

MOUNTAIN BROME

Bromus marginatus Nees ex Steudel

Plant Symbol = BRMA4

Contributed by: USDA NRCS Idaho State Office



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Alternate Names

Bromus carinatus, California brome

Uses

Soil stabilization/erosion control: Mountain brome germinates and establishes quickly when seeded making it a good choice for quick cover of disturbed

sites such as highway right-of-ways, coal mine spoils, heavy metal mine tailings, spent oil shale and wildfire revegetation. It is a short-lived pioneer perennial species and when planted with slower developing native plants, provides excellent cover

crop attributes for the slower establishing species. It has good root production, especially when combined with a legume. Mountain brome roots decompose slowly providing long lasting erosion control even after the plants have died.

Wildlife: Mountain brome is an excellent plant for the revegetation of livestock and big game ranges in foothill and mountain locations. It is highly palatable in the spring providing good forage for wildlife and livestock. The leaves provide excellent grazing for elk, cattle and horses and are also eaten by sheep and deer. The seeds are readily eaten by small mammals and birds.

Grazing/livestock/pasture: Because mountain brome is a short lived perennial it should not be used for permanent pasture. Hay production levels drop after the third to fourth year as plants lose vigor and begin to die out. It can be used successfully, however, as a mixture component with slower developing long-lived perennial pasture species.

Legal Status

Consult the PLANTS Web site and your State Department of Natural Resources for status (e.g. threatened or endangered species, state noxious status, and wetland indicator values).

Taxonomy

There is debate concerning the proper placement of mountain brome in plant taxonomy. The California brome (*Bromus carinatus*) complex, to which mountain brome belongs along with foothills brome (*B. polyanthus*), is highly variable and taxonomists have named many taxa that can be viewed at a specific or subspecific level. Following the rules of botanical nomenclature, if *B. marginatus* is synonymous with *B. carinatus*, then *B. carinatus* has priority because that name was published by William Jackson Hooker and George Walker Arnott in 1840 (Hook. & Arn. Bot. Beechey's Voyage 403. 1840), while *B. marginatus* wasn't published until 1854 by Christian Gottfried Daniel Nees von Essenbeck, some fourteen years later (Nees ex Steudel, Syn. Pl. Glum. 1: 322. 1854). However, if they are to be seen as separate entities, then the group should be broken into the following three taxa as suggested by Cronquist et al (1977):

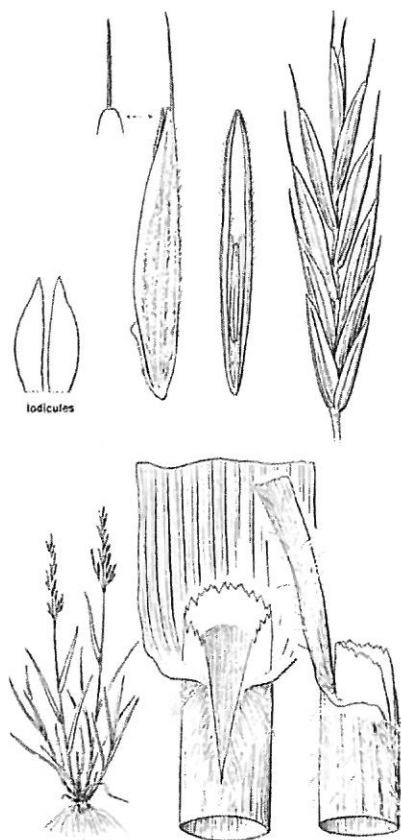
- 1 plants annual or biennial, 3-10 dm tall: awns usually > 7mm long *B. carinatus*

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Plant Fact Sheet/Guide Coordination Page <<http://plant-materials.nrcs.usda.gov/intranet/pfs.html>>

National Plant Data Center <<http://npdc.usda.gov>>

- 1 plants perennial, 8-12 dm tall; awns usually < 7 mm long
- 2 plants mostly pubescent throughout
B. marginatus
- 2 plants glabrous, at least in the spikelets
B. polyanthus



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Description

General: Grass Family (Poaceae). Mountain brome is a short-lived, perennial, cool season C-3 type bunch grass native to the mountain and intermountain regions of Western North America.

