

PLANT MATERIALS TECHNICAL NOTE

SLENDER WHEATGRASS *Elymus trachycaulus*: A Native Grass for Conservation Use in Montana and Wyoming

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Figure 1. Slender wheatgrass seedheads.

General Description

Slender wheatgrass is a cool-season, native, perennial grass. It grows two to three feet tall from dense, fibrous, and relatively shallow (18 inches) roots. Slender wheatgrass establishes as a bunch-type plant with numerous leafy tillers, and is short-lived (three to five years). The dark green leaves are rough to the touch, sometimes smooth beneath, and edged with narrow, white bands. Distinguishing characteristics from other wheatgrasses are leaves and stems tinged reddish-purple at the base, distinctly veined leaf sheath, prominent and strongly nerved glumes, and a narrow, slender seedhead.

Adaptation or Range

Slender wheatgrass is adapted to a wide range of soil types and is most commonly found on loamy clay soils in areas receiving a minimum of 10 inches annual precipitation at elevations of 3,500 to 10,000 feet. It is predominantly found in the semi-arid portions of the Intermountain West and Northern Great Plains regions. Slender wheatgrass inhabits moist to well-drained soils along rivers and meadows, as well as under open forest canopy. It is capable of withstanding periodic flooding and extended drought.

In Montana, slender wheatgrass inhabits many riparian and wetland sites, including six coniferous forest, 12 deciduous forest, 26 willow and non-willow shrub, and 10 sedge and non-sedge community types. Slender wheatgrass is an integral component of five grassland and shrubland habitat types of western Montana. It is considered a climax species on more than 10 ecological sites in several Major Land Resource Areas (MLRAs). Slender wheatgrass is a co-dominant grass

in three rangeland cover types in the mountainous region of southwest Montana. It is known to inhabit at least 49 of 56 Montana counties.

In Wyoming, slender wheatgrass is widely adapted across the seven geographic regions and is scattered throughout the 15 MLRAs. It is present on 74 ecological sites and a co-dominant grass on 29 of those sites in MLRAs 32, 34A, 43B, 47 UT, 58B, 61 and 67A. Slender wheatgrass is known to inhabit all 24 Wyoming counties.

Conservation Uses

Slender wheatgrass was among the first native grasses used to revegetate large-scale disturbances. It is ideal for use in mixtures for conservation and reclamation plantings. In a native seed mixture, slender wheatgrass should not constitute more than 20 percent of the composition in the mix because of its rapid establishment and competitive nature. It is moderately to strongly tolerant to saline soils with electrical conductivity of 15 to 25 millimhos per centimeter (mmhos/cm).

Slender wheatgrass is used in short rotation for hay or pasture and makes good hay for two to three years before drastically declining in stand and production. Irrigated yields range from 2,000 to 8,000 pounds per acre, whereas dryland yields may be half or less. It is palatable when grazed or harvested at the boot to early-heading stage and has high feed value in spring and early summer for all classes of livestock.

The foliage is a good source of food year round for deer, elk, bighorn sheep, and antelope. Seeds are eaten in the fall and winter by rabbits, squirrels, mice, gophers, and a variety of waterfowl, songbirds, and upland game birds such as sage-grouse, sharp-tailed grouse, and Hungarian partridge. Slender wheatgrass provides good wildlife cover due to its upright structure and standing residue.

Slender wheatgrass is a common component in post-fire seeding treatments. Its rapid germination, strong seedling vigor, and moderate longevity provide a high degree of erosion control during the establishment of slower developing, long-lived perennials.



Figure 2. Slender wheatgrass in early summer.

Ease of Establishment

Slender wheatgrass is easily established from seed due to a high germination rate, rapid emergence, and excellent seedling vigor. It provides quick initial cover and stabilization when seeded on disturbed sites. The number of seeds per pound ranges from 97,000 to 147,000.

