Contents

Due to Market Fluctuations and Availability, Prices Are Not Listed Please Call To Speak With A Sales Expert For Current Prices

Wind River Seed
3075 lane 51 1/2
Manderson, WY 82432
1-800-967-1798
1-307-568-3361
fax 1-307-568-3364
www.windriverseed.com

Three Building Blocks for Successful Reclamation

Our Staff:

Russ Holzhäuser - President
Lisa Hooper-Holzhäuser - CFO
M. Carli Flores- Receptionist
Ben Werner - Warehouse
Manuel Rodriguez - Warehouse
Mary Brown - Accounting

#1. Healthy Soil with Abundant Microlife, Good Humus and Tilth

#2. Vigorous Native Plant Growth and Establishment

#3. Soil Stabilization

OUR MISSION:

TO PROFIT BY CREATING A HIGHER STANDARD FOR QUALITY AND SERVICE IN THE SEED INDUSTRY AND TO OFFER A WIDE VARIETY OF SEEDS AT A FAIR MARKET PRICE TO OUR CUSTOMERS.

Legend

A - Annual
P - Perennial
B - Biennial
N - Native
I - Introduced
Forms: B - Bunch
S - Sod
Prec - Precipitation Range in inches - often listed as minimum requirement
Soil: 0 - Lowest
3 - Highest
C - Coarse
MC - Medium Coarse
M - Medium
MF - Medium Fine
F - Fine
Soil pH: 0 - Lowest
3 - Highest
A - Acidic
N - Neutral
B - Base
Rate - Seeding Rate in PLS Pounds per Acre
S/LB -Seeds per one pound
P/T - Planting Time
S - Spring
SU - Summer
F - Fall

There is only one proven time to stop noxious weeds - When you buy your seed

1-800-967-1798

WHY USE NATIVE SPECIES?

The use of natives is desirable in most dryland reclamation settings for a number of reasons. In the arid West a number of conditions exist which cause introduced varieties to fail. The frequency of extreme drought, duration of extreme drought and the high frequency of moderate drought render most tame pasture grasses such as orchardgrass, perennial ryegrass and bromegrass very risky solutions to long term problems. Reclamation planners must consider drought to be a virtual certainty when assessing adapted species.

There are some introduced varieties such as crested or Siberian wheatgrass which are drought tolerant but which are often unacceptable for other reasons. Ability to tolerate competition with a diverse community is a major drawback to these super aggressive species. Crested wheatgrass will drive out competing species and create mono-culture reclamation. Any mono-culture is then vulnerable to environmental stress which could destroy an entire reclamation effort due to disease or other stress.

Many of our native selections are grown and harvested right here at Wind River Seed and Absaroka Farms located in Worland, Wyoming. Listed below are a few we are especially proud of:

Fringed Sage
Prairie Sage
Northern sweetvetch
Penstemon procerus
Penstemon eatonii **or**
Firecracker
Penstemon grandiflorus

Call to inquire about these and many more!

1-800-967-1798

PURE LIVE SEED

A bag of seed consists of inert material such as dust, chaff, and empty seed; weed and other crop seed; and Pure Live Seed (PLS) of the desired species. A formula has been devised which allows customers to pay for only the pure live seed in a bag. To figure the Pure Live Seed percentage, multiply the purity percentage by the germination percentage of the seed lot. By then multiplying the Pure Live Seed percentage by the weight of the bag, one can determine the amount of pure live seed in the bag. Comparison of two lots of seed to determine the best value:

Lot A is labeled 98% pure with a 95% germination and costs $5.00 per bulk pound.
Lot B is labeled 89% pure with a germination of 92% and costs $4.75 per bulk pound.

Lot A: .98 x .95 = .931 PLS
Lot B: .89 x .92 = .819 PLS

Now divide the seed cost by the PLS percentage to determine the Pure Live Seed cost:

Lot A: $5.00 ÷ .931 = $5.37 per PLS pound
Lot B: $4.75 ÷ .819 = $5.80 per PLS pound

The lot which was less expensive on a bulk basis actually represents an inferior value on a PLS basis. Determining PLS prices before seed is purchased will help to adequately evaluate seed value.

Higher quality seed costs less to ship. Below is an example of how much seed would be shipped if 1000 PLS pounds were shipped:

Lot A: 1000 ÷ .931 = 1074 bulk pounds
Lot B: 1000 ÷ .819 = 1221 bulk pounds

Stretch your dollar and get better quality–
Ask for PLS pricing!

1-800-967-1798

Thickspike Wheatgrass

Agropyron dasystachyum

Native,
Long lived
Sod forming

Easy to establish, performs best loamy to sandy soils, more drought tolerant than western wheatgrass, used for erosion control and soil stabilization on disturbed range, roadways and revegetation sites, good palatability, excellent seedling vigor

Critana - MT a strong sod former
Bannock - released from ID has better forage yield

Bluebunch Wheatgrass

Agropyron spicatum and inerme

Native
Long lived
Bunchgrass

Valuable stabilizer, produces forage early in spring, not tolerant of excessive grazing, takes several seasons to reach optimum productivity, adapted to most soils but performs best on shallow, gravelly sites, used for livestock as well as disturbed areas

Goldar -ID, good seedling vigor
P-7 -genetic diversity
Whitmar (inerme) - beardless variety

Streambank Wheatgrass

Agropyron riparium

Native
Long lived
Sod forming

Most drought tolerant of the wheatgrasses, fast germination, poor seed production, strongly rhizomatous, low palatability, used for stabilization of disturbed sites, medium to coarse textured soils, low growing, stays green longer into the summer, requires little maintenance

Sodar -ID and WA, intended for conservation rather than grazing

refer to page 20 for additional information

Slender Wheatgrass

Agropyron trachycaulum

Native
Short lived
Bunchgrass

Used for rapid cover on disturbed sites, saline tolerant, can be used at higher elevations, adapted to medium textured, well drained soils, less drought tolerant than Western, seeds in late spring to early summer, easily established, diminishing after two years

Pryor -MT
longer lived and larger seed size
Revenue - CN
San Luis - CO for higher elevations

Mountain Brome

Bromus marginatus

Native
Short lived
Bunchgrass

Vigorous, rapid developing, tall grass that reaches full productivity within three years, volunteers on disturbed sites and does well at higher elevations in forest settings, will eventually be replaced by longer lasting species in the mix

Bromar- WA
Garnet - MT, WY, CO
longer lived, resistant to head smut

Canada Wildrye

Elymus canadensis

Native
Short lived
Bunchgrass

Tall, coarse, fast establishing, tufted, shallow fibrous root system, found in disturbed sites and roadsides, matures in late spring, lasts two to three years, requires more moisture than is usually available, used for quick forage production

Mandan - ND
more forage production

Basin Wildrye

Elymus cinereus

Native
Long lived
Large Bunchgrass

Tall, coarse grass, palatable in early spring before reaching maturity mid-summer, prefers moderate sandy to clay soils, one of the best producing grasses, takes 2-3 seasons for a full stand, good forage and cover for wildlife, used for erosion control and wind breaks, does well in overflow and subirrigated areas, not tolerant of heavy grazing

Magnar - WA
Trailhead - MT

Blue Wildrye

Elymus glaucus

Native
Short lived
Mid-sized Bunchgrass

Rapid developer, self fertile, fast germinating, quick cover in open woods and meadows, for erosion control along streambanks, burned and disturbed areas, prefers deep, moist, sandy loam soils, reaches maturity in mid June-July, seed in spring no more than ½" up to 1 lb PLS/ acre in mixes for best results

Elkton - OR

Beardless Wildrye

Leymus multicaulis

Introduced
Long lived
Sod forming

Mid-height-up to 3' tall, tolerant of early spring flooding and saline-sodic soils, used for early forage, soil stabilization and restoration areas, once established it is very hardy and able to stand up to weeds and invasives for many years, needs to be planted in fall for cool temperature to improve germination

Shoshone

Arizona Fescue
Festuca arizona

Native
Long lived
Bunchgrass

Fair seedling vigor, heavy, dense fibrous root system, prefers coarse textured soils, grows 1-3' tall, excellent for revegetation and stabilization of disturbed soils and rangeland restoration, similar to Idaho Fescue

Redondo

Idaho Fescue
Festuca idahoensis

Native
Long lived
Bunchgrass

Medium sized, fair seedling vigor, difficult to establish but once done is very competitive with other native grasses, most productive in deep silt and clay soils, often found on steep northern slopes, good fall and winter forage, can withstand heavy grazing, extensive root system and drought tolerance make it excellent for erosion control

Nezpurs
Joseph

Sheep Fescue
Festuca ovina

Native
Long lived
Tufted Bunchgrass

Attractive blue-green, low growing grass with shallow fibrous root system, poor to fair seedling vigor, hard to establish, adapted to most soil types, stand development in 2nd and 3rd year, cold and drought tolerant, not typically used for forage production, good revegetation candidate for high altitude, cool, dry areas, can make a drought tolerant lawn

Covar-WA
dwarf variety

Rough Fescue

Festuca scabrella

Native
Long lived
Dense Bunchgrass

Mid-sized grass with good seedling vigor, found in prairies, fair drought tolerance, best in deep sandy loam soils, not tolerant of flooding, palatable to elk and livestock, good producer for fall and winter pasture, however does not tolerate heavy grazing, more successful than most grasses on sandy gravelly soils, seed in early spring and late fall

Prairie Junegrass

Koeleria cristata

Native
Long lived
Tufted Bunchgrass

Rangeland grass, prefers coarse, silty to sandy soils, fibrous shallow roots, fair seedling vigor, good spring forage, does not tolerate heavy grazing, slightly aggressive, used in mixtures for reclamation on disturbed sites, erosion control and depleted ranges, should be allowed to reseed itself occasionally, not recommended for pure stands

Indian Ricegrass

Oryzopsis hymenoides

Native
Long lived
Bunchgrass

Medium sized, easy to establish, slow to germinate due to very hard seed coat, should be planted in fall, best on deep well drained sandy soils, grows throughout the summer, provides good winter forage, high in protein and fat, used in mixes, one of the most drought tolerant species

Nezpar - ID
Rimrock - MT

Alpine Bluegrass

Poa alpina

Native
Long lived
Tufted Bunchgrass

Short, grows at higher elevations, used in seeding mixtures for erosion control, reclamation and restoration, common in moist mountain meadows where precipitation ranges are higher, flowers in July and August, grazed by livestock and wildlife, not very aggressive but will seed in disturbed mountain areas, plant seed as soon as possible after disturbance occurs

Big Bluegrass

Poa ampla

Native
Medium lived
Tufted Bunchgrass

Slow to establish, moderate seedling vigor, begins growth very early in spring, medium height at 2-4' tall, good forage producer, becomes less palatable after maturity, seedlings should be allowed to establish before grazing, provides good game cover, can also be used for revegetative projects, one of few grasses that can compete with cheatgrass

Sherman- OR

Legend

A - Annual
P - Perennial
B - Biennial
N - Native
I - Introduced

Forms: B - Bunch, S - Sod
Prec - Precipitation range in inches - often listed as minimum requirement

Soil:
0 - Lowest
3 - Highest
C - Coarse
MC -MCoarse
M - Medium
MF - MFine
F - Fine

Soil pH:
0 - Lowest
3 - Highest
A - Acidic
N - Neutral
B - Base

Rate - Seeding Rate in pounds per Acre
S/P - Seeds per 1 pound
P/T - Planting Time
S - Spring
SU - Summer
F - Fall

GENUS	SPECIES	COMMON		N/I	FORM	PREC
Agropyron	cristatum	Crested	Wheatgrass	I	BU	10
Agropyron	dasystachyum	Thickspike	Wheatgrass	N	S	8
Agropyron	desertorum	Crested	Wheatgrass	I	BU	10
Agropyron	enlongatum	Tall	Wheatgrass	I	BU	8
Agropyron	spicatum	Bluebunch	Wheatgrass	N	BU	8
Agropyron	intermedium	Intermediate	Wheatgrass	I	S	14
Agropyron	riparium	Streambank	Wheatgrass	N	S	8
Agropyron	sibericum	Siberian	Wheatgrass	I	BU	6
Agropyron	smithii	Western	Wheatgrass	N	S	10
Agropyron	spicatum	Bluebunch	Wheatgrass	N	BU	8
Agropyron	spicatum x repens	Newhy	Wheatgrass	I	BU	1
Agropyron	trachycaulum	Slender	Wheatgrass	N	BU	16
Agropyron	trichophorum	Pubescent	Wheatgrass	I	S	14
Agrostis	tenuis	Colonial	Bentgrass	I	S	18
Alopecurus	arundinaceus	Creeping	Foxtail	I	S	25
Alopecurus	pratensis	Meadow	Foxtail	I	BU	25
Aristida	purpurea	Purple	Three-awn	N	BU	10
Beckmannia	syzigachne	American	Sloughgrass	N	S	25
Bromus	biebersteinii	Meadow	Brome	I	S	16
Bromus	intermis	Smooth	Brome	I	S	12
Bromus	marginatus	Mountain	Brome	N	BU	16
Dactylis	glomerata		Orchardgrass	I	S	18
Elymus	angustus	Altai	Wildrye	I	BU	18
Elymus	canadensis	Canada	Wildrye	N	BU	12
Elymus	cinereus	Great Basin	Wildrye	N	BU	8
Elymus	giganteus	Mammoth	Wildrye	I	BU	7
Elymus	glaucus	Blue	Wildrye	N	BU	13
Elymus	junceus	Russian	Wildrye	I	BU	12
Festuca	arizona	Arizona	Fescue	N	BU	14

COOL

C	MC	M	MF	F	A	N	B	RATE	S/LB	PT	VARIETIES
1	3	3	2	0	0	3	1	10-20	200000	F-S	Ephraim, Fairway
2	3	3	2	0	0	3	1	6-8	154000	F-S	Bannock, Critana
1	3	3	3	0	0	3	1	7-10	175000	F-S	Hycrest, Nordan
0	2	3	3	2	0	2	3	8-10	79000	S	Alkar, Jose
0	2	3	2	0	0	3	1	7-8	117000	F-S	Whitmar (beardless)
0	2	3	3	1	1	3	1	8	88000	F-S	Greenar, Oahe, Tegmar
0	1	3	3	2	0	3	1	6-8	156000	F-S	Sodar
1	3	3	2	0	0	3	1	6-8	170000	F	P-27, Vavilov
0	2	3	3	3	0	3	3	10	110000	F-S	Arriba, Rosana
0	2	3	3	1	0	3	1	6-8	140000	F-S	Goldar , Secar
0	2	3	3	1	0	2	3	12-14	122000	F-S	Newhy
0	2	3	2	0	0	3	2	6-8	97000	F	Pryor, Revenue, San Luis
1	2	3	3	0	1	3	1	10-12	100000	F	Greenleaf, Luna, Mandan, Manska
0	1	3	3	1	2	3	1	2	8700000	S-F	
0	0	3	3	2	2	3	1	1-4	900000	F-S	Garrison
0	0	3	3	2	2	3	1	4-5	580000	F-S	
1	3	2	0	0	0	3	1	6	250000	F-S-SU	
0	1	3	3	2	1	3	2	16	1150000	F-S	
0	2	3	3	1	1	3	0	10-12	86875	F-S	Regar, Paddock, Fleet
1	3	3	3	1	1	3	2	8	125000	F-S	Carlton, Lincoln, Manchar
0	1	3	3	1	0	3	1	10	90000	SU	Bromar, Garnet
0	1	3	2	1	2	3	0	2-3	654000	S	Latar, Paiute, Potomac
0	2	3	3	1	0	3	2	10-15	58300	F	
3	3	2	1	0	0	3	2	7	115000	F-S	Mandan
0	2	3	3	2	0	3	2	9	130000	F-S	Magnar, Trailhead
3	2	1	0	0	0	3	2	10	100000	F-S	Volga
1	3	3	1	0	0	3	1	9	110000	F-S	Elkton, Malhour
0	2	3	2	1	0	2	2	8-10	175000	F	Bozoisky, Swift
1	3	3	2	0	0	3	1	3	550000	F	Redondo

