

# Selection and Improvement of Idaho Fescue Germplasm for Turf Applications

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## Objectives:

1. Evaluate the turf quality and performance of Idaho fescue (*Festuca idahoensis*) accessions collected from the Intermountain West.
2. Evaluate the seed production potential of Idaho fescue accessions to confirm reproductive potential from seed.
3. Select superior individual plants of Idaho fescue and establish them in seed production blocks for use in development of improved synthetic cultivars with superior turfgrass quality.

**Start Date:** 2010

**Project Duration:** 3 years

**Total Funding:** \$9,000

A native of the northern Great Plains and Intermountain West, Idaho fescue (*Festuca idahoensis*) is a member of the *F. ovina* complex. Leaf color ranges from blue to dark green and both colors commonly co-exist in existing releases. Blue, glaucous leaf color has been associated with many plants adapted to high irradiation environments characteristic of the high altitude regions of the Intermountain West. Another key physiological characteristic to Idaho fescue's survival of low precipitation common in the Intermountain West is summer dormancy. These color and growth variations suggest that there is considerable room for Idaho fescue improvements.

In 2009, 42 accessions of Idaho fescue were acquired from industry and USDA seedbank sources. Twenty-six accessions were obtained from the USDA Plant Materials Center at Pullman, WA. Ten accessions were obtained from Benson Farms, two from the NRCS Plant Materials Center at Aberdeen, ID, and one each from Thorn Creek Native Seed, Currans Family Farm, and Seeds Trust. A final accession was a collection made by project personnel in the Island Park region of Idaho. Accessions were chosen specifically to represent ecotypes from a variety of ecological environments. Collection locales included sites in British Columbia, Alberta, Washington, Oregon, Idaho, Montana, and Wyoming.

In March 2010, seed of all 42 accessions were planted in plug trays in a greenhouse. After emergence, seedlings were thinned to a single plant per plug. Field planting occurred on May 17, 2010 when seedlings were approximately 3 inches tall. Of the initial 42 accessions, 36



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were established in the field. Two accessions from the USDA seedbank were misidentified and were species other than Idaho fescue. Four additional accessions had poor seed emergence and did not produce enough plants for plot establishment. For the 36 remaining accessions, 100 plants were established in the field. Plants were arranged in a randomized complete block with four replications of 25 plants.

The plot area was deep-tilled, packed, and fertilized with urea at 1 lb N/1,000 ft<sup>2</sup>. Plugs were irrigated every other day until new growth was evident, and subsequently on demand to avoid drought symptoms. The soil is a loamy-sand (CEC 12.2) with a pH of 8.0. Plots were mowed at 2.5 inches, irrigated to replace 75% to 80% of Kentucky bluegrass ET, and fertilized at 1 lb N/1000 ft<sup>2</sup> in the fall.

Accessions were evaluated on July 26 for growth and color variability, percentage of green individuals, growth habit (upright vs. decumbent), leaf texture and degree of dormancy. Three accessions

had 100% green plants, and another six accessions had greater than 50% green plants. Six accessions had zero green plants, and another 12 had less than 10%. Most accessions have the characteristic fine leaves of the *F. ovina* complex, with only one expressing broader than normal texture.

Five accessions showed a low level of summer dormancy with only a few plants showing partial dormancy, and another 17 accessions had plants expressing moderate levels of dormancy.

## Summary Points

- Thirty-six Idaho fescue accessions were established in the field.
- Accessions varied in number of green individuals, summer dormancy, and growth habit.
- Accessions showed similar leaf texture characteristic of other fine fescues.
- Field observations suggest good opportunity for turf-type Idaho fescue development.