

PLANT MATERIALS TECHNICAL NOTE

BASIN WILDRYE *Leymus cinereus*: A Native Grass for Conservation Use in Montana and Wyoming

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Figure 1. Basin wildrye.

General Description

Basin wildrye is a large-statured, cool-season, native grass. Once established, it is an early, rapidly developing, robust bunchgrass with many basal leaves and short rhizomes. Basin wildrye has numerous, stiff, stout stems that elongate from growing points 10 to 12 inches above the crown. The leaves are up to an inch wide and 20 to 30 inches long. The large, spike-like seedheads grow up to 10 inches in length. Basin wildrye typically grows three to six feet tall reaching 10 feet under optimum conditions, and is very long-lived when grazing is properly managed.

Adaptation or Range

Basin wildrye has a broad climatic adaptation in areas receiving 8 to 20 inches annual precipitation at elevations of 1,900 to 9,000 feet. Basin wildrye is widely distributed on deep, well-drained soils of the prairies and foothills in the western United States and Canada. In lower precipitation regions it is found on sites with a higher water table.

In Montana, basin wildrye inhabits many riparian and wetland sites, including three coniferous forests, four deciduous forests, five willow and non-willow shrubs, and six sedge and non-sedge community types. Basin wildrye is a minor component of several grassland and shrubland habitat

types of western Montana. It is considered a climax species on more than 20 ecological sites in several Major Land Resource Areas (MLRAs). It is known to inhabit at least 37 of 56 Montana counties.

In Wyoming, basin wildrye is widely adapted across the seven geographic regions and is scattered throughout the 15 MLRAs. It is present on 64 ecological sites and a co-dominant grass on 48 of those sites in MLRAs 32, 34A, 43B, 47 UT, 58B, 61 and 67A. Basin wildrye is known to inhabit most of the counties in Wyoming, except those along the east side of the state.

Conservation Uses

Basin wildrye is used for spring and early summer grazing in dryland or sub-irrigated conditions. It greens up earlier in the spring than crested wheatgrass and produces abundant, palatable, and nutritious forage between the vegetative and soft dough seed stages. Basin wildrye is intolerant to repeated grazing below a height of 10 to 12 inches during the active growing season. Grazing during active growth severely damages the elevated growth point causing a decline in overall health and eventually causing plant death. After seed maturity, the plants can be grazed, cut for hay, or burned.

It retains good quality standing forage in the winter. The dry leaves, stems, and seedheads are palatable to cattle, horse, elk, bighorn sheep, and deer. Basin wildrye provides excellent protection for calving pastures, and cover for upland game birds and nesting waterfowl. Established stands are winter hardy and tolerant of drought, acid and saline impacted soils, and heavy-metal contamination. Basin wildrye is commonly included in native seed mixtures for conservation and reclamation plantings.

During flowering, basin wildrye produces large quantities of pollen over a long period of time. The pollen is a readily available food source for pollinating insects.



Figure 2. Honey bee gathering pollen from basin wildrye flower stalk.

Ease of Establishment

Basin wildrye is moderately easy to establish from seed. Seeding vigor is lower than other native grasses with stands established by the second or third growing season. The number of seeds per pound ranges from 106,000 to 150,000.

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 3.4 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 3.6 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. Basin wildrye should be planted on wide row spacing because of its large, mature stature. 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. Established stands of basin wildrye require careful management because they are intolerant of continuous and/or heavy grazing, especially when actively growing.

Basin wildrye has been field tested in trials across Montana and Wyoming since the 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.



Figure 3. Trailhead basin wildrye on a site near Pinedale, Wyoming.

Seed of basin wildrye is moderately easy to produce under cultivated conditions. Seed fields should be established in 36- to 48-inch spaced rows (3.5 and 3.0 pounds per acre, respectively) and cultivated to maintain in rows. Irrigated seed production with 80 pounds of nitrogen per acre applied in the fall yields 260 to 500 pounds of seed for five to seven years. Seed production is not recommended under dryland conditions. Seed fields can be swathed or direct combined when seed is in the hard dough stage. If direct combined, the seed must be dried prior to storage. The best harvest method is to swath the crop leaving a 30- to 36-inch stubble height and then combine the dried windrow. Seed maturity and quality is more uniform with this technique, although

processing is slow due to the high volume of dry material.. The average harvest date at the Bridger Plant Materials Center (PMC) is August 6. Basin wildrye is an obligate cross-pollinator.



Figure 4. Trailhead basin wildrye seed production field at the Bridger PMC.

Limitations

Grazing of newly established plantings should be delayed until after the fall of the second growing season. Basin wildrye seedheads are slightly susceptible to ergot fungus *Claviceps purpurea*, leaf rusts *Puccinia* spp., and infestations of black grass bug *Labops hesperiusorus*. It does not tolerate heavy shade or waterlogged soil. Basin wildrye is not considered weedy or invasive. Plant geneticists have identified two different sets of chromosome numbers in basin wildrye. Tetraploid ($2n=28$) populations are generally found east of the Continental Divide and in southern Idaho, Montana, Utah, Wyoming, and Arizona; the plants tend to be green to dark green in color. Octoploid ($2n=56$) populations are generally found in the northern Intermountain Region in Washington and British Columbia; the plants tend to be blue-green in color.

Releases

'Magnar' is an octoploid variety originating from Saskatchewan, Canada. It was cooperatively released from the Idaho PMC and the Idaho Agricultural Experiment Stations (AES) in 1979, primarily for use as forage for livestock and wildlife. 'Trailhead' is a tetraploid variety originating from Musselshell County, Montana. It was cooperatively released from the Bridger PMC and Montana and Wyoming AES in 1991, primarily for use as forage for livestock and wildlife. Washoe Germplasm originates from Deer Lodge County, Montana. It was cooperatively released from the Bridger PMC and Montana and Wyoming AES in 2002, primarily due to high tolerance of acid and heavy-metal impacted soils. 'Continental' is a hybrid of Magnar and Trailhead. It was cooperatively released in 2008, from the Utah Agricultural Research Service (ARS), Utah AES, and the PMCs in Montana and Colorado. It was developed for seedling and mature-plant vigor. The Utah Division of Wildlife Resources has targeted for release, Tetra Germplasm basin wildrye, a composite of 31 tetraploid accessions from the Great Basin. Its primary use will be to rehabilitate cheatgrass-infested sites and to improve sage-grouse habitat.

Additional Information

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

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