GENUS	SPECIES	COMMON		N/I	FORM	PREC
Festuca	arundinacea	Tall	Fescue	I	BU	16
Festuca	idahoensis	Idaho	Fescue	N	BU	12
Festuca	longifolia	Hard	Fescue	I	BU	16
Festuca	ovina	Sheep	Fescue	N	BU	10
Festuca	rubra	Creeping Red	Fescue	I	S	18
Festuca	scabrella	Rough	Fescue	N	BU	12
Koeleria	cristata	Prairie	Junegrass	N	BU	12
Leymus	multicaulis	Creeping	Wildrye	N	S	18
Leymus	shoshone	Beardless	Wildrye	N	S	18
Lolium	multiflorum	Annual	Ryegrass	I	S	10
Lolium	perenne	Perennial	Ryegrass	I	BU	12
Oryzopsis	hymenoides	Indian	Ricegrass	N	BU	9
Phleum	pratense		Timothy	I	BU	16
Poa	alpina	Alpine	Bluegrass	N	BU	20
Poa	ampla	Big	Bluegrass	N	BU	10
Poa	canbyi	Canby	Bluegrass	N	BU	10
Poa	compressa	Canada	Bluegrass	I	S	18
Poa	fendleriana		Muttongrass	N	BU	18
Poa	palustrus	Fowl	Bluegrass	I	BU	20
Poa	pratensis	Kentucky	Bluegrass	I	S	18
Poa	pratensis	Kentucky	Bluegrass	I	S	18
Poa	secunda	Sandberg	Bluegrass	N	BU	8
Puccinellia	nuttalliana	Nuttall	Alkaligrass	N	BU	14
Puccinellia	distans	Weeping	Alkaligrass	I	BU	15
Sitanion	hystrix	Bottlebrush	Squirreltail	N	BU	6
Stipa	columbiana	Columbian	Needlegrass	N	BU	12
Stipa	comata	Needle and Thread	Needlegrass	N	BU	10
Stipa	lettermanii	Letterman	Needlegrass	N	BU	18
Stipa	viridula	Green	Needlegrass	N	BU	16

COOL

C	MC	M	MF	F	A	N	B	RATE	S/LB	PT	VARIETIES
0	2	3	3	3	0	3	3	8	227000	S	Fawn
0	2	3	3	1	1	3	1	8	450000	F-S	Joseph, Nezpars, Winchester
1	2	3	3	2	2	3	0	10	565000	F-S	Durar
1	3	3	3	1	1	3	0	10	680000	F-S	Covar
1	2	3	3	1	2	3	0	10	500000	F-S	Badger
0	1	3	3	2	0	2	0	5	200000	F-S	
1	3	2	1	0	0	3	1	1-2	2315400	F	
2	3	3	2	1	0	2	3	15	170000	F-S	
2	3	3	2	1	0	2	3	15	170304	F-S	Shoshone
1	2	3	2	1	1	3	1	25-35	227000	S	Gulf
0	2	3	2	1	1	3	1	24-35	240400	F	Pasture and Turf Types
3	3	3	1	0	0	3	1	6-8	141000	F	Nezpar, Paloma, Rimrock
0	2	3	3	2	2	3	1	1	1163000	F-S	Climax
0	2	3	2	0	1	3	0	1	1000000	F-S	
1	3	3	2	1	1	3	0	5	882000	F-S	Sherman
1	2	3	2	1	0	3	1	2	926000	F-S	Canbar
0	1	3	3	1	2	3	1	1-2	2500000	F-S	Reubens, Talon
1	2	3	2	1	2	3	1	1	890000		
0	1	3	3	2	0	3	2	3	3156000	F-S	
0	2	3	3	1	1	3	1	2-3	2177000	F-S	Pasture-Ginger, Park, Troy
0	2	3	3	1	1	3	1	2-3	2177000	F-S	Turf-Midnight, Raven
1	3	3	3	1	1	3	2	2-4	925000	F-S	High Plains
0	0	2	3	1	0	2	3	3	2788700	F-S	
0	1	2	3	2	0	2	3	4	1200000	F-S	Fults
1	3	3	3	1	1	3	2	8-10	192000	F	
0	2	3	2	0	1	3	1	6-8	150000	F-S	
2	3	3	2	0	0	3	2	8	115000	F	
0	2	3	2	0	0	3	1	6-8	150000	F-S	
0	2	2	3	3	0	3	1	8-10	181000	F	Lodorm

Canby Bluegrass
Poa canbyi

Native
Long lived
Bunchgrass

Early spring growth, short stature, plants go into dormancy in late spring to maintain drought resistance, palatable while green to livestock, elk and deer, adapted to all soil textures especially shallow rocky soils, used in highway mixes to slow growth of weedy bromes and stabilize soils, due to slow establishment used in native seed mixtures only

Canbar- ID, WA, OR

Sandberg Bluegrass
Poa secunda

Native
Short lived
Bunchgrass

Short, dense, early maturing native bluegrass, used for early spring grazing, very palatable and nutritious for livestock and wildlife while green, difficult to establish due to poor seedling vigor and germination, best adapted to medium textured sandy/silty soils, in early spring drill ½- ¼" deep 1-2 PLS lb/acre

High Plains - MT

Nuttal Alkaligrass
Puccinellia nuttalliana

Native
Short lived
Sod forming

Tufted perennial grass with fibrous roots, up to 2' tall, narrow elongated leaves, somewhat palatable, good for stabilizing or restoring moist alkaline sites, adapted to a wide range of soils, high fire tolerance, low drought tolerance, slow growing, active growth period is late spring into summer, used in mixes to reseed waterways

Weeping Alkaligrass

Puccinellia distans

Introduced
Low growing
Bunchgrass

Tolerant of salty wet soils, easy to establish, fine shallow root system, grows in May and June reaching maturity from June to August, cold tolerant, will form pure stands, used for roadsides, reclamation and turf, moderate forage producer, can be planted in winter if surface moisture is adequate, for pure stands plant ½" deep at rate of 2-3 lbs PLS/ acre
Fults - CO

Bottlebrush Squirreltail

Sitanion hystrix

Native
Short lived
Bunchgrass

Widely adapted to most soil types, shallow root system, drought tolerant, saline tolerant, winter hardy, fire resistant, long awns, can compete with weeds which helps longer lived natives to establish, good winter forage, used for conservation, will dominate disturbed sites, plant ¼ - ½" deep, 7 lbs PLS/acre in pure stands in fall for best results

Columbian Needlegrass

Stipa columbiana

Native
Long lived
Bunchgrass

Perennial found at mid to higher elevations on drained loamy soils and rocky slopes, easy to establish, slow growth rate with seed maturity in July to August, drought tolerant, palatable to livestock and wildlife except during time of maturity, makes good winter forage, also used for revegetation, drill at shallow depth with seeding rate of 5-7 lbs PLS/acre

Needle-n-Thread
Stipa comata

Native
Long lived
Bunchgrass

Common to plains, prairies and foothills of western states, long awns that can cause injury to the tongue, throat, eyes and ears of livestock, good for erosion control and revegetation on disturbed sites, long seed dormancy, drought tolerant, prefers well drained sandy soils, drill ½ - 1" at 2-5 lbs PLS/acre (in mixtures) in fall

Letterman Needlegrass
Stipa lettermanii

Native
Long lived
Bunchgrass

Occurs at higher elevations, dry mountain meadows or sagebrush flats, easy to establish, requires 16-18" precipitation on loam, clay or semi-wet soils, used by wildlife but has little forage value for livestock, can be invasive if grazed too heavily, in mixes use 6-8 lbs PLS/acre, plant at a shallow depth from fall to spring

Green Needlegrass
Stipa viridula

Native
Long lived
Bunchgrass

Tall perennial with a fibrous root system, long twisting awns, slow to germinate, early spring growth, seed matures in June/July, very adaptive to many soils, fire tolerant, grows along streambanks, prairies and foothills, can be used for pasture but not as a pure stand, often used in mixes with Western wheatgrass and blue grama or legumes

Lodorm - ND

DON'T "CHEAT" YOUR RECLAMATION EFFORT

Cheatgrass and other weedy annual bromes will rob your young perennial seedlings of vital moisture and nutrients. Cheatgrass is also one of nature's most flammable materials. Why aren't these annual weeds listed as noxious weeds by regulatory agencies? Simply because control is difficult once they get started on a range. Since the law does not protect you from cheatgrass, you must protect your own land.

Some states allow up to 2% cheatgrass by weight in uncertified seed. That means: 163,200 cheatgrass seeds in a 50-pound bag of seed! Even certified, blue-tagged seed in some states is permitted to have 0.5% cheatgrass or other annual weedy bromes. This means 48,800 cheatgrass seeds per 50-pound bag of certified, blue-tagged seed!

Some seed has little or no cheatgrass; most seed has too much by our standards. As a buyer you have a right to insist upon a copy of the seed analysis. Look to see what weeds are present and in what quantities. Weed seeds may be expressed as a number of seed per pound or number of seeds per so many grams. To convert from per gram to per pound, use the following formula with the information provided on the seed test:

seeds/gram X 454 = seeds/pound

Wind River Seed purchases the best seed available from growers who make the extra effort to walk their fields and attempt to rogue out annual weeds. Oftentimes, however, the only seed on the market contains a small percentage of weed seed.

SODAR WHEATGRASS
Agropyron riparium

ORIGIN: *An improved native sod-forming wheatgrass collected near Canyon City, Grant County, Oregon, in an area of approximately 12 inches annual precipitation. It was released in 1954 by the Soil Conservation Service and the Idaho and Washington Agriculture Experiment Stations.*

DESCRIPTION: *Although commonly called streambank wheatgrass, Sodar has excellent drought tolerance. Its short growth form, vigorous sodding ability, narrow, lax leaves, seedling vigor, and longevity contribute to its excellence as an erosion control plant. It produces numerous stems and seed heads during the first two to three years, until it becomes fully sodded; thereafter seed head formation practically stops. It establishes easily from seed and does not become a weed. Mature plants are easily killed by normal tillage operations.*

ADAPTATION AND USE: *Sodar wheatgrass was selected and released as a special use grass for erosion control seedings within the semi-desert or better soil zones and on irrigated lands. Forage yields are very low, so it doesn't attract wildlife. It establishes and produces a good sod in areas with 6 inches or more rainfall. Soil adaptation ranges from shallow to deep, moderately coarse to fine textured, and moderately saline to slightly acidic. Once established, it provides an excellent barrier to weed invasions. It can be used on airport interspaces, road rights-of-way, fence rows, ditch and canal banks (lined and unlined), reservoir embankments, non irrigated playgrounds, farmyards, and as a cover crop in windbreaks and orchards. Its use in waterway seedings has not been consistent; many seedings have washed out prior to establishment. Sodar is crowded out if the site is too wet.*

SEEDBED: *A good, firm, weed-free seedbed is essential to the full success of the seeding. Most areas left bare following construction are weed-free and can be seeded in the late fall or early the first spring following construction. It can be planted at other times with irrigation, though germinates better in cool weather.*

SEEDING: *For lawns, seed 3 pounds per 1000 square feet. For large areas, seeding rates of 10 pounds per acre have been satisfactory. If broadcast at 10 pounds per acre, there are 40 seeds per square foot. Non irrigated seedings in the 12 inches or less precipitation zone should be done in late fall by drilling. Spring seedings establish well in the better moisture zones, or if irrigated. If a drill cannot be used, the seed may be broadcast and raked or harrowed in. Depth of planting should not exceed 1 inch.*

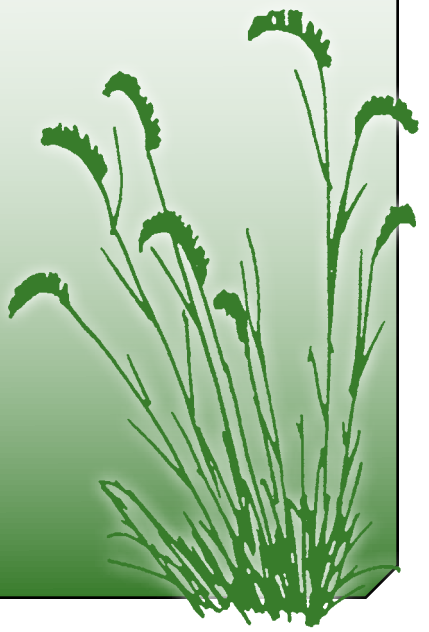
MANAGEMENT: *New seedings should be given full protection until completely established and a mowed no lower than 3 to 4 inches. Do not spray with 2, 4-D until the plants have 6 or more leaves. Nitrogen applied at 20-40 pounds per acre will aid*

establishment on low fertility sites in the 8 inch or better precipitation zones.

Adapted from information supplied by National Resource Conservation Service.

Establishing good pasture from seed can be difficult in Wyoming because of our uncertain weather, and there is not much that any of us can do about that.

However, through proper preparation and application we can at least make sure that if favorable weather occurs our seed will be ready to benefit to the utmost. Establishing good pasture requires an unbroken chain of favorable events.
(continued page 23)



Restoration Effectiveness Begins with Asking These Questions:

What are the objectives?
What preparation has been done for this particular site?
What species and varieties will best serve this site?
When will it be restored?
How will it be restored?
How much seed is needed and at what seeding rate?

1-800-967-1798

SHEEP FESCUE 'COVAR' FOR TURF

Festuca ovina

The variety Covar is better than other fine leaf fescues for drought tolerant turf. Keep in mind, none of the drought tolerant turfs will look like a lush, dark green Kentucky Bluegrass lawn. Nor will they be as tolerant to heavy traffic from dogs or other heavy use. But if you want to save time and water, a Covar lawn may well be satisfactory. Mow only twice a month in May and June, once a month in July and August. Sheep Fescue is slow growing, taking all summer to fill in, but is low maintenance once established, demanding very little water, mowing or fertilizer.

For a uniform appearance remove the existing lawn, spraying the entire area with glyphosate (Roundup and other brands) when the old turf is green and actively growing (taking care to keep the drift off desirable plants). Wait about a week for grass and weeds to die, then hoe shallowly. Water to see if any grass grows back and to encourage weed seeds to sprout. Spray again.