Planting Rates [all recommended amounts based on pure live seed (PLS)]:

As a guideline, at a seeding rate of 1 pound per acre, there are approximately 2.8 seeds per square foot. A full seeding rate is based on 25 seeds per row-foot. For example a full seeding rate in 24-inch wide rows is 3.9 pounds per acre.

Stand Establishment

For best results seed should be planted into a firm, weed-free seedbed. When drill-seeded in a pure stand in 6- or 12-inch row spacing, the rate is 6 pounds per acre – a broadcast seeding rate is double the drill rate. If planted in a mixture, adjust the seeding rate to the desired percentage in the mix, in general, 1 to 2 pounds per acre. A seeding depth of ¼- to ½-inch is recommended. Planting can be done either in the spring or late fall as a dormant seeding. Slender wheatgrass is short-lived and established stands are susceptible to over-grazing.

Slender wheatgrass has been tested in field planting trials across Montana and Wyoming since the late 1970s. In almost all instances where weed infestation was severe to moderate due to inadequate seedbed preparation, the grass seedlings could not compete and the stands failed.

Seed of slender wheatgrass is relatively easy to produce. Seed fields should be established in 22- to 30-inch spaced rows and cultivated to maintain the rows. Irrigated seed production yields 600 to 900 pounds per acre for three years. Seed grown under dryland conditions requires at least 16 inches of annual precipitation with yields approximately one-half of irrigated production. Seed fields can be either swathed or direct-combined when seed is in the early firm dough stage or at the first sign of any shatter from the tip of the seedhead. Seed combined out of cured windrows has suitable moisture content for storage, whereas direct combined seed does require drying prior to storage. Direct cutting of Pryor results in less seed shatter loss, but there will be more immature seeds harvested. The average harvest date at the Bridger Plant Materials Center (PMC) is July 15.



Figure 3. Harvesting seed of Pryor slender wheatgrass.

Limitations

Plant taxonomists have identified several regional ecotypes of slender wheatgrass so it is important to consider using an adapted source. Wildfire affects slender wheatgrass in the spring during its active growing period, while moderately-severe summer and fall fires will top-kill plants and some tillers. It is slightly susceptible to head smut *Ustilago bullata* and stripe smut *Ustilago striiformis*, and may be susceptible to infestations of grass billbug *Sphenophorus* spp. It does not tolerate heavy shade, waterlogged soil, or heavy, continuous grazing. Slender wheatgrass is not considered weedy, but may persist due to abundant self-seeding. Slender wheatgrass is self-pollinated with a chromosome number of $2n=28$.

Releases

'Primar' originates from a 1933 collection made in Montana; it was cooperatively released from the Washington PMC; Washington, Idaho, and Oregon Agricultural Experiment Stations (AES); and the Agricultural Research Service (ARS) in 1946, primarily for use as a green manure crop. 'Revenue', Elbee, and 'Adanac' were released by Agriculture Canada in 1970, 1980, and 1990 (respectively) for use in Alberta and/or Saskatchewan. 'San Luis' originates from Rio Grande County, Colorado; it was cooperatively released from the Colorado PMC, Colorado and Utah AES, and the ARS in 1984, primarily to stabilize disturbed, high elevation sites receiving greater than 14 inches annual precipitation. 'Pryor' originates from a 1975 collection made in Carbon County, Montana; it was cooperatively released from the Bridger PMC and the Montana and Wyoming AES in 1988, for excellent seedling vigor and high tolerance to drought and saline conditions. Copperhead Germplasm originates from a 1998 collection made in Deer Lodge County, Montana; it was cooperatively released from the Bridger PMC and the Montana and Wyoming AES in 2006, for its high tolerance of acid and heavy-metal impacted soils. 'FirstStrike' is a multi-origin composite of three collections from Colorado and Wyoming; it was cooperatively released from the Utah ARS and the U.S. Army in 2006, for persistence and overall plant vigor in response to drought.

Additional Information

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Slender Wheatgrass Plant Fact Sheet and Plant Guide available at <http://plants.usda.gov>