

## IDAHO FESCUE

### *Festuca idahoensis* Elmer

Plant Symbol = FEID

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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 though 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

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**

Please 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**

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 western states. For current distribution, please 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. Exposed benchlands, hillsides and ridges, parks, meadows, forestlands, and open ponderosa and lodgepole pine stands are common habitats. 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, yarrow, mountain 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 (*Stipa*, *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 the range 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 3 to 4 (PLS) pounds per acre for range 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 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 (2C constant) germination 18%, pales in comparison to cheatgrass, which had 76% 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 will produce a moderate amount of re-growth 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 course textured soil. Conduct a soil analysis before planting; if the soil test indicates less than 6 ppm of phosphorus, and then apply 60 pounds per acre of P<sub>2</sub>O<sub>5</sub> (Ensign et al. 1984). Idaho fescue does not require or respond to heavy nitrogen applications.

### **Management**

Idaho fescue is susceptible to overgrazing. Idaho fescue should be left un-grazed by livestock through 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%, 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. An additional year's deferment may be needed to achieve full plant recovery, and to re-establish a suitable stubble height because palatability increases significantly following fire. A less palatable residue is desirable to prevent livestock for grazing too closely.

### **Pests**

Primary pests of Idaho fescue are grasshoppers, rodents and fungi that produce damping-off diseases of seedlings.

### **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' (Ensign, 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% better seed set, 37% larger seeds, 14% better germination compared to the original native ecotype collection. "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 46% more forage production than Covar or Durar. Seed production of Joseph is 30% more than Covar, but 40% less than Durar" (Ensing, 1984).

'Nezpurs' is a 90-clone synthetic cultivar. 'Nezpurs' exhibited 30% more seed set, 29% larger seed size, and 11% 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 (13.8 to 29.9 in).

'Winchester 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" 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 raw germplasm.

**Table 1. Comparative data for 'Joseph' and 'Nezpurs' Idaho fescue with selected other fine leaf fescues.**<sup>θ</sup>

Cultivar - common name	Plant height	Growth habit	Maturity	Basal growth	Forage
	(cm)	(type)	(date)	(score)	(g)
Joseph - Idaho fescue	72 to 80	Erect <sup>1</sup>	5/11 <sup>2</sup>	7.0 <sup>3</sup>	718 <sup>4</sup>
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

<sup>1</sup> At maturity.

#### 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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