As for any new turf, prepare soil well, raking, smoothing, and rolling to create a firm seed bed. When you walk across a firm seed bed, your heel will depress only ¼ inch. Broadcast 0.6 pounds of seed per 1000 square feet. This will give you a thick coverage of 400 seeds per square foot. Use a drop spreader or mix the seed you will sow today with sand or soil to increase the volume, then make two passes as you scatter the seed, the second pass perpendicular to the first. Press seed firmly into the seed bed with a lawn roller partially filled with water; good seed/soil contact is essential for good germination. Water gently and keep moist until the little plants are showing (about 3-4 weeks), then taper off watering throughout the summer, watering deeply only when needed, to encourage deep, drought-tolerant roots.

Once the lawn is established, water just enough to keep it growing, to keep the fescue from going dormant. Mow at highest setting, since low mowing will damage the crowns and look brown. It will be a little clumpy, not smooth enough for croquet. The spring following establishment, fertilize at a low rate if desired, though may not be necessary if your soil is good.

Since Covar is a bunch grass, not rhizomatous like Kentucky Bluegrass, any holes will not fill in, but need to be re-seeded, so put some seed on a dry shelf for later. It is best to get a thick stand first try though, since the roots of the plants surrounding a bare spot will occupy the soil under the bare spot, inhibiting germination of new seed (you may need to disturb the roots under a bare spot before re-seeding). Rather than re-seeding small bare spots, you might wait a month; the plants around the edge often get large enough to fill in. Since Covar grows slowly, the lawn will look best the second year. Enjoy the summer without being a slave to your lawn!

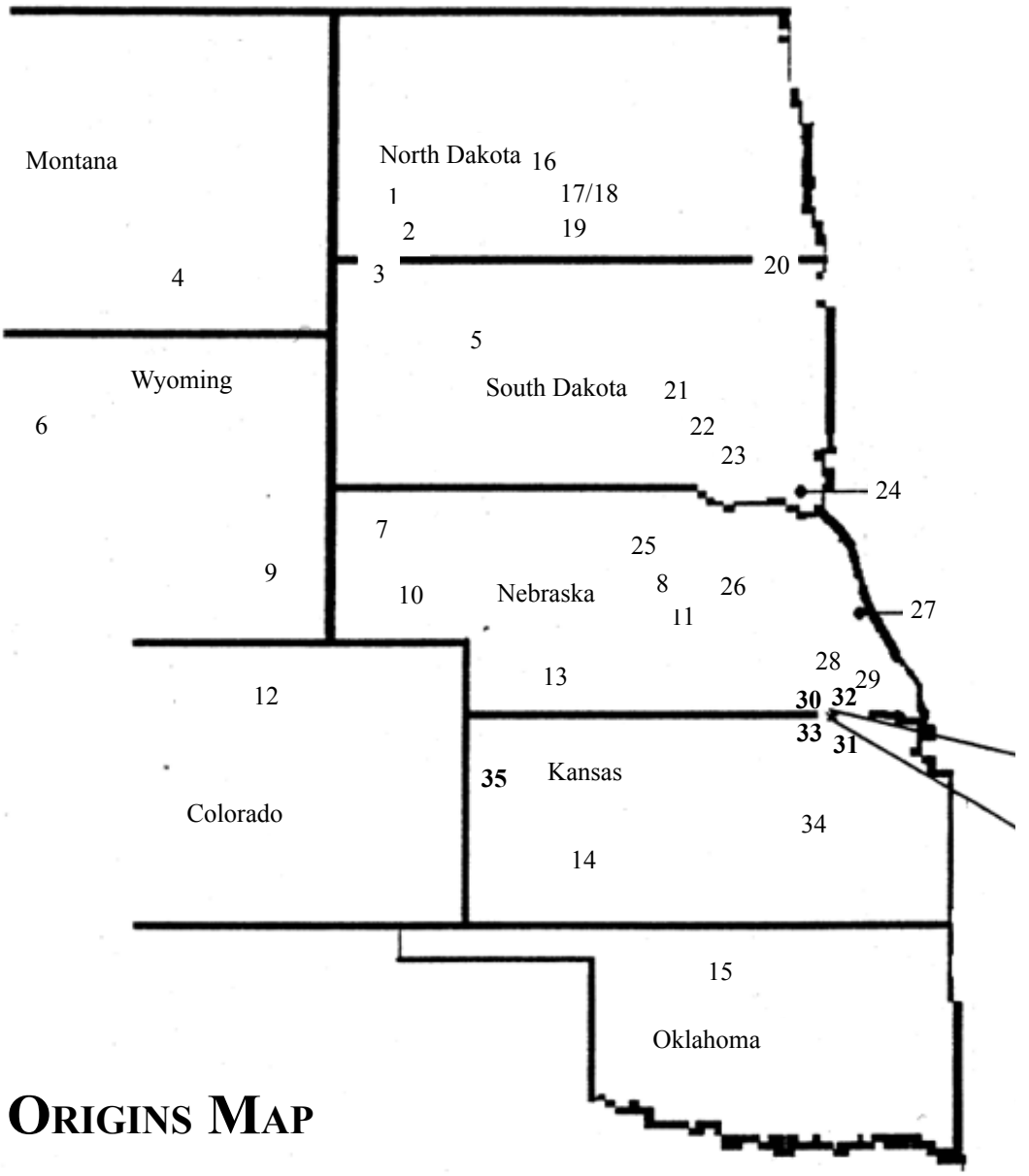
(cont. from page 21)

Timeliness: The most frequent cause of seeding failure whether dryland or irrigated, is late planting followed by hot, dry weather. Newly seeded pasture and range grasses require fifteen to thirty days for germination and emergence, depending on species, weather conditions and planting depth. From time of emergence, these seedling require about six weeks to establish an extensive enough root mass to supply the leaves with moisture during hot weather. Without sufficient root mass, the seedling cannot meet the evapo-transpiration needs of its leaves in hot weather, even if adequate soil moisture is available. To determine optimal planting time for most cool season grasses, figure back 8-10 weeks from when your temperature usually climbs into the 90's. In many areas this means March or early April for planting. Most cool season grasses germinate and thrive at fairly low temperatures so don't worry about the occasional late snow.

Lack of Quick Germination: Some seeds have a dormancy which is broken down over time in a cool, moist environment. This moist chill may require several weeks for hard seeded species like alfalfa, Indian Ricegrass and Green Needlegrass. Many seed lots of Alfalfa have relatively low dormancy and will germinated readily. Some lots may have high dormancy and would be unsuitable for mid to late spring planting. Before planting Alfalfa in the spring check with your seed vendor to make sure you're not planting alfalfa with high dormancy, say more than 10-15%. Some seeds are almost always dormant and should be planted in late fall or very early spring to allow time for moist chill.

Fertilizer: Perennial pasture grasses do not grow much in the first year and require little fertilizer until the second year. Start thinking a split application of 20 lbs Nitrogen and at least 80 lbs of Phosphorus in spring and 20 lbs of Nitrogen in the fall and then adjust for soil type and species for the first year. More fertilizer than needed will only feed annual weeds such as Kochia and Cheatgrass creating problems in the future.

1-800-967-1798



Origins Map

All of the above grasses are warm season with the exception of the Western Wheatgrass and Green Needlegrass.

Original Map provided by the USDA NRCS
Adapted by Wind River Seed
Manderson, WY 82432

www.windriverseed.com

WARM

1. Killdeer Sideoats Grama
2. Bowman Prairie Sandreed
3. Badlands Little Bluestem
4. Rosana Western Wheatgrass
5. Pierre Sideoats Grama
6. Birdseye Grama
7. Goldstrike Sand Bluestem
8. Champ Big Bluestem
9. Goshen Prairie Sandreed
10. Garden Sand Bluestem
11. Holt Indiangrass
12. Alma Blue Grama
13. Flintlock Western Wheatgrass
14. Barton Western Wheatgrass
15. Blackwell Switchgrass
16. Bison Big Bluestem
17. Lodorm Green Needle
18. Rodan Western Wheatgrass
19. Dakotah Switchgrass
20. Tomahawk Indiangrass
21. Bonilla Big Bluestem
22. Forestburg Switchgrass
23. Bad River Blue Grama
24. Sunburst Switchgrass
25. Butte Sideoats grama
26. Nebraska 28 Switchgrass
27. Roundtree big Bluestem
28. Trailway Sideoats Grama
29. Summer Switchgrass
30. Oto Indiangrass
31. Blaze Little Bluestem
32. Pawnee Big Bluestem
33. Trailblazer Switchgrass
34. Kaw Big Bluestem
35. Cimarron Little Bluestem

Buy Seed Adapted To Your Region

Wind River Seed specializes in species adapted to your location. Our seed is carefully collected from locations all over the West and cleaned to the highest standards of the seed market. Protect yourself from mechanically damaged or contaminated seed. Plant seed you know there will be no noxious weed surprises. Insist upon quality.

1-800-967-1798

GENUS	SPECIES	Common		N/I	H	FORM
Andropogon	gerardii	Big	Bluestem	N	T	S
Andropogon	hallii	Sand	Bluestem	N	T	S
Bouteloua	curtipendula	Sideoats	Grama	N	M	S-BU
Bouteloua	gracillis	Blue	Grama	N	S-M	S-BU
Buchloe	dactyloides		Buffalograss	N	S	S
Calamovilfa	longifolia	Prairie	Sandreed	N	T	S
Distichlis	stricta	Inland	Saltgrass	N	S-M	S
Hilaria	jamesii		Galleta Grass	N	S	BU-S
Leptochloa	dubia	Green	Sprangletop	N	T	BU
Muhlenbergia	wrightii	Spike	Muhly	N	S-M	BU
Panicum	virgatum		Switchgrass	N	T	S
Schizachyrium	scoparium	Little	Bluestem	N	M	BU
Sorghastrum	nutans		Indiangrass	N	T	BU
Spartina	pectinata	Prairie	Cordgrass	N	T	S
Sporobolus	airoides	Alkalai	Sacaton	N	M	BU
Sporobolus	cryptandrus	Sand	Dropseed	N	M	BU

WARM

PREC	C	MC	M	MF	F	A	N	B	RATE	S/P	PT	VARIETY
18	0	2	3	3	1	0	3	2	7	130000	SU	*Bison*
14	3	3	2	1	0	0	3	1	7-8	113000	S	*Garden, Goldstrike, Woodward*
8	1	3	3	2	0	0	3	1	3-4	191000	SU	*Butte, El Reno, Killdeer, Pierre, Vaughn*
12	1	2	3	3	2	0	3	1	2-3	825000	SU	*Bad river, Birdseye, Hachita, Lovington*
12	0	1	3	3	2	0	3	2	4-8	56000	S	*Cody, Plains, Sharp, Texoka, Topgun*
12	3	3	2	1	0	1	3	1	3-4	273000	S	*Goshen*
8	0	1	2	3	3	0	1	3	10	520000	SU	
8	0	2	2	3	3	0	3	2	6	470000	S	*Viva*
11	1	3	3	2	1	0	3	2	6	538000	S-F	
15	1	3	3	1	1	0	3	1	2	1600000	S-SU	*El Vado*
18	0	2	3	3	2	1	3	2	5-8	389000	SU	*Many*
14	2	2	3	2	0	0	3	2	3-4	260000	S-SU	*Badlands, Blaze, Camper, Cimarron, Pastura*
14	2	3	3	3	1	2	3	1	6	170000	S, F	*Holt, Tomahawk*
14-16	0	0	1	2	3	0	3	1	7	110000	S-F	*Red River*
5-13	0	2	3	3	3	0	2	3	2-3	1758000	S-F	
10	3	3	2	1	0	1	3	1	1	5298000	S-F	

Big Bluestem - *Andropogon gerardii* Tall, long lived, sod forming, perennial grass that reaches heights of 6-8' with blue-green leaves that turn redish purple in the fall; can be used as erosion control in moist, well drained soils; provides nesting habitat for birds or used as a decorative grass; *Bison(ND)*

Sand Bluestem - *Andropogon hallii* Similar to Big Bluestem but leaves are more blue-green and less reddish purple; used for erosion control, wildlife habitat and as an ornamental grass; grows up to 7' in height; often planted as a mixture with other warm season grasses; *Garden (NE, SD) Goldstrike (NE), Woodward (NM)*

Sidoats Grama - *Bouteloua curtipendula* Bunchy sod forming grass that is adapted to most well drained soil types; grows 1-3' tall with blue-green leaves that turn reddish brown when mature, spikelets grow on one side of central stalks; used in mixes for erosion control, mine reclamation and conservation work, also has good forage value; *many varieties*

Blue Grama - *Bouteloua gracilis* Very useful long-lived, drought and saline tolerant grass; performs as a bunchgrass in southern areas and a sodformer in northern higher elevation areas; short height with spikelets that curve backward into a sickle shape; used for low maintenance turf lawns, mine revegetation and grazing for livestock; *many varieties*

Buffalograss - *Buchloe dactyloides* Long lived, low growing, drought tolerant sod grass that requires very little mowing; used in parks, playgrounds, golf courses; growth begins in May-June; germinates quickly if adequate moisture is available; *Cody (NE), Plains (TX), Texoka (OK), Topgun (TX)*

Prairie Sandreed - *Calamovilfa longifolia* Found on sandy rangeland areas; tall, course, long lived, sod forming, drought tolerant, pale green grass used for stablization and grazing; may replace *Andropogon* species in extreme drought conditions; hairy, fluffy seeds require drill capable of distributing it; *Goshen (WY)*

Inland Saltgrass - *Distichlis stricta* Long lived, matt forming grass that likes subirrigated sites; excellent for erosion control in low prairies, roads and water areas; does extremely well in saline and alkaline sites where other plants won't grow; can be very aggressive and for pure stands; seed are consumed by small animals and waterfowl; *Floret*

Galleta Grass - *Hilaria jamesii* Found in dry deserts; 1-2' in height, short pale green leaves and a purple spikehead; perennial bunchgrass with some sod forming qualities; good drought tolerance; winter hardy; once established it is long lived; should not be planted in conjunction with Grama grasses; not palatable after maturing

Spike Muhly - *Muhlenbergia wrightii* Effective soil binder; tufted, perennial bunchgrass with 2-4" long black seedheads and light green leaves; found in the southwest regions; prefers slopes with sandy to silty soils; winter hardy; used for mines, construction, eroding fields and rangelands; palatable in late spring and summer; *El Vado*

Switchgrass - *Panicum virgatum* Tall, sod former; stem has a red tint and open spreading seed head; requires moisture during growth period; best in deep, heavy, acidic soils; winter hardy; used as a stabilization plant; excellent cover and feed for game birds; palatable forage until reaches maturity; will increase after intense grazing can be invasive; *many varieties*

Little Bluestem - *Schizachyrium scoparium* Tall, perennial bunchgrass with light blue-green leaves that turn rust color in fall after first frost; will grow in most soil types but does best on shallow sandy or gravelly slopes; suitable for grazing and hay but more often used in mixes for game cover, ornamental and revegetation purposes; *Badlands, Blaze, Camper*

Indiangrass - *Sorghastrum nutans* Perennial bunchgrass that grows 3-5' tall; seed head is a long brownish red plume composed of small light, fluffy seeds with small awns attached; grows well under most soil conditions; used for roadside cover, wind erosion areas, forage for wildlife and in rangeland areas; may be invasive; plant early May to June; *Cheyenne, Holt*

Prairie Cordgrass - *Spartina pectinata* Grows along streambanks, lake edges, ditches and marshes; tall sod forming perennial; poor drought tolerance; long stiff stems, sharp leaf blades, flat seeds with awns; grows best in finer textured soils; used for soil stabilization in wetland areas and wildlife nesting and cover; palatable in early growth period; *Red River*

Alkali Sacaton - *Sporobolus airoides* Long lived, tall perennial bunchgrass that grows in deep moist sand to clay soils; 2-4' tall with hairy leaves at the top; tolerance for flooding is very good; requires low maintenance once established; good forage in lowland, subirrigated, alkaline areas; matures late summer to fall; very good for erosion control

Sand Dropseed - S*porobolus cryptandrus* Mid-height, short-lived perennial bunchgrass that readily reseeds itself; finely branched panicle seed heads; adapted to dry sandy soils; small seeds that remains viable for many years; palatable forage in early growth stage; will increase under intense grazing conditions; used in mixes for rapid establishment

THE IMPORTANCE OF ORIGIN OF NAMED VARIETIES AND NATIVE HARVEST WARM-SEASON GRASSES

An understanding of the inherent variability within a species is essential in order to select varieties for seeding. The origin (the location from which the breeder originally collected seed) of native grasses is very important in determining adaptation.

