.4	3.4	1	34	1-2	35	2		
Meadow loxall       Dail $3.7$ $2$ $3.4$ $3.6$ $1$ $0.4$ $1.2$ $0.6$ Altai wildrye       Eejay $2$ $1$ $3$ $2$ $1$ $.$ $1-2$ $.$ Altai wildrye       Prairieland $1$ $1$ $2$ $2$ $1$ $.$ $1-2$ $.$ Dahurian wildrye       Arthur $2$ $1$ $2$ $1$ $3.7$ $.$ $1-2$ $.$ $1-2$ $.$ Dahurian wildrye       Arthur $2$ $1$ $2$ $1$ $3.7$ $.$ $1-2$	Mondow foxtail	Dan	37	2	3.4	3.0	1	3.4	1-2	3.6	2		
Altai wildrye       Prairieland       1       1       2       1       .       1+2       .         Altai wildrye       Prairieland       1       1       2       2       1       .       1+2       .         Dahurian wildrye       Arthur       2       1       2       1       3.7       .       1+2       .         Prairie bromegrass       Grasslands Matua       3.7       3.4       3.1       2       3       .       1+2       .         Mean, entries common to all years       3.2       2       3       3       1       2       1+2       3         Standard error of mean       0.2       0.3       0.2       0.4       0.3       0.2       .         I SD (0.05)*****       0.6       0.7       0.5       0.1       0.7       0.6       -	Altoi wildow	Eciov	0.7	1	3.4	0.0	1	0.4	1.2	0.0	1		
Antal wildrye       Framerand       1       1       2       2       1       .       1*2       .         Dahurian wildrye       Arthur       2       1       2       1       3.7       .       1-2       .         Prairie bromegrass       Grasslands Matua       3.7       3.4       3.1       2       3       .       1-2       .         Mean, entries common to all years       3.2       2       3       3       1       2       1-2       .         Standard error of mean       0.2       0.3       0.2       0.4       0.3       0.2       .         I SD (0.05)*****       0.6       0.7       0.5       0.1       0.7       0.6       -	Altai wildiye	Brainialand	1	-	0	2	4	\$	1.2		4		
Danunan wildrye       Arthur       2       1       2       1       3.7       .       1-2       .         Prairie bromegrass       Grasslands Matua       3.7       3.4       3.1       2       3       .       1-2       .         Mean, entries common to all years       3.2       2       3       3       1       2       1-2       .         Standard error of mean       0.2       0.3       0.2       0.4       0.3       0.2       .         ISD (0.05)*****       0.6       0.7       0.5       0.1       0.7       0.6	Altal wildrye	Fraineianu	1		2	2	27		1-2				
Prairie bromegrass       Grassiands Matua       3.7       3.4       3.1       2       3       1-2       1-2       1-2       1         Mean, entries common to all years       3.2       2       3       3       1       2       1-2       3         Standard error of mean       0.2       0.3       0.2       0.4       0.3       0.2         LSD (0.05)*****       0.6       0.7       0.5       0.2       0.7       0.6       —	Danurian wildrye	Artnur Oneselende Meter	2		2	1	3.7		1-2		2		
Mean, entries common to all years         3.2         2         3         3         1         2         1-2         3           Standard error of mean         0.2         0.3         0.2         0.4         0.3         0.2         1         1         2         1         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         1         2         3         3         1         2         3         3         1         2         1         2         3         3         <	Prairie bromegrass	Grasslands Matua	a 3.7	3.4	3.1	2	3	*	1-2		3		
Standard error of mean         0.2         0.3         0.2         0.4         0.3         0.2           LSD (0.05)*****         0.6         0.7         0.5         0.'         0.7         0.6         —	Mean, entries common to	o all years	3.2	2	3	3	1	2	1-2	3	2		
LSD (0.05)***** 0.6 0.7 0.5 0. 0.7 0.6 -	Standard error of mean		0.2	0.3	0.2	0.4	0.3	0.2					
	LSD (0.05)*****		0.6	0.7	0.5	0.:	0.7	0.6	Ξ				

\*Only one cutting was taken in 1994. \*\*Entries are ranked in order of mean first cutting stage across years. \*\*\*Individual plot data were not collected; all entries were in stated range. \*\*\*\*Maturity designations: 1=vegetative, 2=elongating, 3=boot, 3.1=early head, 3.4=full head, 3.7=flowering, 3.9=post-flowering.

