

PLANT MATERIALS TECHNICAL NOTE

PRAIRIE SANDREED *Calamovilfa longifolia*: A Native Grass for Conservation Use in Montana and Wyoming

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Figure 1. Prairie sandreed.

General Description

Prairie sandreed is a tall, sod-forming, warm-season, native grass. Once established, it is an erect grass with vigorous creeping rhizomes and an extensive fibrous root system. Prairie sandreed has rigid, leafy stems that are 2 to 6 feet high. The predominately basal leaves are pale green to straw colored, coarse, mostly flat, up to ½-inch wide and 15 to 24 inches long, tapering to a fine point. The leaf collar lacks auricles, and is hairy inside with a short bristly ligule. The inflorescence is a narrow to semi-open panicle, 6 to 14 inches long. The shiny spikelet is 1-flowered and the floret has a basal ring of white hairs half the length of the lemma.

Adaptation or Range

Prairie sandreed ranges from Michigan to Alberta, south to Indiana, Colorado, and Idaho. It is typically found growing on coarse- to medium-textured soils on Overflow, Silty, Shallow, and Limey Ecological Sites receiving 10 to 20 inches of annual precipitation. Prairie sandreed grows in weakly acidic to moderately alkaline soils (pH 6.1 to 8.4) and is slightly tolerant of saline (non-sodic) soils with electrical conductivity of 4 to <8 millimhos per centimeter (mmhos/cm). It is strongly resistant to drought and will replace bluestem grasses (*Andropogon* and *Scoparium* species) during extended periods of dry weather. Prairie sandreed is intolerant of high water tables and early spring flooding. It is intolerant of shade at all stages of growth. Prairie sandreed is very cold tolerant but southern or low elevation types are not winter hardy when seeded in northern latitudes.

In Montana, prairie sandreed is found almost exclusively on thin to moderately-deep sandy or gravelly rangelands. It is present on 35 ecological sites and is a co-dominant grass on more than 14 of those sites in Major Land Resource Areas (MLRAs) 43, 44, 46, 52, 53A, 58A, and 60B. Prairie sandreed is especially adapted to sites in eastern Montana at elevations of 2,000 to 5,000 feet. It is known to inhabit at least 42 of 56 Montana counties.

In Wyoming, prairie sandreed occurs from lowlands to uplands on gravels, sand plains, thin hills, and sand dune areas at elevations of 2,500 to 7,500 feet. It is present on 48 ecological sites in MLRAs 32, 34A, 43B, 46, 58B, 60A, 61A, 64, and 67A. Prairie sandreed is known to inhabit at least 17 of 24 Wyoming counties.

Conservation Uses

Prairie sandreed is primarily used in mixtures to stabilize sandy sites on rangeland and roadsides. The sod-forming roots form dense colonies that effectively bind the soil and control soil erosion from wind and water. Prairie sandreed is readily grazed by livestock early in the spring and later in the fall and is considered to be good winter forage. The new growth in the spring is palatable, but is avoided in mid-summer if more desirable warm-season grasses are available. Poor stands are improved by winter grazing or rotational grazing. Prairie sandreed decreases under grazing pressure from cattle, horse and bison, and increases in response to sheep grazing. In the northern and central Great Plains, it is secondary spring forage for deer and antelope. In the foothill and mountain regions, it is primary spring and summer forage for elk. Prairie sandreed is not suitable as a hay crop due to poor forage quality in summer. It provides excellent cover for wildlife and the seed is eaten by song birds and rodents.



Figure 2. Mature stand of prairie sandreed.

Ease of Establishment

Prairie sandreed is moderately difficult to establish from seed. Individual seeds are fluffy and planting with a specially-equipped grass drill is required to maintain a constant flow of material. Seedling vigor is lower than other native grasses requiring three years or longer before reaching full maturity. The number of pure-live-seeds (PLS) per pound range from 233,000 to 273,000.

Planting Rates (all recommended amounts based on PLS)

As a guideline, at a seeding rate of 1 pound per acre, there are approximately 5.8 seeds per square foot. A full seeding rate is based on 25 seeds per linear or square foot. For example a full seeding rate in 24-inch wide rows is 2 pounds per acre.