The current varieties of native plants are selected ecotypes that exhibit superior performance for defined areas. The experience of the Soil Conservation Service indicates that an ecotype of a warm-season grass can be moved about 300 miles north or 200 miles south of its origin without having serious problems of winter hardiness, longevity and disease. Movement east or west is affected by changes in precipitation and elevation. Generally, an increase of 1,000 feet in elevation is equivalent to a move of 175 miles north, though one can't carry that rule too far in latitude, since the photoperiod is the same despite elevation changes.

Varieties developed from northern ecotypes are early maturing, shorter, lower in total forage production, and more susceptible to leaf and stem diseases when moved southeastward from their point of origin. Varieties developed from southern ecotypes generally are later maturing, taller, and produce higher yields of forage. These differences become more visible when moved north from the original area of collection. However, varieties moved too far north may not be winter hardy and stands may be reduced or completely lost during year of establishment or under stress conditions applied by climate or management factors.

The areas of adaptation for selected varieties follow the principles of those of native ecotypes. Therefore, it is recommended when seeding native species, use certified seed of selected varieties known to be adapted to the area. An alternative is to use seed harvested from range or native haylands.

The guidelines for native species do not apply to introduced species; however, each introduced species and/or variety has a definite, though greater, range of adaptation. It is acceptable to use locally harvested seed, but the use of Certified, blue-tagged seed is recommended to assure proper identity and genetic purity of selected varieties.

**Adapted from USDA Soil Conservation Service information. selected varieties.*

Buffalo Grass Lawns

Quick Facts

Buffalo grass lawns need less water, fertilizer and mowing than Kentucky bluegrass lawns.

Buffalo grass turf goes dormant and turns brown with extended drought and cool fall weather.

Lawns of buffalo grass, although usually started from seed, may be vegetatively planted.

Good soil and close attention to new seedlings can help get a good stand started quickly.

***Proper care will help keep buffalo grass lawns attractive through the* year.**

Buffalo grass (Buchloe dactyloides) is a permanent, native, low growing, warm season grayish-green grass. It is an important range and lawn grass. This sod-former produces vigorous runners or stolons. In the High Plains, this grass often is found growing as a companion with another native, blue grama.

Buffalo grass can sometimes serve quite satisfactorily as a lawn grass. Before choosing this grass for a lawn, its advantages and disadvantages should be considered.

Advantages

It has good drought tolerance and stands up well to wear. Irrigation, if carefully done, can be beneficial in establishing stands and in keeping an attractive and serviceable turf. Improperly done, watering can cause the buffalo grass to be overrun by other grasses and broadleaf weeds. This low growing grass requires little mowing to give it a uniform appearance. Buffalo grass has a low fertility requirement, and it often will maintain good density without supplemental fertilization.

Disadvantages

The fact that buffalo grass is a warm-season grass should not be overlooked. It turns brown with fall's first freezing weather. It greens up with the return of warm weather in the spring. Consequently, it can be golden brown (some think it is unattractive) when Kentucky bluegrass and other cool-season lawn grasses look best.

Buffalo grass, without supplemental water, will go brown and become dormant

during extended summer drought periods. This grass has poor shade tolerance, and it does not do well above 6,000 - 6,500 feet elevations. Because of rather aggressive runners, buffalo grass can require edging along walks, driveways, and shrub and flower beds.

This grass produces male plants with flowering stalks 5 -15 inches tall and female plants with burs containing 2 to 4 seeds near the soil. Variability in turf may result from differences in appearance of the male and female plants, growth height, color and density from one plant to another. Those who are accustomed to a Kentucky bluegrass turf may object to walking (particularly barefoot), playing and sitting on buffalo grass turf.

Starting a lawn

Buffalo grass will grow on heavy and compacted soils. However, it is easier to start and keep growing thick on good loam soils. When possible, if any construction is to be done, the topsoil should be saved and returned to the lawn area after construction is completed. Heavy soils may be improved by applying good quality organic matter (aged, weedfree manure or compost) 1 - 2 inches thick over the surface. This should be done before final tilling and seed preparation. Buffalo grass does not have good salt tolerance. If salt problems are common in the area, a soil test can determine potential success of a buffalo grass planting.

Before planting, the soil and soil amendments should be worked well to a depth of 4 - 6 inches. After final tilling, the soil should be leveled and firmed. Trenches for utility lines should be soaked and filled until they are level with the surrounding surface.

Buffalo grass lawns usually are started from seed. There are cultivars on the market, such as Bowie, which have been selected for good green color and thick turf.

The best time to seed buffalo grass lawns is May and June, since it will germinate only if the soil temperature exceeds 60 degrees F. At that time of year, if you keep the soil moist, buffalo grass seedlings begin to appear 6 - 10 days after planting. During warmer parts of the year, runners develop and spread is rapid. Seedings made in August or later are not recommended since they germinate slowly and grow little before cold weather.

Suggested seeding rates differ greatly. They range from as little as 1 pound up to 5 pounds per 1,000 square feet. Three pounds of a good quality, primed seed appears to be adequate for broadcast seeding in most situations. Buffalo grass seed which is treated to improve germination will be colored with a safe dye. The more seed used, the more rapid

(cont. from page 33)
the ground is covered.

Broadcast seeding followed by raking in the seed is a common practice, but the burs tend to stay on the surface. A more practical approach, using less seed, may be to plant the seed in shallow furrows, spaced 6 - 8 inches apart and cover it with 1/2 - 2/3 inches of soil. Pressing out excess air with a lawn roller will help keep the seed in contact with moist soil. A starter fertilizer usually will show little benefit on a good topsoil but can be beneficial on poor soils. An application of 5 pounds per 1,000 square feet of diammonium phosphate (18-46-0) or a commercial lawn starter fertilizer applied at the rate recommended on the bag can be used on poor soils.

For best results, a new seeding should be watered to keep the soil moist. Alter the following irrigation schedule according to precipitation. After seeding, water every day the first week, every other day the second week, every third day the third week, and once a week during weeks four and five. It is important not to let water puddle or run off the seed bed. Let the soil surface become dry before watering again, but maintain adequate subsoil moisture. This practice also helps reduce weed competition. Seedlings should start emerging in 10 - 14 days with treated seed Without supplemental watering of buffalo grass, it often takes from 5 to 10 years to get a good ground cover, so water adequately, but beware that over watering can encourage weeds.

Buffalo grass can be started by transplanting a 4 inches or larger sod piece. These plugs should be dug to a depth of 2 to 3 inches. Plugs that are transplanted in the late spring 12 to 24 inches apart, with watering and weed control, can sometimes cover the ground in one season. Buffalo grass sod is seldom laid as a solid cover. The scarcity of sod for home lawns and the need to cut the sod at least 2 inches deep limit the feasibility of marketing sod. Buffalo grass that is vegetatively transplanted needs to be well watered for several weeks.

Since buffalo grass is normally planted in late spring, new-stand weed competition can be serious. Hand-weeding and frequent mowing at 1½- 2 inches can help to keep the weeds controlled, and encourage faster buffalo grass coverage.

Maintenance

Once established, buffalo grass usually will persist without irrigation in eastern Colorado. To keep a better looking turf, and one that will provide a better surface for general use, deep watering every two weeks or so during summer dry spells can be helpful. The soil should be soaked 6 to 8

inches deep. In especially dry springs, a good watering about the time the Buffalo Grass is beginning to green can help get the grass off to a good start.

Low growing buffalo grass needs only infrequent mowing. Left unmowed it will get to a height of 4 to 5inches. But to trim off the male flowers and to get a uniform appearance, mow with a sharp blade, at a height of about one inch. This will help improve the appearance of the turf. The buffalo grass should be mowed to reduce the height of the grass by no more than 1/3 to 1/2 of its total height. That is, when the turf gets to 1½ to 2 inches it should be cut back to one inch. In late spring, mowing may need to be done every two weeks. Later in the season mowing every 3 - 4 weeks probably will be adequate.

Broadleaf weeds, such as bindweed and dandelions, can be quite objectionable in buffalo grass. This is especially true in dormant, golden brown buffalo grass turf. Used according to recommendations on the label, 2,4-D can effectively control most of the weed problems in buffalo grass lawns. Cool season grasses, such as bluegrass, tall fescue, and quackgrass, can give quite an objectionable blotchy appearance, especially in dormant buffalo grass turf. A uniform-appearing dormant buffalo grass lawn may not be objectionable; whereas, one pockmarked with green may be. A green turf colorant can be used to offset this color difference. Or chemicals such as glyphosate (Roundup and Kleen-up) can be used to spot kill objectionable grasses. Remember that herbicides used to kill grass can also kill the buffalo grass once it is green and growing, so treat weedy grasses early while the buffalo grass is dormant. Always read and follow directions on herbicide labels.

Adapted from Colorado State University Extension Service, Bulletin No. 7224, originally written by J.D Butler, CSU extension professor, turfgrass; D.A. Falkenberg, CSU graduate research assistant, horticulture

Genus	Species	Common Name		N/I	Height	Prec
Astragalus	canadensis	Canada	Milkvetch	N	12-40	20-50
Astragalus	cicer	Cicer	Milkvetch	I	28-36	18-60
Coronilla	varia		Crownvetch	I	13-24	20
Dalea	candida	Clover	White Prairie	N	12	12-20
Dalea	purpurea	Clover	Purple Prairie	N	11-35	12
Hedysarum	boreale	Sweetvetch	Northern	N	24	12-18
Lotus	corniculatus	Birdsfoot	Trefoil	I	13-24	18
Medicago	sativa		Alfalfa	I	13-25	15
Medicago	sativa	Falcata	Alfalfa	I	12-24	9-15
Melilotus	alba	White	Sweetclover	I	13-48	10
Melilotus	officinalis	Yellow	Sweetclover	I	13-60	10
Onobrychis	viciaefolia		Sainfoin	I	24-30	12-16
Trifolium	fragiferum	Strawberry	Clover	I	1-12	15
Trifolium	hybridum	Alsike	Clover	I	13-24	35
Trifolium	pratense	Red	Clover	I	18-24	32-65
Trifolium	repens	Ladino	Clover	I	12-24	35
Trifolium	repens	White Dutch	Clover	I	1-12	35
Vicia	americana	American	Vetch	N	12-24	15
Vicia	Villosa	Hairy	Vetch	I	6-24	18

A/ P or B **A**-*Annual,* **P**-*Perennial,* **B**-*Biennial*
Forms: **B** - *Bunch,* **S** - *Sod*
Soil Textures: **0** - *Lowest* **3** - *Highest*
C - *Coarse,* **MC** - *Medium Coarse,* **M** - *Medium,*
MF - *Medium Fine,* **F** - *Fine*
Soil pH: **0** - *Lowest* **3** - *Highest*
A - *Acidic,* **N** - *Neutral,* **B** - *Base*

C	MC	M	MF	F	A	N	B	RATE	SEEDS PER	PT	VARIETIES
0	1	3	2	0	2	3	1	1-2	256000	S/F	
2	3	2	1	0	3	2	1	2	145000	S/F	Lutana, Monarch
1	2	3	2	0	2	3	1	15-20	110000	S/F	
2	3	3	1	0	0	3	1	3	354000	S/F	Antelope
1	2	3	3	1	0	3	0	8	210000	S-SU	
1	2	3	2	0	1	3	1	15	33600	S	
0	2	3	3	1	2	3	1	4-6	418000	S	Empire, Leo, Norcen
1	2	3	2	0	0	3	1	8-15	210000	S/F	
1	2	3	2	0	0	3	1	12-18	210000	S/F	Many Varieties
1	2	3	3	1	1	3	2	10-15	260000	S/F	
1	2	3	3	1	1	3	2	10-15	260000	S/F	
0	2	3	2	0	1	3	1	35-45	30000	S	Eski, Remont
0	2	3	3	1	0	2	3	5-15	300000	S/F	Palestine
0	1	2	3	2	2	3	2	6-8	680000	S	
0	2	3	2	0	1	3	0	8-10	275000	S	Mammoth, Medium
0	2	3	2	1	1	3	1	2-6	800000	S/F	Titan, White
1	2	3	2	1	1	3	1	2-6	850000	S/F	
0	2	3	3	2	2	3	0	2-5	33000	S	
1	2	3	3	1	1	3	1	25-35	20000	S/F	

N/I **N**-*Native,* **I**-*Introduced*
Prec - *Precipitation Range in inches - often as the minimum requirement*
Rate - *Seeding Rate in PLS Pounds per Acre*
S/P - *Seeds per one PLS Pound*
PT - *Planting Time :*
S - *Spring,* **SU** - *Summer,* **F** - *Fall*

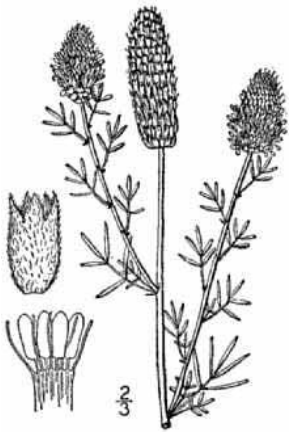
Astragalus canadensis - Canada Milkvetch
Used for erosion control, forage and restoration. Common in moist prairies, open woodlands, roadsides, thickets, and streambanks. Large robust plants with creamy greenish-white flowers about ½ to ¾" long in a dense spike-like head. Prefers moist sites, adapted to a wide range of soils and conditions. Not recommended for dry uplands. Used mainly as part of a mix. Plant ⅛ to ¼ PLS pound as part of mix. Preferred method is to use a legume box of a grass seed drill at a depth of ½ to ¾" in a firm seedbed. Longevity is three to four years. Palatable to livestock.