\*\*\*\*\*Minimum value required for statistical difference between any two entries within a column.

Table 6. Conservation grass dry matter production, 1993-1995.

			Dry matter	production*	
Species	Cultivar	1993	1994	1995	Mean
			lb	DM/ac	
Tall wheatgrass	Alkar	5559	10720	7558	7946
Great Basin wildow	Magnar	2014	10651	8173	7246
Intermediate wheetarees	Toomar	2314	0500	5000	7240
Intermediate wheatgrass	legmar	0100	9028	2620	/180
Crested wheatgrass	Hycrest	5701	8943	6863	7169
Mountain bromegrass	Bromar	6718	9636	4845	7066
Sheep fescue	Covar		9313	4434	•
Slander wheatgrass	Primar	6111	0000	5369	6926
Clender wheaterase	Perer	6419	9000	4600	6704
Siender wheatgrass	Pryor	0413	9301	4038	0/84
Crested wheatgrass	KIRK	3682	91/5	5830	6229
Kentucky bluegrass	Ginger	14	5486	6964	2
Crested wheatgrass	Ephraim	3433	8488	6474	6132
Crested wheatgrass	Nordan	2619	8605	6515	5913
Thickeniko whostarses	21076	4070	6605	6754	5007
Creat Basin wildre	Trailbaad	4212	0090	0754	5907
Great basin wildrye	Irainead	1966	8082	6/19	2290
Bluebunch wheatgrass	Goldar	3376	7610	5551	5512
Slender wheatgrass	Adanac	5607	6748	3532	5295
Canada bluegrass	Canon**		6084	4379	
Kentucky bluegrass	Troy**	1561	7574	6159	5098
Created wheaterase	D 07	0047	7006	5050	E070
Conside bluegrass	F-2/	2947	7230	0000	5079
Canada bluegrass	Reubens	0.00	0414	3704	1001
Snake River wheatgrass	Secar	2450	5186	7248	4961
Hard fescue	Durar	2643	7761	4087	4831
Big bluegrass	Sherman		2725	6774	Contraction of the second s
Bluebunch wheatgrass	Whitmar	1704	6681	5711	4698
Thickenika wheatarass	Critona	2200	6060	4221	4205
Unland bluggrass	Draular	2000	5770	4001	4323
Thiskenike wheeters	Draylar	2201	5/72	4000	4196
Thickspike wheatgrass	Elbee	2515	55/6	3244	3778
Thickspike wheatgrass	Sodar	1882	4830	2661	3125
Idaho fescue	Joseph				
Indian ricegrass	Nezpar	5		3	
Mean, entries common to all years		3692	7829	5552	5691
Standard error of mean		477	880	824	
ISD (0.05)***		1240	2400	0001	
150 (0.00)		1349	2490	2001	
LSD (0.20)		8//	1619	1515	

\*Data excluded if mean cover <80% and/or mean weed content >20% within a year. Entries are ranked in order of mean production across years. \*\*Cultivars for which seed certification was uncertain. \*\*\*Minimum value required for statistical difference between any two entries within a column.