Plants develop from a shallow, non-rhizomatous root system. Culms are tall, usually 0.5 to 1.0 meters (20 to 40 inches), but sometimes reaching 1.5 meters (60 inches). Leaves are flat and broad, 4 to 10 mm wide (0.15 to 0.4 inches), mostly soft hairy, especially around the sheath, but can be glabrous or scabrous. Auricles are absent or much reduced, and the ligule is

membranous, from 1 to 4 mm (0.05 to 0.15 inches) long.

The inflorescence is a loosely contracted, nodding panicle reaching 10 to 30 cm (4 to 12 inches) long. Spikelets are 5 to 10 flowered, 20 to 40 mm (0.8 to 1.6 inches) long; the glumes lanceolate, strongly keeled. The first glume is 7 to 11 mm (0.3 to 0.45 inches) long with 3 to 5 nerves. The second glume is larger, 9 to 13 mm (0.35 to 0.5 inches) long and 5 to 7 nerved. Lemmas are long, 11 to 15 mm (0.45 to 0.6 inches), keeled with the apex slightly bifid to entire with awns 4 to 6 mm (0.15 to 0.25 inches) long.

Distribution

Mountain brome is common in the mountains and foothills of the Intermountain West. It is often found in relatively moist habitats in mountain big sagebrush, mountain shrub, aspen, and spruce-fir communities and up to sub-alpine mountain meadows.

For more information on distribution, please consult the plant profile page for this species on the PLANTS website.

Adaptation

Mountain brome is well adapted to the foothills and mountains of the Intermountain West in areas with sixteen inches or more annual precipitation. It can be found naturally at elevations ranging from 1,500 to 3,200 meters (5,000 to 10,500 feet) and has been tested at elevations as high as 3,000 meters (9,850 feet). It prefers deep, fertile, mesic soils of medium to fine textures, but also survives on thin, dry or coarse soils, resulting in lower levels of production.

Mountain brome does not tolerate flooding or high water tables but can tolerate very mild salinity. It is winter hardy and has good shade tolerance and fair tolerance to fire.

Establishment

Seed should be planted in a well-prepared, firm, weed-free seedbed in late fall or early spring. Spring plantings should not be later than May 15th in the mountain foothill zone or no later than June 1st in the mountain zone. Dormant fall plantings should be made no earlier than October 20th and preferably after November 1st.

Seed should be planted at ¼ to ½ inch depth. For pure stands the recommended drill seeding rate is 10 lb/ac.

For native mixtures limit mountain brome to 2 lb/acre to ensure slower developing species are allowed

adequate space for establishment. For erosion control plantings following wildfire, seeding rates should be 1.5 to 2.0 times the rates listed above (broadcast plantings should target 40 to 60 seeds per square foot).

This species is often seeded into rough terrain not easily transversed by equipment. In such cases mountain brome can be successfully broadcast seeded.

Management

Seedlings germinate in early spring (or fall under proper conditions) and plants mature by late June to early August. Moderate fall regrowth will occur with adequate soil moisture or when fall rains occur. Mountain brome has medium to rapid seedling vigor. However, mountain brome plants do not anchor their root systems rapidly, and plantings should be protected from grazing until a strong root system has established and plants are producing seed heads.

Weed control measures may be required during the establishment year.

Plants are fairly sensitive to grazing and should be managed carefully. Grazing utilization should be limited to 50% of the total annual growth.

Environmental Concerns

Although mountain brome is native to Western North America, it is sometimes considered "weedy" due to its ability to quickly establish in disturbed sites.

Please consult with your local NRCS Field Office, Cooperative Extension Service Office or state natural resource or agriculture department regarding this species' status and use. Weed information is also available from the PLANTS Web site.

Pests and Potential Problems

Mountain brome is known to be susceptible to head smut (*Ustilago bullata*); however 'Garnet' mountain brome has shown increased head smut resistance when compared to other mountain brome accessions. Fungicidal seed treatments have proven to be an effective means of further controlling head smut in mountain brome (see Hewitt, 1977) in seed production fields.