Astragalus cicer - Cicer Milkvetch
Introduced from Sweden. Valuable for critical area plantings, soil conservation, and wildlife habitat. Eaten by all classes of livestock either as hay or pasture. A spreading, warm season legume with large, decumbent stems. Flowers are pale yellow to white blooming in June and July. Slow to form but persistent once established. Best adapted to cool, moist sites with moderately course textured soils. Drill in fall or spring to ½ inch depth at a rate of less than 2lb PLS/acre in grass mixes.

Coronilla varia - Crownvetch
Introduced from the Mediterranean region. Spreading growth habit and strong root system make this a useful soil stabilizing plant. It produces palatable high quality forage for all livestock as hay or pasture with no bloat. It also provides good ground cover for nesting birds and smaller wildlife. Flowers are pinkish-white in long stalked clusters that bloom from spring through summer. Requires good moisture. Does not tolerate alkaline soils well but is adapts to various soil textures. Plant ½" deep 2-6 lb PLS/acre in monocultures or less than 2 lb PLS/acre in mixes. Can be very aggressive.

Dalea canadida - White Prairie Clover

Native perennial legume. Common in dry prairies and rocky uplands. Used in rangeland mixes due to high palatability and protein for livestock and wildlife. Decreases with continual grazing. Has long, white, cylindrical flowers that bloom from June through July. Can be planted in spring or fall. Requires well drained soil and prefers a sandy loam texture and full sun exposure. Use 1-2 lb PLS/acre in mixes. Also used for soil stabilization and as an attractive landscape plant. Grows to 2' at maturity.



Dalea purpurea - Purple Prairie Clover

Native warm season legume. Can be used in mixes for roadside plantings, wildlife food and habitat, wildflower gardens and prairie restoration projects. Flowers are pinkish-purple on elongated spikes. Blooms from June through August. Produces excellent forage for livestock and wildlife. It is high in protein and highly palatable. May cause bloat. Decreases with heavy grazing. Occurs in prairies and rocky terrains. Plant at ¼" depth in firm, weedfree seedbed. Seeding rate varies according to intended use. Grows well on well-drained, dry soils.

Hedysarum boreale - Northern Sweetvetch

Native, cool season perennial. Recommended for use on rangelands and upland wildlife habitats. Adapted to well drained rocky, gravelly sites from sandy to heavy clay type soils. Its deep taproot makes it winter hardy and drought resistant. Fairly competitive with natives but less aggressive than domestic grasses. Has rose-purple flowers blooms in from May to July. Seed at a depth of at least ⅛ to ¾". For mixes use ½ to 1 lb PLS/acre. Plant in late fall if possible. It greens in early spring and remains so throughout the winter. It should not be grazed during the establishment period.

Lotus corniculatus - Birdsfoot Trefoil

Cool season, long lived legume introduced from Eurasia. Used primarily for pasture and hay but has limited use for summer pastures. Clustered bright yellow flowers form in early summer and continue through the summer. Easy to establish if it has good moisture. Performs well on low fertility sites. Seed 4-8 lbs PLS/ acre for forage production. Drill at ¼" during early spring or late summer. If planting in late summer or sandy conditions increase depth to ½". Often planted with orchardgrass, timothy, meadow foxtail or tall fescue. Avoid midsummer plantings. Seedbed needs to be firm. Preparation is vital as seeds are small and grow slowly. Early weed control is important. Allow to grow to maturity every third year in order to produce a seed crop. Delay spring grazing until plants are at least 8" high.

Medicago sativa- Alfalfa

Introduced, long lived perennial. Primarily harvested in combination with grasses as hay and pasture for livestock. High in protein. Can be used for nitrogen fixation in disturbed areas. Should be grazed in short rotations leaving a two inch stubble. Can cause bloat. Blooms in a variety of colors from purple to yellow in mid to late summer. Pods are spiral and contain several small kidney shaped seeds. Grows best in deep, well drained soils. Not tolerant of high water tables. A firm, smooth, weedfree seedbed is desired. Plant late fall to early spring at a rate of 1-5 PLS lb/acre at ¼ to ¾" deep. Should be inoculated Easy to establish from seed where adequate moisture is available for germination. Many varieties available. Alfalfa is the primary honey plant in North America.

Medicago sativa spp falcata

Referred to as the yellow flowered alfalfa. Introduced from Siberia in 1915. Drought tolerant, low bloat. Used for rangeland grazing and wildlife habitat. Requires less precipitation than common alfalfas. Provides excellent coverage for game birds due to later bloom period in summer. Fibrous root system allows Falcata to compete for moisture. Also gives Falcata a higher tolerance against invasive, weedy, annual bromes such as cheatgrass. Studies have shown soil nitrogen to be dramatically increased in native grass stands with Falcata. Planting rates vary according to row spacing. This is a winter hardy alfalfa. However it has a slow regrowth and grazing needs to be managed well for Falcata to thrive.

Medicago falcata - Yellow Flowered Alfalfa

Falcata Seeding Rates

Row Spacing in feet	Seed lbs/acre
8	.3
6	.4
5	.5
4	.62
3	.82
2.5	1.0
2	1.2
1	2.5

at the rate of ½ lb/acre on 5' rows the result is 12 seeds/linear foot; divide 43,560 squared feet by row spacing in feet to get linear square feet/acre, multiply linear feet per acre by 12 seeds/ft to get seeds/acre, divide total seeds/acre by 212,000 (number of alfalfa seeds/lb) you get lbs/acre

How to Plant and Use Falcata

Plant in 4-5' row spacing by placing sweeps in front of the drill opener (disk) to produce an opening in the sod 1½" deep and 6"- 8" wide. A seeding rate of ⅓ to ½ lb PLS/acre will produce a Falcata density of 4-5 plants per square yard after several years as plants begin to spread between the seeded rows. Plants compete well with most native western grasses but may struggle against smooth brome when conditions favor the bromegrass. Falcata should not be grazed until the second year after seedling establishment.

Because of its slow regrowth, Falcata should be rested at least one month before regrazing. Well managed spring, fall and winter grazing will enable Falcata to thrive.

Besides the benefits of superior forage and yield, alfalfa in a range setting can pull livestock away from hard hit riparian areas and can reduce the need for winter feed supplements.

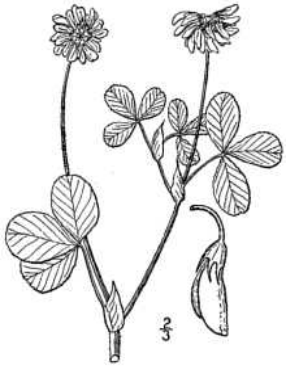
For many, the benefits of Falcata alfalfa can be outstanding. For a small investment you may get substantial benefits for hundreds of years.

Melilotus alba - White Sweetclover
Introduced, biennial legume. Found throughout the North America. Used for hay and forage but if cured improperly will create problems with cumarin. Forms small white flowers on a spike. Season of use is May through August. Easy to establish. Can withstand heavy grazing. Fair weed suppression. Nitrogen fixing. Drought tolerant. Will germinate in low fertility sites. Adapted to most soil textures. Prefers 15 to 35" moisture range. Also provides good food and cover for wildlife. Does not tolerate shade well. Drill ¼ to 1" deep at 1-5 lbs PLS/acre in mixes. Almost identical to Melilotus officinalis.

Melilotus officinalis - Yellow Sweetclover
Cool season, biennial legume introduced from Eurasia. First reported in North American in the 18th century. An excellent honey plant as it is pollinated by insects. Flowers from May into August. Easily established. Sometimes grown in pastures but should not grazed in pure stands. Used for hay and forage but can have a bitter taste which livestock must become accustomed. Can be aggressive and competitive on disturbed sites. Drill from fall to spring ¼ to 1" deep at a rate of less than 1 lb PLS/acre in mixes. Produces abundant forage for the first two years after which it will reseed itself. Nearly identical to Melilotus alba.

Onobrychis viciaefolia - Sainfoin
Introduced, cool season, perennial legume. Non-bloating. Not affected by weevil. Blooms from June to August. However, not as productive as alfalfa. Easy to establish. Adapted to deep soils with medium texture. May be slow to germinate. Less tolerant of drought than alfalfa. Can be used for grazing and/or hay. More winterhardy than most legumes. Drill ½ to 1" deep, 2 to 4 lbs PLS/acre in spring and fall. Also used for game cover and food for upland birds.

Trifolium fragiferum - Strawberry Clover
Introduced, spreading, pasture-type, perennial legume. Excellent forage for all classes of livestock and produces nutritious hay. Flowers are pink to pinkish-white blooming in the spring and summer. Well suited for irrigated and wet soils. Tolerates very salty soils and therefore, can be used for reclamation in such sites that are moist and alkaline. Very good in areas where there is poor drainage. Recommended drill rate is ¼". Less productive than White Clover.



Trifolium hybridum - Alsike Clover
A short lived perennial introduced from Europe. Good plant for meadows. Adapted to poorly drained, acidic soils in cool areas. Produces abundant foliage suited for hay or pasture under irrigation or dryland with adequate moisture. Flowers pink and white blooming from May to July, possibly longer in cool moist areas. Palatable to all livestock, especially in summer. Can cause bloat in cattle and sheep. Excessive amounts in an equine diet can create photosensitivity. In grass mixes use 4 - 6 lbs/ PLS acre, at ¼ -½" depth in a firm seedbed. Plant in spring or late fall.

Trifolium pratense - Red Clover
Introduced, biennial or short lived perennial with pubescent leaves and large rose to purple flowers. Commonly used in mixes for its ability to establish quickly. Also in short rotation crops for hay. Should be planted with longer living grasses. Nitrogen fixing. Requires well drained soils that are medium to fine textured. Requires high phosphate levels. Less drought tolerant than alfalfa. May occasionally cause bloat. Drill ¼ - ½" deep, up to 1½ lb PLS/acre in grass mixes . Protect from overgrazing and weeds in the first year of establishment.

Trifolium repens - Ladino Clover

Long lived, introduced, widely used, nitrogen fixing, perennial legume. Suited for pasture, hay and soil stabilization. Very palatable to livestock and wildlife. Often planted in conjunction with orchardgrass, ryegrass or tall fescue. Best adapted to silt and clay soils in moist or cool season irrigated pastures. Depending on soil it may need phosphate supplements. May cause bloat. Large flowering head with many white florets. Leaves are tri-fold and with a crescent mark on the upper surface. Use up to 1½ lb PLS/acre in mixes. Plant in spring or late fall. Ladino is the largest of the white clovers.

Vicia villosa - Hairy Vetch

Also referred to as Winter Vetch. Introduced, annual which sometimes acts as a biennial or even perennial. Active winter legume with shallow root system. Cold and drought hardy. Most common in sandy soils. Known for its high nitrogen fixating. If grown as hay or forage needs to be done so with a small grain support crop. Makes excellent hay but can be poisonous if in large quantities. Flowers from April to August. Seeds are small and round. Pods are elongated and flat. Because of it's climbing characteristics it is commonly planted with Rye for support. Plant 20 - 40 lb PLS/acre or 15- 20 lb PLS /acre with rye. High seeding rate per acre is due to large seed size.

Images from the USDA Plants Database
http://plants.usda.gov/gallery.html and
Common Legumes of the Great Plains - An Illustrated Guide

Alfalfa Varieties

Medicago sativa

Ladak
Ladak 65
Ranger
Spredor 4
Travois
Vernal
Wrangler

Dryland and Irrigation

Pasture Mixes

Designed to Meet Your

Specific Purposes

Why Are Legumes So Important?

Legumes such as Alfalfa, Yellow Sweet Clover, Lupine, Prairie Clover and Loco Weed all fix nitrogen in the soil. This nitrogen is available for other plants to use, and studies show that grasses planted with legumes yield more forage than grasses without legumes. Some legumes can add 50-90 pounds of nitrogen to the soil per acre, each year. Many of our rangeland soils are naturally nitrogen deficient and this can limit the growth and quality of range grasses even in wet years. Native legumes used in seed mixes fall into three categories: expensive, finicky or toxic. Consequently, Yellow Sweet Clover and Alfalfa have become the legumes of choice for seeding because of their reliability, vigor and low cost.

GENUS	SPECIES	COMMON		TR/ SH	TIME
Amelanchier	alnifolia	Serviceberry	Saskatoon	SH	SUM
Amelanchier	utahensis	Serviceberry	Utah	SH	S-SUM
Arctostaphylos	uva-ursi	Kinnikinnick	Bearberry	SH	S-SUM
Artemisia	cana	Sagebrush	Silver	SH	F
Artemisia	filifolia	Sagebrush	Sand	SH	F
Artemisia	frigida	Sagebrush	Fringed	SH	F
Artemisia	ludoviciana	Sagebrush	Prairie	SH	F
Artemisia	nova	Sagebrush	Black	SH	F
Artemisia	tridentata	Sagebrush	Basin Big	SH	F
Artemisia	tridentata	Sagebrush	Mountain Big	SH	F
Artemisia	tridentata	Sagebrush	Wyoming Big	SH	F
Atriplex	canescens	Saltbush	Fourwing	SH	SUM
Atriplex	confertifolia	Saltbush		SH	S-SUM
Atriplex	corrugata	Saltbush	Mat	SH	S
Atriplex	cuneata	Saltbush	Castle Valley	SH	S-SUM
Atriplex	gardneri	Saltbush	Gardner	SH	SUM
Atriplex	tridentata	Saltbush	Trident	SH	S-SUM
Ceanothus	sanguineus	Ceanothus	Redstem	SH	S
Ceanothus	velutinus	Ceanothus	Snowbrush	SH	SUM
Ceratoides	lanata	Winterfat		SH	S
Cercocarpus	ledifolius	Mountain Mahogany	Curl-leaf	TR	S-SUM
Cercocarpus	montanus	Mountain Mahogany	Birch-leaf or True	SH	S-SUM
Chrysothamnus	nauseosus	Rabbitbrush	Rubber	SH	F
Chrysothamnus	viscidiflorus	Rabbitbrush	Douglas	SH	SUM-F
Cornus	stolonifera	Dogwood	Redosier	SH	S-SUM
Cowania	mexicana	Cliffrose		SH	S-SUM
Ephedra	nevadensis	Mormon Tea	Nevada	SH	S
Ephedra	viridis	Mormon Tea	Green	SH	S
Fallugia	paradoxa	Apache Plume		SH	S-SUM
Grayia	spinosa	Hopsage	Spiny	SH	S
Juniperus	scopularum	Juniper	Rocky Mountain	TR	S
Kochia	prostrata	Kochia	Prostrate	SH	SUM-F
Mahonia	repens	Oregon Grape	Creeping	SH	S
Pinus	contorta	Pine	Lodgepole	TR	SUM