Table 7. Conservation grass ground	cover,	1993-1997.
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			Basal cover**			
Species	Cultivar	1993	1994	1995	Mean	18-Oct, 1997
				% of gro	ound area	
Mountain bromegrass	Bromar	100	99	96	98	78
Slender wheatgrass	Primar	100	99	96	98	89
ntermediate wheatorass	Tegmar	98	100	98	98	95
nonnoulato nnoulgiaco	roginal				2.0	
hickspike wheatgrass	Elbee	95	100	99	98	96
hickspike wheatgrass	Critana	93	99	96	96	80
Thickspike wheatgrass	Sodar	90	99	93	94	93
crested wheatgrass	Hycrest	80	100	98	93	65
Slender wheatgrass	Pryor	95	98	84	92	45
Great Basin wildrye	Magnar	83	99	95	92	26
Slandar wheatarass	Adapac	93	98	84	91	88
Prosted wheatgrass	Kirk	88	95	91	91	74
Prested wheatgrass	Enhraim	80	95	98	91	74
Jiesleu wilealgiass	Cpinann	00	55	30	51	14
Thickspike wheatgrass	21076	95	94	81	90	51
Great Basin wildrve	Trailhead	80	95	90	88	26
3luebunch wheatgrass	Goldar	78	88	88	84	49
Created wheaterace	Nordan	79	00	82	93	66
	Aller	70	70	03	70	00
lall wheatgrass	Alkar	00	79	91	79	00
sluebunch wheatgrass	wnitmar	CO	00	64	70	1
Crested wheatgrass	P-27	68	74	79	73	47
Snake River wheatgrass	Secar	63	73	80	72	46
Hard fescue	Durar	58	74	80	70	89
a - 12 - 22			-			
Kentucky bluegrass	Troy	50	74	84	69	94
Canada bluegrass	Reubens	58	73	71	67	95
Jpland bluegrass	Draylar	55	69	71	65	81
Canada bluegrass	Canon	50	58	64	57	94
Sheen fescue	Covar	25	60	79	55	84
Big bluegrass	Sherman	23	54	78	51	70
		1.5.1.4.1 2.1.1.1.1	200			
Kentucky bluegrass	Ginger	28	54	66	49	98
daho fescue	Joseph	25	30	40	32	13
Indian ricegrass	Nezpar	38	8	9	18	5
Mean		70	80	81	77	67

\*Entries are ranked in order of mean cover across years. \*\*Assessment of limited regrowth 2.5 mo. after mowing.

Table 8. Conservation grass maturity stage, 1993-1995.

			Maturi	ty stage	
Species	Cultivar	1993 23-Jun	1994 13-Jun	1995 12-Jun	Mean*
			scale o	f 1-3.9**	-
Slender wheatgrass	Adanac	3.1	3	2	3
Tall wheatgrass	Alkar	3.1	3	2	3
Idaho fescue	Joseph	3	3.4	2	3
Intermediate wheatgrass	Tegmar	3.4	3	2	3
Great Basin wildrye	Trailhead	3.4	3.1	2	3
Thickspike wheatgrass	Elbee	3.4	3.4	2	3
Thickspike wheatgrass	Sodar	3.4	3.4	2	3
Great Basin wildrve	Magnar	3.4	3.1	3.1	3.2
Slender wheatgrass	Primar	3.4	3.1	3.1	3.2
Canada bluegrass	Canon	3.4	3.4	3.1	3.3
Mountain bromeorass	Bromar	3.4	3.4	3.1	3.3
Kentucky bluegrass	Ginger	3.7	3.4	3	3.4
Bluebunch wheatorass	Whitmar	3.4	3.4	3.4	3.4
Big bluegrass	Sherman	3.4	3.4	3.4	3.4
Snake River wheatgrass	Secar	3.4	3.4	3.4	3.4
Canada bluegrass	Reubens	34	3.4	34	3.4
Crested wheatorass	Enhraim	34	34	34	3.4
Crested wheatgrass	Hycrest	3.4	3.4	3.4	3.4
Crested wheatgrass	Kirk	34	3.4	3.4	3.4
Crested wheatgrass	Nordan	3.4	34	3.4	3.4
Indian ricegrass	Nezpar	3.4	3.4	3.4	3.4
Shoon foscue	Covar	34	3.4	3.4	34
Created wheatgrass	P-27	3.4	3.4	3.4	3.4
Slender wheatgrass	Pryor	3.4	3.4	3.4	3.4
Thicksnike wheatgrass	21076	34	34	3.4	34
Thickspike wheatgrass	Critana	3.4	3.4	3.4	3.4
Upland bluegrass	Draylar	3.4	3.4	3.4	3.4
Bluebunch wheatgrass	Goldar	37	3.1	34	3.4
Kentucky bluegrass	Troy	37	34	34	35
Hard fescue	Durar	3.4	3.4	3.7	3.5
Mean		3.4	3.3	3.0	3.2
Standard error of mean		0.1	0.0	0.3	
LSD (0.05)***		NS	0.1	0.8	
LSD (0.20)		NS	0.1	0.5	

\*Entries are ranked in order of mean stage across years.

\*\*Maturity designations: 1=vegetative, 2=elongating, 3=boot, 3.1=early head, 3.4=full head, 3.7=flowering. \*\*\*Minimum value required for statistical difference between any two entries within a column. NS=no significant differences.

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