Mountain brome releases are resistant to stem rust, leaf rust, and leaf spot, but are susceptible to stripe rust and to aphid injury. Aphid injury typically occurs when mountain brome is grown in pure solid stands.

Seed Production

Drill seed in the fall as a dormant planting or in spring into a firm weed-free seed bed with soil moisture at field capacity.

Plant 5.0 pounds pure live seed (PLS) per acre at 36 inch row spacing or 25 to 30 PLS per foot of drill row. Soil surface should be kept moist throughout the two week germination period. Low rates of broadleaf herbicides should be applied when grasses are in the 3 to 5 leaf stage. Fertilization is not recommended during the first growing season unless indicated by a soil test.

Good soil moisture should be maintained throughout the growing season and post harvest. If sprinkler irrigated, plants should not be watered during flowering.

Seed is normally ready to harvest in late June to mid July of the second growing season. Harvest by direct combining or swather. Swathing with a temporary "diaper" (a heavy piece of plastic or canvas clipped under the belt draper) can minimize seed loss due to shatter.

Expected seed yields range from 300 lb/acre dryland to 600 to 1200 lb/acre irrigated for the first and second year of production. Third year yields are approximately 600 to 800 lb/acre. By the fourth year irrigated yields normally drop below 400 lb/acre.

Seed should be dried to 12 percent moisture or less before storing. Seed should be stored in a cool, dry environment. Under proper storage conditions seed will retain viability for 5 to 7 years.

Weed control measures may be required during the establishment year, and cultivation for maintenance of row culture is recommended for the life of the stand. Seed production fields should be regularly monitored for insects and disease. Soil tests should be conducted on seed production fields to determine the proper fertilization regimen, however only a moderate response to fertilization can be expected from mountain brome, and fertilization may stimulate weed growth and competition.

Releases

There are two registered varieties of mountain brome that have been released in the U.S., 'Bromar' and 'Garnet'. If, however, one takes a broader view of the taxonomy, one must also include two additional varieties of California brome, 'Cucamonga' and 'Deborah'.



Aberdeen PMC Display nursery plots of Bromar (left) and Garnet (right). Photo by Dan Ogle.

'Bromar' was chosen from among 154 accessions collected in the Pacific Northwest and was released in 1946 cooperatively by Washington, Idaho and Oregon Agricultural Experiment Stations at Pullman, Moscow and Corvallis. It was selected for being taller, leafier and having better seedling vigor than commercial strains. It shows outstanding performance when planted in mixtures with sweetclover or red clover for short pasture rotations. Tests have shown Bromar to be moderately resistant to head smut, but chemical seed treatment is recommended. Breeder seed is maintained by the NRCS Plant Materials Center in Pullman, Washington and Foundation seed is produced by the Washington Crop Improvement Association.

'Cucamonga' comes from the Mediterranean climate of California and was released in 1949 by California AES, Davis and the California NRCS Plant Materials Center. It has a short green period which limits its value as a forage plant, but it has been used successfully for erosion control and ground cover on droughty sites with low fertility. It is known to be susceptible to head smut, and therefore must be treated chemically.

'Deborah' was developed in Great Britain by combining two ecotypes, one from the UK and one from the South American Andes. It shows good drought tolerance, moderate resistance to smut and powdery mildew, but is susceptible to fruit fly.

Garnet Germplasm was released in 2001 by the Upper Colorado Environmental Plant Center in Meeker, Colorado and the Bridger Plant Materials Center in Bridger, Montana. The original collection came from a site near the town of Garnet in Granite County, Montana in 1976. Garnet shows improved seedling vigor, longer plant duration, extended seed

production and better resistance to head smut when compared to Bromar. Tested class seed is available from the UCEPC in Meeker, CO.

