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NOTICE OF RELEASE OF

OPPORTUNITY GERMPLASM NEVADA BLUEGRASS

SELECTED CLASS OF NATURAL GERMPLASM

| Shannon Majerus and Mark E Majerus

ABSTRACT

A selected germplasm of Nevada bluegrass (*Poa secunda* J. Presl [Poaceae]) has been released for use on severely impacted sites with moderately acidic to slightly alkaline soil pH and moderate to high soil concentrations of certain heavy metals. This germplasm has utility for reseeding burned forest lands to suppress weed growth, spring grazing, wildlife habitat enhancement practices, logging road revegetation, and general reclamation of mined lands.

Majerus S, Majerus ME. 2008. Notice of release of Opportunity Germplasm Nevada bluegrass: selected class of natural germplasm. *Native Plants Journal* 9(2):103–106.

KEY WORDS

Poa secunda, Poaceae

NOMENCLATURE

USDA NRCS (2008)

COLLABORATORS

USDA Natural Resources Conservation Service Bridger Plant Materials Center, Bridger, Montana; Montana Agricultural Experiment Stations, Montana State University, Bozeman; Wyoming Agricultural Experiment Stations, University of Wyoming, Laramie; and Deer Lodge Valley Conservation District, Deer Lodge, Montana



Species | *Poa secunda* J. Presl
Common Name | Sandberg bluegrass
Plant Symbol | POSE
Accession number | 9081633

Opportunity Germplasm Nevada bluegrass (*Poa secunda* J. Presl [Poaceae]), a selected class pre-varietal release, is now available for use in the intermountain foothills and mountains of Montana and Wyoming, with particular emphasis on areas characterized by low pH and contamination by heavy metals. As a selected class release, this selection will be referred to as Opportunity Germplasm Nevada bluegrass, USDA Natural Resources Conservation Service (NRCS) accession number 9081633

JUSTIFICATION

Justification for alternative release is based on a critical need for well-adapted plant materials for lime-amended acidic and heavy-metal contaminated sites in low to mid-mountain elevations in the foothills of central Montana and Wyoming. A lack of tested and adapted germplasm and the potential use of non-adapted seed sources further support selected class release. Additionally, this selection originates from a northern Rocky Mountain seed source that should prove well adapted to the conditions in the intended geographic area of use. Opportunity Germplasm Nevada bluegrass was selected for superior percentage stand cover, vigor rating, mean plant height, and biomass production relative to other *Poa secunda* accessions tested. Opportunity Germplasm Nevada bluegrass can also be used in other conservation applications such as post-fire reclamation, native range restoration, wildlife habitat enhancement, logging road revegetation, and mined land reclamation.

COLLECTION SITE INFORMATION

The original Opportunity Germplasm Nevada bluegrass (accession number 9081633) seed collection was made in 1998 near the Wisdom Junction along Highway 1, 1.5 km (0.93 mi) east of Anaconda, Montana. Seeds were collected from at least 10 individual plants. The collection site was severely contaminated with heavy metals from smelter fallout, surface wind, and water transport, as well as by historic overflow from the waste canal that supplied the Opportunity sediment ponds. Surface pH of the soil was 4.3. The original donor plants were found growing in association with slender wheatgrass (*Elymus trachycaulus* (Link) Gould ex Shinners [Poaceae]), redbtop (*Agrostis gigantea* Roth [Poaceae]), scarlet globemallow (*Sphaeralcea coccinea* (Nutt.) Rydb. [Malvaceae]), and western wheatgrass (*Pascopyrum smithii* (Rydb.) A. Löve [Poaceae]). Reshaping and replanting of the original site has occurred since the collection was made.



Collection site for germplasm used in developing Sandberg bluegrass.

DESCRIPTION

The present nomenclature for Sandberg bluegrass *Poa secunda* combines several previously distinct species: the *P. sandbergii*/*P. canbyi* type (short stature, early maturing, primarily basal leaves) and the *P. ampla*/*P. juncifolia*/*P. nevadensis* type (taller stature, late maturing, primarily cauline leaves). Although under the present nomenclature Opportunity Germplasm Nevada bluegrass is classified as *P. secunda*, it has the same general botanical (floral, foliage, and seed) and phenological attributes as the species previously classified as *P. nevadensis*. Opportunity Germplasm Nevada bluegrass is late maturing (unlike Sandberg and Canby bluegrass), has folded leaves (unlike big bluegrass type *P. ampla*), and long ligules (unlike the alkali bluegrass type *P. juncifolia*). This germplasm release has been given the common name of Nevada bluegrass to distinguish it from Sandberg bluegrass. In the Northern Great Plains and northern Rocky Mountain foothills and val-

leys the Nevada bluegrass type is a more robust and later maturing grass than the Sandberg bluegrass type, and therefore, is a more desirable reclamation species.