COLOR	Height	N/I	PREC	C	MC	M	MF	F	A	N	B	S/P
WH	36-180	N	12	0	2	3	1	0	0	3	1	25800
WH	36-144	N	10	0	2	3	1	0	0	3	1	25800
Pink	6-12	N	14	2	3	2	1	0	1	3	1	37900
	24-60	N	12	2	3	2	1	0	1	3	2	850000
	24-48	N	6	3	3	1	0	0	0	3	1	2000000
	6-18	N	8	0	2	3	2	1	1	3	1	4536000
	12-24	N	10	1	3	3	2	0	0	3	1	4500000
	6-24	N	6	0	2	3	2	1	0	3	2	907200
	36-144	N	10	0	2	3	2	0	1	3	1	2500000
	24-60	N	10	0	2	3	2	0	1	3	1	2500000
	12-36	N	8	0	3	3	1	0	0	3	1	2500000
	24-84	N	6	3	3	3	3	1	0	2	3	52000
	12-36	N	4	0	2	3	3	1	0	1	3	64900
	12	N	6	0	0	1	3	3	0	1	3	60000
	6-12	N	6	0	2	2	3	3	0	2	3	30300
	6-12	N	6	0	1	2	3	2	0	2	3	111500
	12-24	N	8	0	0	2	3	3	0	2	3	111500
WH	48-120	N	14	1	2	3	2	0	2	3	0	131900
WH	36-120	N	14	1	2	3	2	0	2	3	0	124275
	12-36	N	5	2	3	3	2	1	0	3	2	56700
Pale Y	96-360	N	8	0	2	3	2	0	0	3	1	30000
Pale Y	36-180	N	10	0	2	3	2	0	1	3	1	59000
Y	24-84	N	8	2	3	3	3	2	1	3	2	400000
Y	12-30	N	6	1	3	3	2	1	1	3	2	782000
WH	36-108	N	18	0	2	3	3	2	1	3	1	173000
Pale Y	36-240	N	10	1	3	3	2	0	0	3	1	64600
	24-60	N	5	1	2	3	2	0	0	2	3	19900
	24-48	N	7	3	3	2	1	0	0	3	2	25000
WH	36-72	N	10	1	3	2	1	0	0	3	1	420000
	24-48	N	5	1	3	3	3	1	0	3	3	166800
	180-480	N	10	0	2	3	2	0	0	3	1	27000
	12-36	I	6	1	3	3	3	1	0	3	3	407700
Y	6-18	N	14	1	3	3	1	0	1	3	1	54000
	75-150	N	18	0	2	3	1	0	1	3	0	94000

GENUS	SPECIES	COMMON		TR/ SH	PT TIME
Pinus	ponderosa	Pine	Ponderosa	TR	S-SUM
Prunus	americana	Plum	American	TR	S
Prunus	virginiana	Chokecherry		TR	S
Purshia	tridentata	Bitterbrush	Antelope	SH	S-SUM
Rhus	glabra	Sumac	Smooth	SH	S
Rhus	trilobata	Sumac	Skunkbrush	SH	S
Ribes	aureum	Currant	Golden	SH	S
Ribes	cereum	Currant	Wax	SH	S-SUM
Rosa	nutkania	Rose	Nootka	SH	SUM
Rosa	woodsii	Rose	Woods	SH	S-SUM
Sambucus	cerulea	Elderberry	Blue	SH	SUM
Sambucus	racemosa	Elderberry	Red	SH	S-SUM
Sarcobatus	vermiculatus	Greasewood	Black	SH	S-SUM
Shepherdia	argentea	Buffaloberry	Silver	SH	S-SUM
Shepherdia	canadensis	Buffaloberry	Russett	SH	S-SUM
Symphoricarpos	albus	Snowberry	Common	SH	SUM
Symphoricarpos	occidentalis	Snowberry	Western	SH	SUM
Symphoricarpos	oreophilus	Snowberry	Mountain	SH	SUM
Yucca	glauca	Yucca	Great Plains	SH	S-SUM

TR - Tree, SH - Shrub
S - Spring, SUM - Summer, F - Fall
Colors: Cream, Pink, White, Yellow

***Wind River Seed** specializes in northern cold hardy shrub seed of Sagebrush, Winterfat, Rabbitbrush and Fourwing Saltbush originating from central and northern Wyoming. Our field grown seed generally has higher purity and germination than wildland collected seed. Insect and pollination problems are minimized in a field production setting; seeds tending to be larger, more vigorous with superior shelf-life than wildland collected seed. Our field grown shrub seed is inspected by the Wyoming Crop Improvement Association and is guaranteed free of troublesome weeds.*

COLOR	Height	N/I	PREC	C	MC	M	MF	F	A	N	B	S/P
	75-150	N	12	0	3	3	2	0	2	3	1	12000
Pink	20	N	12	0	2	3	2	0	0	3	2	810
WH	5-30	N	14	1	2	3	2	0	2	3	2	4800
Y	24-180	N	8	1	3	3	2	0	1	3	1	15000
WH	48-84	N	10	1	2	3	2	0	1	3	1	49000
Y	24-72	N	8	2	3	3	1	0	0	3	1	20300
Y	36-96	N	14	0	2	3	2	0	1	3	1	356200
Pink	36-60	N	14	0	2	3	2	0	0	3	1	350000
P	24-120	N	16	0	2	3	3	1	1	3	1	45000
Pink	24-72	N	12	0	2	3	2	0	1	3	1	45300
Cream	72-240	N	12	0	2	3	2	0	1	3	1	216800
Cream	36-72	N	18	0	1	3	3	0	1	3	1	286000
	24-96	N	6	0	0	2	3	3	0	2	3	210000
Y	72-156	N	12	1	2	3	2	0	1	3	2	45000
Cream	36-144	N	12	1	3	3	1	0	1	3	1	59215
Pink	24-60	N	15	0	2	3	2	0	1	3	0	76000
WH	24-60	N	12	0	2	3	2	0	1	3	1	75000
Pink	24-60	N	12	0	2	3	2	0	1	3	1	75000
Cream	36-60	N	10	3	3	2	1	0	0	3	1	22680

N - Native, I - Introduced
Height is in approximate inches
Prec - Precipitation in minimum inches
Soil Types; C - Coarse
MC - Medium Coarse
M - Medium
MF - Medium Fine
F - Fine
Soil pH: A - Acid
N - Neutral
B - Base
S/LB - Seeds per pound

Ranges:
3 - Most Favorable
2 - Still Favorable
1 - Less Favorable
0 - No Tolerance

GENUS	SPECIES	COMMON		Height
Achillea	Millefolium	White	Yarrow	12-24
Alyssum	Maritimum	Sweet	Alyssum	8-12
Asclepias	Incarnata	Swamp	Milkweed	12-24
Asclepias	Speciosa	Showy	Milkweed	18-36
Aster	Chilensis	Pacific	Aster	12-24
Aster	Glaucodes	Blueleaf	Aster	18-24
Aster	Novae-Angliae	New England	Aster	24-68
Aster	Tanacetifolius	Prairie	Aster	18-24
Balsamorhiza	Sagittata	Arrowleaf	Balsamroot	16-30
Campanula	Carpatica		Canterbury Bells	6-12
Campanula	Rotundifolia		Harebells	4-40
Castilleja	Chromosa	Early	Indian Paintbrush	4-18
Castilleja	Exilis	Marsh	Indian Paintbrush	12-32
Castilleja	Linariaefolia	Narrowleaf	Indian Paintbrush	12-40
Castilleja	Sulphurea	Sulfur	Indian Paintbrush	6-20
Centaurea	Cyanus		Batchelor Button	8-30
Cheiranthus	Allionii		Wallflower	12-18
Chysanthemum	Maximum	Shasta	Daisy	12-36
Clarkia	Amoena		Farewell-to-Spring	6-36
Cleome	Serrulata	Rocky Mountain	Beeplant	12-48
Coreopsis	Lanceolata	Lance-Leaf	Coreopsis	18-36
Coreopsis	Tinctoria	Plains	Coreopsis	24-48
Cosmos	Bipinnatus		Cosmos	30-48
Cosmos	Sulphureus	Yellow	Cosmos	24-36
Delphimium	Ajacis	Rocket	Larkspur	12-36
Delphinium	Cardinale	Scarlet	Larkspur	24-36
Desmanthus	Illinoensis	Illinois	Bundleflower	24-40
Echinacea	Angustifolia	Black Sampson	Coneflower	12-24
Echinacea	Pallida	Pale Purple	Coneflower	18-36
Echinacea	Purpurea	Purple	Coneflower	24-36

Form	N/I	C	MC	M	MF	F	A	N	B	Rate	Seeds Per Lb	Color	Bloom
P	N	2	3	2	1	0	1	3	1	1	2770000	WH	S-F
A	I	2	3	3	1	0	0	3	1	4	1100000	WH	S
P	N	0	2	3	3	2	0	3	1	10	68100	Pink	F
P	N	0	2	3	3	2	1	3	0	6	85000	Pink	F
P	N	2	3	3	3	2	1	3	2	1	2668000	LAV	F
P	N	1	3	3	2	1	0	3	1	5	540000	WH/LAV	F
P	N	0	2	3	3	1	2	3	0	2	1216000	P	F
P	N	2	3	2	1	0	0	3	1	6	496000	P	SU
P	N	0	2	3	2	0	1	3	1	16	27000	Y	S-SU
P	I	1	2	3	2	1	1	3	1	0.5	4500000	BL/LAV	SU
P	N	1	3	2	1	0	1	3	0	0.25	1200000	B	SU-F
P	N	0	2	3	2	1	0	3	1	1	4900000	R	S-SU
A	N	0	0	2	3	2	0	2	3	1	4586000	R	SU
P	N	1	3	3	2	0	0	3	2	1	4915000	R	SU
P	N	0	1	3	2	0	1	3	0	1	4500000	Pale Y	SU-F
A	I	1	2	3	2	0	0	3	1	4	96000	B	S-SU
A	I	1	3	2	0	0	0	3	1	6	300000	O	S
P	I	1	2	3	2	1	1	3	1	6	300000	WH	SU
A	N	0	2	3	2	0	0	3	0	2	1790000	Pink, R	S-SU
A	N	0	1	3	3	2	0	3	1	9	65900	Pink/P	SU-F
P	N	2	3	3	1	0	0	3	1	10	221000	Y	SU
A	N	1	2	3	1	0	0	3	1	2	1400000	Y,Burg	SU-F
A	I	0	2	3	2	1	1	3	1	15	60000	PINK	SU-F
A	I	1	2	3	2	1	1	3	1	15	55000	OR/Y	SU-F
A	I	0	2	3	2	0	1	3	1	10	150000	WH,Pink, BL	S-SU
P	N	1	3	2	0	0	0	3	1	1.5	320000	R/OR	SU
P	N	1	2	3	2	1	1	3	1	10	85000	WH	S
P	N	1	2	3	2	1	1	3	1	12	117000	Pale P	SU
P	N	0	1	3	2	0	1	3	0	12	117000	LAV	SU
P	N	0	2	3	2	0	0	3	0	12	117000	P	S

GENUS	SPECIES	COMMON		Height
Epilobium	Angustifolium		Fireflower	14-84
Erigeron	Speciosus	Aspen	Daisy	12-24
Eriogonum	Umbellatum	Sulfur Buckwheat	Sulfur Flower	6-12
Eschscholtzia	Californica	California	Poppy	12-18
Eschscholtzia	Mexicana	Mexican Gold	Poppy	6-15
Gaillardia	Aristata	Indian	Blanketflower	18-24
Gaillardia	Pulchella		Firewheel	18-24
Geranium	Viscossimum	Wild	Geranium	12-48
Gilia	Capitata	Globe	Gilia	12-24
Gilia	Leptantha ssp Purpusii	Blue	Gillia	12-24
Gilia	Tricolor		Bird's Eye	12-28
Gypsophila	Elegans		Baby's Breath	12-18
Helianthus	Annuus	Annual	Sunflower	36-72
Helianthus	Maximiliani	Maximillian	Sunflower	36-60
Ipomopsis	Aggregata	Scarlet	Gilia	12
Iris	Missouriensis	Rocky Mountain	Iris	8-20
Kallestromia	Grandiflora	Arizona	Poppy	12-36
Layia	Platyglossa		Tidy Tips	6-12
Liatris	Punctata	Dotted	Gayfeather	12-72
Liatris	Pychostachya	Thickspike	Gayfeather	24-60
Liatrus	Spicata	Spiked	Gayfeather	12-72
Linanthus	Grandiflora	Mountain	Phlox	4-20
Linum	Grandiflorum Rubrum	Scarlet	Flax	14
Linum	Lewisii	Blue	Flax	24
Lobelia	Cardinalis		Cardinal Flower	18-48
Lupinus	Argenteus	Silver Mountain	Lupine	12-20
Lupinus	Arizonicus	Desert	Lupine	12-48
Lupinus	Perennis	Perennial	Lupine	12-24
Lupinus	Sericeus	Silky	Lupine	12-24
Mentzelia	Lindleyi		Blazing Star	12-48

Form	N/I	C	MC	M	MF	F	A	N	B	Rate	Seeds Per Lb	Color	Bloom
P	N	1	2	3	2	0	1	3	0	0.25	8500000	Pink	SU-F
P	N	1	3	3	1	0	0	3	1	2	1600000	Lavender	SU-F
P	N	2	3	3	2	0	0	3	1	10	209000	Yellow	F
A	N	2	3	2	2	0	0	3	1	8	293000	Orange	S-SU
A	N	2	3	2	2	0	0	3	1	5	850000	Y/OR	S
P	N	1	3	3	2	0	0	3	1	10	132000	Y, R	SU-F
A	N	2	3	2	1	0	0	3	1	10	153000	R,Y	SU
P	N	0	2	3	2	0	1	3	0	9	52000	Pink/LAV	SU
A	N	2	3	2	0	0	0	3	1	2	1020000	Blue	S
A	N	0	2	3	1	0	0	3	0	6	492000	Blue	S
A	N	1	3	3	1	0	0	3	1	3	1020000	Blue, OR	S-SU
A	I	1	3	3	1	0	0	3	2	10	400000	White	S
A	N	1	3	3	2	0	0	3	1	10	58500	Yellow	SU
P	N	1	2	3	3	1	0	3	0	8	225000	Yellow	SU-F
B	N	3	3	2	3	3	0	3	2		537600	Purple	SU
P	N	0	1	3	3	1	0	3	1	12	21000	Blue	S
A	N	2	3	2	0	0	0	3	1	8	93700	OR/CR	SU-F
A	N	1	3	3	1	0	0	3	1	6	350000	Y, WH	SU
P	N	0	2	3	2	1	1	3	1	12	138000	Purple	SU-F
P	N	1	3	3	1	0	0	3	1	12	128000	Rose/Pink	SU-F
P	N	0	2	3	2	1	1	3	1	12	138000	Rose/Pink	SU
A	N	2	3	3	1	0	0	3	1	2	907000	White	S-SU
A	I	1	3	3	2	0	0	3	1	15	122000	Scarlet	S
P	N	1	3	3	1	0	1	3	1	8	293000	Blue	S
P	N	0	2	3	2	0	1	3	0	0.25	8600000	Red	SU-F
P	N	1	2	3	1	0	0	3	1	25	12500	BL/LAV	SU
A	N	1	3	3	1	0	0	3	1	3	135000	BL/P	S
P	N	0	2	3	1	0	1	3	0	11	21000	P/BL	S-SU
P	N	2	3	2	1	0	0	3	1	25	12900	BL/LAV	SU
A	N	1	3	2	0	0	0	3	1	4	586000	Yellow	S-SU