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IDAHO FESCUE

Festuca idahoensis Elmer

Plant Symbol = FEID

Contributed By: USDA, NRCS, Idaho and Washington State Offices, & the National Plant Data Center



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California Rangelands Native Grasses

Alternate Names

Bluebunch fescue

Uses

Grazing/rangeland/wildlife: Idaho fescue is a fair to good forage for all types of domestic livestock (Stubbendieck, J. et al., 1992). It is good year-around forage for elk and is grazed in spring by deer. Idaho fescue begins senescence later in the growing season than most other range plants. Therefore, it is particularly useful for late season grazing. The "Range Plant Handbook" prepared by the USDA, Forest Service includes a lengthy discussion on Idaho fescue use as rangeland forage (USDA, Forest Service, 1988). We reprint this discussion below.

"Idaho fescue is abundant and sometimes the dominant plant on extensive areas. It usually ranks with the choicest forage plants, and in Montana and possible elsewhere is, everything considered, probably the best forage grass. However, it may not quite merit first rank in palatability in some sections. It produces a fair amount of seed of comparatively high viability and maintains itself well on the range if given a reasonable opportunity. Idaho fescue excels many of its associated forage species in ability to withstand heavy grazing and trampling, although it will succumb to continued grazing abuse.

All classes of livestock relish it in the spring, as well as later in the season where it grows on north slopes or in cooler, moister sites and where the herbage remains tender. Under such conditions it is often grazed more closely than other associated grasses. As the season advances, the plants tend to become somewhat tough and harsh, and less succulent, with a proportionate decrease in palatability for sheep, especially ewes and lambs; to some extent this is true for horses and cattle also. However, if more inviting forage is not available, livestock will graze this species throughout the season and thrive. Moreover, the plant cures well on the ground and makes a good or very good fall forage, being readily grazed by all classes of livestock until late in the season, while it also produces a good aftermath, which is much relished. When accessible it is also a good forage for winter use."

Borman et al., (1991) compared eleven perennial grasses for their ability to suppress growth of resident annuals in southwest Oregon. Both Idaho fescue and 'Berber' orchardgrass (*Dactylis glomerata*), which begin growth early in the spring, suppressed annuals more effectively than grasses which initiate growth later in the spring. The grasses in this study, that initiated growth later in the spring compared to Idaho fescue and Berber orchardgrass, are California oatgrass (*Danthonia californica*), prairie junegrass (*Koeleria macrantha*), tall wheatgrass (*Thinopyrum elongatum*), intermediate wheatgrass (*Thinopyrum intermedium* 'Oahe'), tall fescue (*Lolium arundinacea*), perennial ryegrass (*Lolium perenne*), Rush intermediate wheatgrass (*Thinopyrum intermedium* 'Rush'), and orchardgrass (*Dactylis glomerata* 'Paiute'). The authors suggest that, for reseeding in the southern Oregon foothills, land managers should select grass species, which initiate the earliest spring growth, and maintain some growth through out the winter.

Moderate continuous grazing (33% current herbage used) did not reduce vigor of Idaho fescue in a 5-year grazing study (Ratliff and Reppert (1974). However, they further reported that continuous grazing unduly subjects the plants to heavy pressure during dry years. Jacobs and Sheley (1996) compared several Idaho fescue defoliation frequencies and defoliation levels (percents of aboveground biomass removed) for the ability of Idaho fescue to interfere with spotted knapweed (*Centaurea maculosa* Lam.) emergence and growth. As the Idaho fescue

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IDAHO FESCUE

Festuca idahoensis

Elmer

plant symbol = FEID

**Contributed By: USDA, NRCS, Idaho
 and Washington State Office**



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Service includes a lengthy discussion on Idaho fescue use as rangeland forage (USDA, Forest Service, 1988). We reprint this discussion below.

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Moderate continuous grazing (33% current herbage used) did not reduce vigor of Idaho fescue in a 5-year grazing study (Ratliff and Reppert, 1974). However, they further reported that continuous grazing unduly subjects the plants to heavy pressure during dry years. Jacobs and Sheley (1996) compared several Idaho fescue defoliation frequencies and defoliation levels (percent of aboveground biomass removed) for the ability of Idaho fescue to interfere with spotted knapweed (*Centaurea maculosa* Lam.) emergence and growth. As the Idaho fescue defoliation frequency and defoliation level decreased spotted knapweed emergence and growth also decreased. The authors suggest that moderate grazing intensity and infrequent grazing will

minimize spotted knapweed invasions by maximizing soil water use by Idaho fescue.