Stand Establishment

For best results seed should be planted into a firm, weed-free seedbed. When drill-seeded at 6- or 12-inch row spacing, the full rate is 4 pounds per acre. The broadcast seeding rate is double the recommended drill rate. When drill-seeded, it is recommended to plant prairie sandreed with 18 inches between rows (2.7 pounds per acre for a full stand) to reduce intraspecific competition during establishment. Once established, it is very competitive due to the spreading rhizomes. If planted in a mixture, adjust the seeding rate to the desired percentage in the mix, in general, $\frac{1}{4}$ to $\frac{1}{2}$ pound per acre. Seed should be planted in the spring after the last killing frost to a depth of 1 inch in sandy soils and $\frac{1}{2}$ inch in medium-textured soils. Prairie sandreed can be planted by seed-hay or sprigging methods to improve stand establishment on sand dunes and erosive sites; e.g., in “blowouts.” Prairie sandreed is tolerant of wildfire when dormant and re-establishes quickly after burning. Prescribed fire is used to reduce fuel hazards and rejuvenate stands by eliminating dead material that could negatively impact new growth in the springtime.



Figure 3. Prescribed fire as a management tool in prairie sandreed.

Prairie sandreed has been field tested in dryland trials across Montana and Wyoming since the mid-1960s. In Montana, prairie sandreed performed “very well” in 22 trials on the sites with sandy to silty loam soils and performed “satisfactorily” on the sites with loam to clay loam soils. Failures occurred where annual precipitation during the establishment year was well below normal or when drought conditions prevailed for several years.

In Wyoming, prairie sandreed performed “very well” in 11 trials on sandy to sandy loam sites. Failures occurred where annual precipitation during the establishment year was well below normal, where weed infestation was “severe”, and when livestock overgrazed the test plots.

Seed of prairie sandreed is moderately easy to produce under cultivated conditions. Seed fields should be established at 25 to 30 seeds per linear foot. When planted in rows two feet apart, the recommended seeding rate is 2 to 2.4 pounds per acre. When planted in rows three feet apart, the recommended seeding rate is 1.3 to 1.6 pounds per acre. Individual rows may be maintained with cultivation. Once rhizomes begin to develop, the rows may be allowed to spread to a solid stand,

although the result will be lower seed yields. Irrigated seed production with 80 pounds of actual nitrogen per acre applied in the fall yields an average of 163 PLS pounds per acre for five to seven years. Prairie sandreed processing is difficult due to late maturity, seed shattering, lodging, and a high volume of fluffy material. Seed fields are direct combined when seed is in the hard dough stage. If direct combined, the seed must be dried prior to storage. The average harvest date at the Bridger Plant Materials Center (PMC) is October 1. Prairie sandreed is wind pollinated with a chromosome number of $2n=40$.



Figure 4. Goshen prairie sandreed seed production field at the Bridger PMC.

Limitations

Prairie sandreed has a low tolerance to close, continuous grazing and can be displaced by blue grama *Bouteloua gracilis*, buffalograss *Bouteloua dactyloides*, and other shortgrass prairie species. Despite heavy root development, this grass is susceptible to trampling and will disappear from sites where livestock congregate. Prairie sandreed is not considered weedy or invasive. It is susceptible to a variety of foliage pathogens such as leaf mold (*Hendersonia calamovilfae*), leaf spot (*Septoria calamovilfae*), and rust (*Puccinellia* species).

Releases

'Goshen' was cooperatively released from the Montana PMC and the Montana and Wyoming Agricultural Experiment Stations (AES) in 1976, primarily for stabilization and range re-vegetation on sandy soils. It was increased without selection from a collection made in 1959, near Torrington, Wyoming. Goshen prairie sandreed produces a large amount of leafy biomass with excellent seed production. 'Pronghorn' was cooperatively released from the USDA-ARS, Nebraska AES, and the Kansas PMC in 1988. It is a composite of five, top performing accessions from Kansas and Nebraska. Pronghorn has good biomass production and a high degree of resistance to leaf rust. Koch Germplasm was cooperatively released from the Michigan PMC and the Michigan Association of Conservation Districts in 2007. It was selected for upright growth habit, general vigor, and seed production.

Additional Information

Seeding Rates and Recommended Cultivars. USDA-NRCS Plant Materials Technical Note Number MT-46. Available at <http://www.mt.nrcs.usda.gov/technical/ecs/plants/technotes/pmtechnoteMT46.html>

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

Grasses for the Northern Great Plains: Growth Patterns, Forage Characteristics, and Wildlife Values, Volume II Warm-Season; pg 53-57. USDA-NRCS and North Dakota State University Extension Service, R-1390.

Manual of Montana Vascular Plants. 2012. P. Lesica. Brit Press, Fort Worth, Texas.

A Field Guide to Wyoming Grasses. 2010. Q.D. Skinner. Educational Resources Publishing, Cummings, Georgia.

Native Grass Seed Production Manual. 1996. A Cooperative Publication of the USDA-NRCS Plant Materials Program, Ducks Unlimited Canada, and the Manitoba Forage Seed Association.