GENUS	SPECIES	**COMMON**		**Height**
Monarda	Citriodora	Lemon	Mint	12-36
Monarda	Fistulosa	Wild	Bergamot	12-60
Nemophila	Maculata		Five Spot	6
Nemophila	Menziesii		Baby Blue Eyes	6-10
Oenothera	Biennis	Yellow	Evening Primrose	12-60
Oenothera	Caespitosa	Tufted	Evening Primrose	4-5
Oenothera	Hookeri	Hooker	Evening Primrose	36-48
Oenothera	Lamarckiana	Common	Evening Primrose	36-60
Oenothera	Missouriensis	Missouri	Evening Primrose	8
Oenothera	Pallida	White	Evening Primrose	8-20
Oenothera	Speciosa	Showy	Evening Primrose	10-20
Osmorhiza	Occidentalis	Sweet	Anise	16-36
Papaver	Nudicaule	Iceland	Poppy	24
Papaver	Rhoeas	Flanders	Poppy	24
Penstemon	Cyananthus	Sky blue	Penstemon	18
Penstemon	Eatonii	Firecracker	Penstemon	12-40
Penstemon	Grandiflorus	Large-Flowered	Penstemon	24-48
Penstemon	Palmeri	Palmer	Penstemon	48
Penstemon	Procerus	Small-Flowered	Penstemon	8-24
Penstemon	Strictus	Rocky Mountain	Penstemon	12-36
Phacelia	Campanularia		Bluebells	12-24
Phlox	Drummondii	Drummond	Phlox	8-20
Ratibida	Columnaris forma pulcherrima		Mexican Hat	12-24
Ratibida	Columnaris	Prairie	Coneflower	12-24
Ratibida	Pinnata	Gray-Headed	Prairie Coneflower	18-48
Rudbeckia	Amplexicaulis	Clasping	Coneflower	18-26
Rudbeckia	Hirta		Blackeyed Susan	18-48
Sanguisorba	Minor		Small Burnet	8-24
Silene	Armeria	Sweet William	Catchfly	48
Solidago	Rigida	Stiff	Goldenrod	36-60

Form	N/I	C	MC	M	MF	F	A	N	B	Rate	Seeds Per Lb	Color	Bloo
A	N	0	2	3	1	0	0	3	0	3	820000	LAV/WH	S-SU
P	N	0	2	3	2	0	1	3	0	2	1498000	Pink	SU
A	N	0	2	3	1	0	0	3	1	20	87000	WH, P	S
A	N	1	2	3	2	0	0	3	1	8	258000	Blue	S
B	N	1	3	2	0	0	0	3	1	2	1589000	Yellow	SU-F
P	N	1	2	2	3	1	0	3	1	3	900000	White	S-SU
B	N	0	2	3	2	0	1	3	1	2	1300000	Yellow	SU
A	I	1	3	3	2	0	1	3	1	2	864000	Yellow	SU
P	N	1	3	3	2	0	0	3	1	5	85700	Yellow	SU
P	N	2	3	3	1	0	0	3	1	5	512000	White	S
P	N	1	3	3	1	0	0	3	1	1	2500000	WH/Pink	S-SU
P	N	0	2	3	1	0	1	3	0	12	29800	Y/GR	SU
P	N	0	2	3	2	1	2	3	1	1	2780000	Y/OR	S
A	I	1	2	3	2	0	0	3	1	1	3200000	Red or Mix	S-SU
P	N	1	3	3	0	0	0	3	0	4	550000	Blue	SU
P	N	2	3	2	0	0	0	3	1	5	600000	Red	S-SUM
P	N	0	2	3	2	0	0	3	0	5	550000	Pink/WH	S-SU
P	N	1	3	3	2	0	0	3	1	3	610000	Lt. Pink	S-SU
P	N	0	2	3	2	0	0	3	1	3	4400000	Blue	SU
P	N	1	3	3	1	0	0	3	0	4	592000	Violet	SU
A	N	2	3	2	0	0	0	3	1	3	856000	Blue	S
A	N	0	2	3	2	1	1	3	0	10	234000	Mix	SU-F
P	N	1	2	3	2	0	0	3	1	2	1230000	Red	SU
P	N	0	2	3	2	0	0	3	1	2	1230000	Yellow	SU
P	N	0	2	3	2	0	0	3	0	6	410000	Yellow	SU-F
A	N	0	3	3	2	0	0	3	0	3	922000	Yellow	SU-F
P	N	1	3	3	2	0	1	3	1	2	1710000	Yellow	SU
P	I	1	2	3	2	0	1	3	1	20	55000	Pink	SU
A	I	0	2	3	2	0	1	3	1	1	3900000	Pink	SU-F
P	N	1	3	2	2	0	1	3	0	2	771800	Yellow	SU-F

GENUS	SPECIES	**COMMON**		**Height**
Sphaeralcea	Ambigua	Desert	Globemallow	20-38
Sphaeralcea	Coccinea	Scarlet	Globemallow	6-12
Sphaeralcea	Grossulariaefolia	Gooseberry-Leaf	Globemallow	27-38
Sphaeralcea	Munroana	Munro	Globemallow	30
Thermopsis	Mountanus		Golden Banner	12-48
Viguiera	Multiflora	Showy	Goldeneye	12-40

A - *Annual* **P** - *Perennial* **B** - *Biennial* **N** - *Native* **I** - *Introduced* **B** - *Blue* **GR** - *Green*

Penstemon *procerus*

Of all the Penstemons on the market, Penstemon procerus seems to be the easiest to establish and most broadly adapted to different soil types. Small-flower Penstemon is native to the mountains of Oregon, Idaho, Montana, Wyoming, Utah and Colorado, making it the most wide ranging of all our northwestern Penstemons. You'll find it in moist meadows, open wooded areas, dry meadows, and rocky nobs, generally between 6,500 and 12,000 feet in elevation.

Small-flower Penstemon thrives in soils ranging from clay loam to sandy loam. It does fine in disturbed soils and does not require inoculations. We've also seen excellent results in revegetation projects with Small-flower Penstemon competing successfully with aggressive species such as grasses and yarrow. Small-flower Penstemon has 4.4 million seeds per pound, so a little goes a long way! Seeding rate should range between 0.1 to 0.25 PLS pounds per acre. Despite it's small flower, it is strikingly beautiful in bloom. It is a blue-flowered forb or wildflower, over a foot tall in bloom.

We have a steady supply of the lovely Small flowered Penstemon.

	Form	N/I	C	MC	M	MF	F	A	N	B	Rate	Seeds Per Lb	Color	B.
	P	N	3	3	2	0	0	0	3	1	4	500000	OR/R	S
	P	N	2	3	3	2	0	0	3	2	4	500000	R/OR	SU
	P	N	3	3	2	1	0	0	3	1	4	500000	OR/R	S-SU
	P	N	3	3	2	1	0	0	3	1	4	500000	Orange	S
	P	N	0	2	3	1	0	1	3	1	20	15000	Yellow	S
	P	N	0	2	3	1	0	0	3	1	2	1055000	Yellow	SU

LAV - *Lavender* **OR** - *Orange* **P** - *Purple* **R** - *Red* **V** - *Violet* **WH** - *White* **Y** - *Yellow*

Penstemon *angustifolius*

Native to eastern Montana through eastern Wyoming to New Mexico, this 2 ½ ft. tall lavender Penstemon likes sandy, well drained soil, and sparing water.

Penstemon *eatonii*-
Firecracker penstemon

This bright red Penstemon is a dramatic addition to any garden or low maintenance wildflower planting. It is also useful for disturbance revegetation in dry mid-latitude areas of the West.

Penstemon *nitidus*

(projected to be available in 2008)
Short, powder blue flowered Penstemon common to the northern high plains of Wyoming and Montana.

Silver Mountain Lupine	*Lupinus alpestris/argenteus*	P-NAm
Rocky Mountain Beeplant	*Cleome serrulata*	A-WY
Purple Prairie Clover	*Dalea purpurea*	P-WY
Blanket flower G. Aristata	*Gaillardia aristata*	P-NAm
Purple Coneflower	*Echinacea purpurea*	P-NAm
Wild Geranium	*Geranium viscosissimum*	P-WY
Indian Paintbrush	*Castilleja exilis*	P-WY
Siberian Wallflower	*Cheiranthus allionii*	A-I
Blue Flax	*Linum lewisii*	P-I
Johnny-Jump-Ups	*Viola cornuta*	A/P-I
Penstemon Palmer	*Penstemon palmeri*	A-NAm
Firecracker Penstemon	*Penstemon eatonii*	P-NAm
Scarlet Flax	*Linum grandiflorum rubrum*	A-I
Rocky Mountain Penstemon	*Penstemon strictus*	P-WY
White Evening Primrose	*Oenothera pallida*	P-WY
Rocket Larkspur	*Delphinium ajacis*	A-I
Dotted Gayfeather	*Liatris punctata*	P-NAm
Globe Gilia	*Gilia capitata*	A-Nam
Aspen Daisy	*Erigeron speciosus*	P-WY
Forget-Me-Not	*Myosotis sylvatica*	A-I
New England Aster	*Aster novae-angliae*	P-WY
Prairie Aster	*M. tanacetifolia*	B-WY
Tidy Tips	*Layia platyglossa*	A-NAm
Farewell-to-Spring	*Clarkia amoena*	A-NAm
Plains Coreopsis	*Coreopsis tinctoria*	A-WY
Stillwater Prairie Coneflower	*Ratibida columnifera*	P-WY
Shasta Daisy	*Chrysanthemum maximum*	P-I
Showy Goldeneye	*Viguiera multiflora*	P-WY
Coneflower Blacksamson	*Echinacea angustifolia*	P-NAm
White Prairie Clover Antelope	*Dalea candida*	P-WY
Baby Blue Eyes	*Nemophila menziessii*	A-NAm
Black-Eyed Susan	*Rudbeckia hirta*	P-NAm
Globemallow Munro	*Sphaeralcea munroana*	P-NAm
Yarrow, White Native	*Achillea millefolium*	P-NAm
Milkweed, Butterfly	*Asclepias tuberosa*	P-NAm

Our signature wildflower mix contains perennial and biennial wildflowers, most of which are native to Wyoming, along with annual wildflowers for the first year blooms, to provide color from spring until frost. We have included approximately and equal amount of seeds for each type; since seeds are different sizes, the larger seeds represent a larger percentage by weight.

Instructions

Plant outdoors in spring or late fall in full or partial sun. Cover seed with 1/8 inch soil or rake very lightly (some seed will show). Sprinkle with a fine mist and keep evenly moist until seedlings are established, about six weeks. Soak with 1/2 inch of water every week for best results.

One pound will cover 3000 square feet.

P - Perennial
A - Annual
B - Biennial

NAm - Native to North America
WY - Native to Wyoming
I - Introduced to North America

WILDFLOWER MAINTENANCE

Your Key to Success

Maintenance is an essential ingredient in the creation of a successful wildflower planting. The key to an effective, long-term wildflower maintenance program is evaluation and timely follow-up. The site should be evaluated periodically during the growing season to determine if expectations are being met. Some conditions must be dealt with promptly while others may be corrected at a later time. Here are five areas of maintenance that require consideration:

Reseeding
Weed control
Supplemental watering
Fertilization
Fall mowing and cleanup

RESEEDING

Many people prefer the vibrant, long-lasting colors that are provided by annuals. In most parts of North America, there is just one way to create annual color year after year - by reseeding. Exceptions are Pacific Coast and the states bordering the Gulf of Mexico, where annuals readily reseed on their own.

Annuals can be reseeded in the spring or fall. Spring reseeding should be completed as soon as the ground is workable to take advantage of spring moisture. Remember that the planted area must be kept consistently moist for four to six weeks to ensure good germination. In cold climates, fall seeding should be quite late so germination does not occur until the following spring. In mild climates, planting annuals in the fall will ensure an early display in the spring. Important: follow our recommendations for appropriate planting rates because reseeding too heavily may cause crowding and poor growth.

If emphasizing perennials is your goal, inspect the planted area and roughly note the number and kinds of perennials growing there. Bare areas, if any, can be over seeded with the original planting mix or with a custom mix. Establishing a solid cover of perennials is one of the best ways to control weeds. When reseeding, some scarification of the soil surface may be necessary to ensure good seed-soil contact. A mixture of spring, summer and fall blooming perennial wildflowers will produce a changing display of color throughout the growing season.

WEED CONTROL

A monthly program of weed control is essential to ensure a satisfactory display of wildflowers year after year. Weeds should be eliminated as soon as they can be recognized, either by pulling, spot-spraying with a general herbicide, or selective cutting with a string trimmer.

SUPPLEMENTAL WATER

Water is a critical factor in wildflower maintenance. During the hot season, up to

one-half inch of moisture per week may be required to keep wildflowers at their peak.

FERTILIZATION

Fertilization may be beneficial in a long-term maintenance program, particularly if the soil is sandy or very poor in nutrients. If there is a reason to suspect a problem with soil fertility, we recommend a soil test and/or plant tissue analysis. These test will enable you to determine which specific fertilizer may be appropriated for your needs.

FALL OR SPRING MOWING AND CLEANUP

If a neat appearance is desired after the wildflowers have gone to seed, mow them to a height of four to six inches or leave them standing for winter interest and standing birdfeeders. To prepare the area for fall seeding, it may be necessary to remove any excessive plant material or mulch that could prevent good seed-soil contact.

We cannot stress too strongly the importance of a regular wildflower maintenance program, which will be dedicated by the specific goals of the project. You will be rewarded with a wildflower planting that meets or exceeds expectations and provides a beautiful display year after year.

State Flowers

CO - Rocky Mountain Columbine
Aquilegia caerulea
ID - Mock Orange
Philadelphus lewisii
MT - Bitterroot
Lewisia rediviva
ND - Wild Prairie Rose
Rosa arkansana
NE - Goldenrod
Solidago gigantea
NV - Sagebrush
Artemisia tridentata
SD - Pasque Flower
Pulsatilla hirsutissima
UT - Sego Lily
Calochortus gunnisonii

Wyoming State Flower

Wyoming Indian Paintbrush
Castilleja linariaefolia

Native,
Perennial
Red or Scarlet
Often occurs
among
Sagebrush
and Bitterbrush

SAGEBRUSH: Whenever possible select seed of northern, locally adapted ecotypes. Although some species are not site specific, the best choice is within your geographic area and elevation. Seed collected in November and germinated in December or January will have a test that will carry it through the following fall. Sage is usually tested by Tetrazolium (TZ). A good purity is 12% or better. A good TZ is 65% or better. As with all range-collected shrub seed, purity and TZ may be much lower in drought-year crops. Sow on the soil surface. As with most surface shrub seedings, late fall or early spring seeding capitalizes on snow melt to create conditions favorable for germination.

FOURWING SALTBUSH: Northern adapted ecotypes are now coming onto the market as yellow-tagged, Source- Identified seed. Expect more resistance to winterkill and greater ability to regenerate. Avoid New Mexico or Arizona ecotypes whenever possible. Expect Utah, Colorado, and Wyoming ecotypes to be more expensive and frequently unavailable. Seed stores well; 12-month tests are adequate. Usually tested by Tetrazolium, which is more indicative of viability than mere utricle fill. A good purity is 95%; a good TZ is 40%. Should be drill seeded 1/2 inch deep.