Idaho fescue produces an extensive deep root system. Therefore, it is an excellent erosion control grass for cutover forest areas (Hafenrichter et al., 1968). Plants that develop root-mycorrhizal associations are more tolerant of adverse soil conditions. Ho (1987) identified mycorrhizal Idaho fescue plants growing in an alkali dry lake bed. This alkaline environment (pH 9.2 to 10.5) is not a typical Idaho fescue habitat. Mycorrhiza inoculation may hold promise for increasing the vigor and range of adaptation of Idaho fescue.

Erosion control/reclamation: Idaho fescue is fairly drought resistant, stands are persistent, and it is adapted to stabilization of disturbed soils. It does not compete well with aggressive introduced grasses. Its drought tolerance, combined with extensive root systems and good seedling vigor, make this species ideal for reclamation in areas receiving 14 to 20 inches annual precipitation.

Status

Consult the PLANTS Web site and your State Department of Natural Resources for this plant's current status, such as state noxious status and wetland indicator values.

Description

Festuca idahoensis Elmer, Idaho fescue is a native, perennial, cool-season grass. Idaho fescue culms are erect, 0.3 to 1.0 m tall, glabrous and glaucous, sparsely leaved with most leaves basal. The fine narrow leaves usually have a bluish green to green color. The leaf sheaths are flattened, keeled, either glabrous or scabrous; the basal sheaths are short, open and wider than the blade. The sheath collars are indistinct and the auricles are either small or absent. The blades are

involute, 5 to 25 cm long, filiform, firm, elongate, scabrous, often glaucous, glabrous abaxially and pubescent adaxially. The ligule has a ciliate membrane, less than 2 mm long, and is truncate. The inflorescence is a panicle, 7 to 15 cm long, narrow, dense, with branches ascending and lower branches spreading. The spikelets are 4 to 7 flowered, 8 to 14 mm long, with rachilla joints visible; the lemma is 5 to 7 mm long, somewhat laterally compressed at maturity, and scabrous to glabrous. The lemma is awned from the tip, 2 to 5 mm long, and straight. The glumes are unequal, lanceolate and acute; the first glume is 1-nerved, 3 to 5 mm long; and the second glume faintly 5-nerved, 4 to 4.5 mm long. Idaho fescue begins growth early in the spring and its seeds mature by midsummer. It reproduces from both seeds and tillers.

Distribution

The range of Idaho fescue extends to California, Colorado, Idaho, Montana, Nevada, Oregon, South Dakota, Utah, Washington, and Wyoming. Idaho fescue is one of the most common and widely distributed grasses in the Western States. However, it is either rare or absent in the southern portions of the Southwest. For current distribution, consult the Plant Profile page for this species on the PLANTS Web site.

Adaptation

Idaho fescue occupies very diversified habitats. Collections show altitudinal variation in Idaho fescue habitat extending from 300 m to 4,000 m (984 ft. to 13,120 ft.). Although it may be found at any elevation between these extremes, it is most prevalent from about 1,524 to 2,439 m (5,000 to 8,000 ft.) in Montana, from 2,341 to 3,049 m (7,000 to 10,000 ft.) in Utah and Colorado, and from 915 to 2,341 m (3,000 to 7,000 ft.) in California and the Northwest.

It grows on all exposures and under a wide variety of soil conditions. It prefers silt loam or sandy loam soils and is occasionally found on loamy sand soils. Common habitats are exposed benchlands, hillsides and ridges, parks, meadows, forestlands, and open ponderosa and lodgepole pine stands. Idaho fescue is tolerant of weakly saline, weakly alkaline, and acidic soil conditions.

It has excellent cold tolerance, moderate drought tolerance, and moderate shade tolerance. It is not as drought tolerant as sheep fescue and its drought tolerance is similar to that of hard fescue. It is fairly tolerant of fire in autumn, but requires 2 to 3 years to fully recover after burning. It is not tolerant of high water tables or flooding. Its frequent associates include bluegrass, mountain brome, geranium, western yarrow, mountain big sagebrush, antelope bitterbrush, ponderosa pine, bluebunch wheatgrass and slender wheatgrass. In the mountains of Idaho, Montana, and Wyoming it seems to be replaced by bluebunch wheatgrass and needlegrass (*Hesperostipa*, *Nassella*) as moisture decreases or overgrazing increases.