It is assumed Opportunity Germplasm traits are heritable and the progeny from the selection will appear and perform in a similar manner. Nevada bluegrass is a long-lived perennial bunchgrass. The donor plants of this selection reached a height of 61 to 122 cm (24 to 48 in) by early July. Opportunity Germplasm Nevada bluegrass reached a mean plant height of 62 cm (24 in) on the pH-adjusted test site in a 355-mm (14-in) precipitation zone 4 y after planting. Nevada bluegrass is a medium-stature, cool-season grass with basal leaves reaching 20 to 41 cm (8 to 16 in) in length and cauline leaves about half that length. Nevada bluegrass leaves are smooth, deep blue-green, and folded with keel-shaped tips typical of bluegrasses. The species inflorescence is a narrow panicle up to 20 cm (8 in) long.

METHOD OF SELECTION

Opportunity Germplasm Nevada bluegrass is being released as a “Natural-Track” germplasm, that is, increased without purposeful manipulation. This selection was compared with 2 *Poa secunda* seed sources collected from acid/heavy-metal impacted sites; accession number 9081635 collected on Stucky Ridge north of Anaconda, Montana, and accession number 9081322 originating in Marysville, Montana. Opportunity Germplasm was also tested against 2 released *Poa secunda* cultivars: ‘Canbar’ (Washington state) and ‘Sherman’ (collected in Sherman County, Oregon). Taxonomically, all 5 accessions are currently listed as *Poa secunda*, although some accessions were originally described as different and (or) distinct species. ‘Sherman’ big bluegrass was originally classified as *Poa ampla*. Accession number 9081635 and ‘Canbar’ were originally classified as *Poa canbyi*, whereas accession number 9081322 was originally classified as *Poa nevadensis*. All 5 collections were field tested for 4 y at one upland site in the Anaconda, Montana, area that was deep plowed and amended with lime. Opportunity Germplasm Nevada bluegrass exhibited superior seedling emergence, percentage stand cover, vigor rating, mean plant height, biomass production, and seedling and stand survival on lime-amended, acid/heavy-metal impacted sites under the ambient climatic conditions of the Upper Clark Fork Watershed (Deer Lodge County, Montana).

ECOLOGICAL CONSIDERATIONS

Nevada bluegrass is a long-lived cool-season perennial bunchgrass initiating growth (greens up) early in the spring and reaching maturity in early July. It is a prolific seed producer and is not weedy. Nevada bluegrass stands perpetuate them-

selves through seed shatter but should not be grazed heavily within the first 2 y of growth or the stand will deteriorate rapidly. The species is very tolerant to cold temperatures, although it does not do as well as other cool-season grasses under drought conditions. Light- to medium-textured soils with moist conditions and light are favored but must have good drainage for optimum performance and survival. It is very important that native reclamation species adapted to the Upper Clark Fork watershed be made commercially available for use on areas impacted by mining and smelting in the northern Rocky Mountain region. Opportunity Germplasm Nevada bluegrass passes the NRCS Plant Materials Program, Environmental Evaluation of Plant Materials Releases for potential invasiveness.

ANTICIPATED CONSERVATION USE

Opportunity Germplasm Nevada bluegrass is intended for use on severely impacted sites with moderately acidic to slightly alkaline soil pH. The selection can also tolerate moderate to high soil concentrations of certain heavy metals. Nevada bluegrass is used for reseeding of burned forest lands because of its ability to produce roots that suppress weed growth. Nevada bluegrass makes excellent spring grazing as well as cover and nesting grounds for upland game birds because of its early spring growth. Opportunity Germplasm Nevada bluegrass can also be used in other conservation applications such as post-fire reclamation, native range restoration, other wildlife habitat enhancement practices, logging road revegetation, and general mined land reclamation.

ANTICIPATED AREA OF ADAPTATION

Opportunity Germplasm Nevada bluegrass originated in the upper Clark Fork River basin of western Montana where a native stand was found growing on acidic soil impacted by acid/heavy-metal contamination resulting from historic copper smelter emissions and affected currently by wind and surface water erosion. The testing of this selection has been limited to the immediate area of its origin and at the Bridger Plant Materials Center in south-central Montana where it has performed well. Based on the performance data in the Stucky Ridge CEP, other nonreported field trials, and in its native range, Opportunity Germplasm Nevada bluegrass is best adapted to elevations of 610 to 1830 m (2000 to 6000 ft), performing less favorably on lower elevation (valley) sites. This selection should prove well adapted for use on drastically disturbed acidic and heavy-metal impacted areas of low to mid-mountain elevations in the northern Rocky Mountain region, given soil amendment and other favorable climatic condi-

tions. It is assumed that as a seed source found growing naturally in the northern Rocky Mountains, this selection will perform well in other mountainous regions of the Intermountain West with similar environments and climates. Opportunity Nevada bluegrass will continue to be tested across its geographic range to assess its performance and adaptation.

AVAILABILITY OF PLANT MATERIALS

Generation G₁ (Foundation) seeds of Opportunity Germplasm Nevada bluegrass will be available from the Bridger Plant Materials Center in Bridger, Montana, through the Foundation Seed Stocks Program at Montana State University–Bozeman or the University of Wyoming. Limited G₁ seed stock will be available in the spring of 2008. Commercial production of 2 generations (G₂ and G₃) beyond G₁ are allowed.

REFERENCE

[USDA NRCS] USDA Natural Resources Conservation Service. 2008. The PLANTS database, version 3.5. URL: <http://plants.usda.gov>. Baton Rouge (LA): National Plant Data Center.

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