WINTERFAT: Northern adapted ecotypes not likely to be available for several years. Most seed originates in New Mexico or Arizona as Sonoran Desert transition ecotypes. Expect chronic shortages as greater demand chases available seed. “Hatch” is a selected cultivar from a Utah ecotype. Seed storage life is one to two years. Beyond September of year following collection, buyer should insist on 3 months tests. Usually tested by Tetrazolium. A good purity would be 70%; a good TZ would be 55%. Sow on soil surface.

RABBITBRUSH: Rabbitbrush seems to be more amenable to being moved than other shrub species. Any source from a neighboring state is probably adequate. Usually readily available. Often very poor storage life with significant loss of viability possible at any time and with high likelihood of serious viability loss within one year of collection. Purity as high as 50% but usually about 20%. A good TZ would be 65% or better. Broadcast on the soil surface.

GREASEWOOD: Ecotype sensitivity poorly understood. Select nearest origin when possible. Shelf-life one to two years. Purity 40% to 60% to be expected. TZ above 40% acceptable. May be drill seeded to a shallow depth.

Western Wheatgrass

Agropyron smithii (old)
Pascopyrum smithii (new)
Elected by the 2007 Legislation
as the official state grass of Wyoming.

Other state grasses
in surrounding areas include:

CO- Blue Grama
Bouteloua gracilis
MT - Bluebunch Wheatgrass
Agropyron spicatum
ND - Western Wheatgrass
Agropyron smithii
NE - Little Bluestem
Schizachyrium scoparium
NV - Indian Ricegrass
Oryzopsis hymenoides
SD - Western Wheatgrass
Agropyron smithii
UT - Indian Ricegrass
Oryzopsis hymenoides

Seeding Depth.
Soil texture should be considered in determining proper seeding depth. Heavy, clay soils should generally be planted more shallow than sandy soils. Since sandy soils tend to lose moisture quickly we usually plant on the deep side of our target range. Planting too shallow may put the seed in a zone where moisture evaporates quickly, robbing the seed of that 2-3 weeks of moisture necessary for germination. Generally, the larger the seed the deeper you can plant it; a commonly used rule of thumb is to plant seed to a depth 2½ times the diameter of the seed.

In general Wind River Seed's mixes can be safely planted at 1/4 - 1/2 inches deep.

Genus	Species	Common Name	Comments/ Descriptions
Agrostis	scabra	Ticklegrass	N, P, C, B, 10-20”
Asclepias	incarnata	Swamp Milkweed	N, P, F, 5’
Astragalus	canadensis	Canada Milkvetch	N, P, F, 2-3’
Aster	novae-angliae	New England Aster	N, P, F, 2’-6’
Beckmannia	syzigachne	American Sloughgrass	N, A, 36”
Calamagrostis	canadensis	Blue Joint Reedgrass	N, P, C, R, 48”
Carex	aquatilis	Water Sedge	N, P, C, 30”
Carex	crinita	Fringed Sedge	N, P, G, 5’
Carex	hoodii	Hoods Sedge	N, P, G, 6’-16’
Carex	hystericina	Porcupine Sedge	N, P, R, 19”-59”
Carex	microptera	Small Winged Sedge	N, P, C, 20”
Carex	nebrascensis	Nebraska Sedge	N, P, C, 4’
Carex	praegracilis	Black Creeper Sedge	N, P, C, 24”
Carex	rostrata	Beaked Sedge	N, P, C, 36”
Carex	stipata	Sawbeak Sedge	N, P, B, 3’
Cornus	stolonifera	Redosier Dogwood	N, SH, 15’
Deschampsia	caespitosa	Tufted Hairgrass	N, P, C, B, 30”
Distichlis	spicata	Inland Saltgrass	N, W, S, 6”
Eleocharis	palustris	Creeping Spike Rush	N, P, 3’
Eupatorium	maculatum	Joe Pye Weed	N, P, F/SH
Glyceria	grandis	American Mannagrass	N, P, R, 4’
Glyceria	striata	Fowl Mannagrass	N, P, R, 3’
Iris	missouriensis	Rocky Mountain Iris	N, P, F, 12”
Juncus	balticus	Baltic Rush	N, P, S, 24”
Juncus	effusus	Soft Rush	N, P, G, 6’

Genus	Species	**Common Name**	**Comments/ Descriptions**
Juncus	ensifolius	Daggerleaf Rush	N, P, G, 2’
Juncus	torreyi	Torrey Rush	N, P, G, 3’
Poa	palustris	Fowl Bluegrass	N, P, G, 4’
Scirpus	acutus	Hardstem Bulrush	N, P, C, R, 6’
Scirpus	atrovirens	Dark-Green Bulrush	N, P, G, 6’
Scirpus	maritimus	Alkalai Bulrush	N, P, G, 3’
Scirpus	pungens	Three Square Bulrush	N, P, G, 5’
Scirpus	validus	Softstem Bulrush	N, P, G, 9’
Spartina	pectinata	Prairie Cordgrass	N, P, W, S, 5’
Thermopsis	montana	Golden Banner	N, P, L, F, 24”
Verbena	hastata	Blue Vervain	N, P, F, 24”
Vernonia	fasciculata	Ironweed	N, P, F

Legend: N-native, I-introduced
A - Annual, P - Perennial,
C - Cool Season, W - Warm Season
B - Bunch, S - Sod, R - Rhizomatous
F - Forb, G - Grass, L - Legume, SH - Shrub
Height in inches and/or feet

1-800-967-1798

Nomenclature Changes for Some Common Grasses

OLD	NEW
Agropyron dasystachyum	*Elymus lanceolatus*
Agropyron elongatum	*Thinopyrum ponticum*
Agropyron intermedium	*Thinopyrum intermedium*
Agropyron riparium	*Elymus lanceolatus*
Agropyron smithii	*Pascopyrum smithii*
Agropyron spicatum	*Pseudoroegneria spicata*
Agropyron trachycaulum	*Elymus trachycaulus*
Agropyron trichophorum	*Elytrigia intermedia*
Agrostis alba	*Agrostis gigantea*
Agrostis tenius	*Agrostis capillaris*
Elymus cinereus	*Leymus cinereus*
Elymus giganteus	*Leymus racemosus*
Elymus junceus	*Psathyrostachys juncea*
Elymus triticoides	*Leymus triticoides*
Festuca scabrella	*Festuca campestris*
Hilaria jamesii	*Pleuraphis jamesii*
Lolium multiflorum	*Lolium perenne*
Oryzopsis hymenoides	*Achnaterum hymenoides*
Poa ampla	*Poa secunda*
Sitanion hystrix	*Elymus elymoides*
Stipa viridula	*Nassella viridula*

COMMON

Thickspike Wheatgrass
Tall Wheatgrass
Intermediate Wheatgrass
Streambank Wheatgrass
Western Wheatgrass
Bluebunch Wheatgrass
Slender Wheatgrass
Pubescent Wheatgrass
Redtop Bentgrass
Colonial Bentgrass
Basin Wildrye
Mammoth Wildrye
Russian Wildrye
Beardless Wildrye
Rough Fescue
Galleta Grass
Annual Ryegrass
Indian Ricegrass
Big Bluegrass
Bottlebrush Squirreltail
Green Needlegrass

Soil Preparation

Ideal soil is firm and somewhat rough with small clods. You should be able to leave the print of your heal only 1/4 inch deep. If you sink up to your ankle in dust your equipment will almost surely plant the seed too deep. Not only will the seed be too deep in fluff but such soil is very poor in its ability to support the capillary action between soil particles necessary to wick moisture to the seed. Small clods help preserve soil moisture and reduce soil erosion, so take care not to over prepare your seed bed.

CERTIFIED SEED DOESN'T COST ... IT PAYS

There is some confusion about the use of the word "certified" in seed planting specifications. Often the engineer merely wants the seed supplier to certify that the seed has been tested at an official laboratory and that the seed in the bag conforms to the information on the bag tag.

In the seed industry, there is another meaning to the word "Certified." Each state has a Seed Certifying Agency (or Crop Improvement Association) which writes the rules for seed produced in its state. Seed Certification is the means of maintaining the pedigree of a specific variety of seed (such as the named variety 'Goldar," which is a variety of bluebunch wheatgrass). Seed growers voluntarily use seed certification to assure their customers that extra care has been taken to provide them with correctly identified, genetically pure seed.

The blue Certified seed label identifies seed meeting Certification requirements and thereby assures the seeder of obtaining varietal performance of the variety named on the label. Each variety is released for propagation because it is deemed superior in one or more characteristics, such as seedling vigor, low dormancy, broad range of adaptability, seed production, form and color, or palatability.

Each grower is responsible for handling their certifiable seed so that it will also meet the Seed Certifying Agency standards for mechanical purity and germination. Each state law requires that each container of seed be labeled as to its origin; the germination percentage and date of germ test; the percentage by weight of pure seed, other crop seed, weed seed, inert matter; and number and kind of restricted noxious weeds. This label is commonly referred to as an analysis tag. By studying both the Certified and the analysis tags, one can determine the quality of the seed in the container. Blue-tagged Certified seed must meet high purity and germination standards, and have a low weed content (usually less than 0.25%); whereas there are no standards for noncertified seed other than state limits on the weeds (often as high as 2.00%).

In addition to Breeder and Foundation seed, which are sold to growers only, three other classes of certified seed are recognized:

Registered *seed is the progeny of Foundation seed and meets the high field inspection and laboratory requirements for this class. Bagged seed should have a* ***purple*** *tag. Registered seed is more expensive, and is usually sold to growers.*
Certified *seed is the progeny of Registered seed. Bagged seed should have a* ***blue*** *tag.*

Certified seed is affordable, high quality seed sold for planting by the end user, such as for revegetation.

Source-identified *seed is collected from natural stands or seed production areas where no selection or testing of the parent population has been made. In this case, the inspector travels to the collection site to verify the species; county, state, and elevation; the dearth of noxious weeds; and an estimate of pounds collected. A* ***yellow*** *Source-Identified tag assures the buyer that his fourwing saltbush was, for example, collected in Wyoming rather than New Mexico, and will be cold hardy.*

Even though a bag may not have a purple, blue, or yellow tag, it may still contain the variety claimed. A seed lot may fail to be Certified merely because the mechanical purity proves to be slightly lower than the standard for that variety. Or, since Certified seed often does not command a much higher price than common seed, a grower may not go to the trouble and expense of having his field and cleaning plant inspected by the Seed Certifying Agency. (In Wyoming, for example, a grower pays $4.00 per acre for inspection.) The variety cannot be verified by visual inspection at the seed lab. The integrity of the grower and the seed dealer determine whether the seed is truly the variety claimed on the label. Non-certified seed may come from an old pasture that the rancher recalls his dad planting with such-and-such variety.

Freedom from worry over noxious weeds is another benefit of field inspection. Common or non-certified fields are not walked by the inspector, and a "clear tag" laboratory test will be based on only 25,000 seeds (about 60 grams.) A noxious weed missed in the first sample may show up in subsequent samples (if they are taken), often after the seed is in the ground and a costly spray eradication program is the only course remaining. Field inspection greatly reduces the chances of overlooked noxious weed seeds being harvested.

Many seeders already have found that quality seed pays in better establishment and permanence. This trend protects reputable seed companies and encourages growers to produce enough high quality seed to meet the demand.

If you would like to make sure to get quality seed, specify: "Certified, blue-tagged seed shall be supplied where a named variety is specified. Vendor shall indicate on the bid whether Certified or common seed is being offered, as well as the origin of the seed. The blue tags which are removed to mix the seed shall be given to the reclamation engineer; in addition, mix tags showing the weighted averages of the ingredients shall be attached to each bag."

Cover Crops

Scientific name	Common name	Seeds/pound
Avena sativa	Oats	19,400
Echinochloa esculenta	Japanese Millet	220
Hordeum vulgare	Barley	13,500
Panicum frumentacea	German Millet	220,000
Panicum miliaceum	White Millet	80,000
Secale cereale	Cereal Rye	18,000
Setaria italica	Foxtail Millet	220,000
Triticum aestivum x Elytrigia elongata	Regreen®	11000
Triticum aestivum	Wheat	15,000
Sorghum sudanese	Sudangrass	44,000
Sorghum vulgare	Sorghum	15,000
Triticum aestivum x Secale cereale	Triticale Quick Guard®	18,000

Weeds To Avoid In Wyoming

Prohibited

Bindweed, Field
Burdock, common
Bursage, skeletonleaf
Cress, hoary
Daisy, oxeye
Houndstongue
Knapweed, Russian
Pepperweed, perennial
Quackgrass
Sowthistle, perennial
Spurge, leafy
Thistle, Canada
Thistle, musk
Thistle, plumeless
Thistle, Scotch
Toadflax, Dalmation
Toadflax, yellow
Woad, dyers

Restricted

Dock, curly
Lettuce, blue
Licorice, wild
Oats, wild
Plantain, buckhorn
Poverty weed
Puncturevine
Ragweed, perennial
Star-thistle, yellow
Swainsonpea
Tansy
Tansymustard

For further information and assistance in identifying and controlling weeds in your area contact your county weed and pest agent.

1-800-967-1798

RETAIL ORDER FORM

Fill out and return to our office and we will ship your order right away.
Or call 1-800-967-1798

Wind River Seed Wildflower Mix - A combination of annual and perennial forbs

PACKAGE SIZE	COVERAGE (sq.ft.)	PRICE	X	QUANTITY	= TOTAL
1 pound	3,000	$50		_____	_____
8 ounces	1,500	$26		_____	_____
4 ounces	750	$14		_____	_____
2 ounces	375	$8		_____	_____
1 ounce	187	$5		_____	_____

Listed below are just a few of the many native grasses we offer.

	PRICE	X QTY	= TOTAL
Sodar Streambank, cool season, drought tolerant turf	$9.00	_____	_____
Blue Grama, warm season, drought tolerant turf	$8.00	_____	_____
Buffalograss,low growing, warm season, turf	$14.00	_____	_____
Thickspike Wheatgrass, sod-forming grass for sandy soil	$10.00	_____	_____
Western Wheatgrass, bluish sod-forming grass, heavy soil	$8.00	_____	_____
Side-oats Grama, decorative bunchgrass	$10.00	_____	_____
Little Bluestem, bunchgrass, red accent in fall	$12.00	_____	_____
Indian Ricegrass, decorative bunchgrass	$18.00	_____	_____
Sheep Fescue, Covar for drought tolerant lawns	$8.00	_____	_____
Green Needlegrass, bunchgrass	$5.00	_____	_____
Drought-tolerant, decorative grass mix	$16.00	_____	_____
Mountain mix: native grasses & 4 wildflowers	$16.00	_____	_____

Shipping and Handling Charges:

1 to 5 pounds	$10.00
6 to 10 pounds	$15.00
11 to 15 pounds	$25.00

TOTAL =
Local Sales Tax +_____
(WY residents only)
SUBTOTAL = _____
S/H +
TOTAL DUE =_____

We accept all major credit cards and checks.
Wyoming residents, please add your local sales tax to the seed only.
Minimum order is $50.00.
E-mail: wrsales@windriverseed.com
Website: www.windriverseed.com