Establishment

Natural establishment: Idaho fescue produces a fair amount of seed of comparatively high viability and maintains itself well on rangeland if given a reasonable opportunity (USDA, Forest Service, 1988).

Planting: One PLS pound of Idaho fescue seed contains approximately 425,000 to 460,000 seeds and a broadcast planting of one pound of Idaho fescue seed results in a seeding distribution of approximately 10.1 seeds per square foot (USDA, NRCS, 1996). The recommended pure stand seeding rate is 4 (PLS) pounds per acre for rangeland seedings. Planting 6 to 8 pounds per acre will provide dense cover for erosion control

(Ensign et al. 1984). Idaho fescue is normally recommended as a component in seeding mixtures with other native species.

Idaho fescue seed is not highly germinable compared to alternative forage or competing weeds (Evans and Young, 1972). Cold temperature (2 ° C constant) germination of 18 percent pales in comparison to cheatgrass, which had 76 percent germination under the same conditions (Evans and Young 1972, Young et al. 1981). Proper weed control coupled with good seedbed preparation is needed to achieve dense stands of Idaho fescue.

Idaho fescue initiates growth in March through April and matures in mid to late summer. With adequate moisture, Idaho fescue will produce a moderate amount of regrowth following seed maturity. Late fall plantings are most successful. Plant early in the spring if fall planting is not possible. Seeded stands require 2 to 3 years to establish, but are very competitive once established. Recommended planting depth is 0.25 to 0.50 inches in fine to medium-textured soil and no more than 0.75 inches in coarse- textured soil. Conduct a soil analysis before planting; if the soil test indicates less than 6 ppm of phosphorus, then apply 60 pounds per acre of P_2O_5 (Ensign et al. 1984). Idaho fescue does not require or respond to heavy nitrogen applications. Primary pests of Idaho fescue are grasshoppers, rodents and fungi that produce damping-off diseases of seedlings.

Management

Idaho fescue is susceptible to overgrazing. Idaho fescue should not be grazed by livestock during the growing season every 3 to 4 years. This will promote vigor and seed production and encourage the development of a strong root system, which is beneficial in reducing soil erosion and weed

competition. Also, deferred grazing during the growing season supplies dry forage for autumn and winter use.

At least 50 percent (by weight) of Idaho fescue annual growth should remain following grazing, or a stubble height of about 2 to 3 inches.

Following fire, protect Idaho fescue from grazing for two full growing seasons. Because palatability increases significantly following fire, an additional year's deferment may be needed to achieve full plant recovery and to re-establish a suitable stubble height. A less palatable residue is desirable to prevent livestock from grazing too closely.

Seed Production

Commercial seed production fields of Idaho fescue usually yield no seed the first (establishment) year, a limited amount of seed the second year, a large amount of seed the third year, and either a low or adequate amount of seed the fourth year (personal communication with Grasslands West Company, Clarkston, Washington, U.S.A.).

For seed production, plant Idaho fescue seed in early autumn in a firm, weed-free, fertile soil at a depth of 0.25 inches. Row spacing of 30 to 36 inches is recommended to facilitate weed control and rouging of off-types. Plant 4 PLS (pure live seed) pounds of seed per acre for these row plantings (Ensign et al. 1984).

Cultivars, Improved and Selected Materials (and area of origin)

Foundation and registered seed is available through the appropriate state Crop Improvement Association or commercial sources to grow certified seed.

Idaho fescue characteristically has poor seed production and weak seedling vigor (Hafenrichter et al. 1968). Therefore, the University of Idaho initiated a breeding program in 1950 to produce Idaho fescue cultivars with improved seed set, larger seed size (seedling vigor), and improved germination percentage.

The University of Idaho Agricultural Experiment Station developed two Idaho fescue cultivars '**Joseph**' and '**Nezpurs**' (Ensing, 1984). The experiment station released both cultivars for certification in 1983. Both Joseph and Nezpurs are synthetic cultivars selected through three cycles of phenotypic recurrent selection. The base population used for recurrent selection consisted of seed derived from inter-crossing 89 native ecotypes collected from northwestern states of the U.S. and Canada.

Joseph is a 13-clone synthetic cultivar. Joseph exhibited 18 percent better seed set, 37 percent larger seeds, and 14 percent better germination compared to the base population. "It has uniform, robust plants ranging from 72 to 80 cm in height. Joseph is 12 to 18 cm taller than 'Covar' sheep fescue (*Festuca ovina* L.) and approximately equal in height to 'Durar' hard fescue (*Festuca ovina* var. *duriuscula*) (Table 1).

The culms are erect with basal growth and produce 46 percent more forage production than Covar or Durar. Seed production of Joseph is 30 percent more than Covar, but 40 percent less than Durar" (Ensing, 1984).

'Nezpurs' is a 90-clone synthetic cultivar. Nezpurs exhibited 30 percent more seed set, 29 percent larger seed size, and 11 percent better germination than the original collections. Nezpurs is more variable than Joseph.

Both cultivars are adapted to Idaho, Washington, Oregon, Montana and Colorado rangeland and open forestland with elevation between 300 and 2700 m (984 to 8856 ft.) and annual precipitation between 35 and 76 cm (14 to 30 in).

Winchester Source Germplasm is a source-identified release that was made by Jerry Benson (Benson Farms Inc.). It originates from near Winchester, Idaho (approx. elev. 4000', ~18 in MAP). It is identical to P-6435, an accession collected and evaluated by the Pullman PMC. Winchester germplasm displays a fairly high degree of phenotypic variability because no effort was made to refine the germplasm by removing off-types. It is well suited for plantings that require germplasm that has not been genetically manipulated.

Table 1. Comparative data for 'Joseph' and 'Nezpurs' Idaho fescue with selected other fine leaf fescues.^ø

Cultivar - common name	Plant height	Growth habit	Maturity	Basal growth	Forage
-	-	-	-	-	-
	(cm)	(type)	(date)	(score)	(g)
Joseph - Idaho fescue	72 to 80	Erect ¹	5/11 ²	7.0 ³	718 ⁴
Nezpurs - Idaho fescue	55 to 70	Erect	5/10	6.3	194
Covar - sheep fescue	60 to 62	Very erect	5/12	6.0	68
Durar - hard fescue	62 to 75	Very erect	5/11	6.8	334
Cascade - chewing red fescue	80 to 85	Semi-erect	5/16	9.0	426
Dawson - creeping red fescue	55 to 68	Semi-erect	5/18	8.9	299

¹ At maturity.

² At 50 percent heading date.

³ 1=little, 9=abundant.

⁴ Representative space plants 1980-1981.

^ø Reprinted from Ensign et al. 1984.

Sources

Seed of 'Joseph' Idaho fescue is produced and sold by Grasslands West, Clarkston, Washington, U.S.A

Seed of 'Nezpurs' Idaho fescue is produced by David R. Mosman Ranch Inc., Mosman Road, Rt. 2 Box 43, Craigmont, Idaho, USA, (208) 937-2552.

Seed of Winchester germplasm Idaho fescue is produced and sold by Benson Farms Inc., 1145 Jefferson Ave, Moses Lake, WA, USA, (509) 756-6348

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Borman, M.M., W.C. Krueger, and D.E. Johnson. 1991. Effects of established perennial grasses on yields of associated weeds. *J. Range Manage.* 44:318-322.

Ensign, R.D. 1984. Registration of Joseph and Nezpurs Idaho Fescue. *Crop Sci.* 24:617-618.

Ensign, R.D., V.G. Hickey, and T.J. Bakken. 1984. Joseph and Nezpurs Idaho fescue: forage grasses for the Intermountain Northwest. Cooperative Extension Service, Current Information Series No. 736, University of Idaho Agricultural Experiment Station, Moscow.

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