Copperhead Germplasm slender wheatgrass

*Elymus trachycaulus* (Link) Gould ex Shinners

Copperhead Germplasm slender wheatgrass is a selected class pre-varietal germplasm released from the USDA-NRCS Bridger Plant Materials Center (PMC) in 2006.

**Description**

Slender wheatgrass is a short-lived, native perennial bunchgrass that acts as a pioneer species on disturbed sites. Individual plants of this germplasm are 24 to 40 inches (60 to 100 cm) tall, reaching mature heights by early July. Slender wheatgrass has mostly cauline (stem) leaves and does not develop dense basal foliage. Leaves are flat or rolled, 3 to 8 mm wide with prominent nerves on the upper surface and clasping auricles. At maturity, stems may turn reddish purple at the plant base, below the inflorescence. Copperhead Germplasm produces a narrow spicate inflorescence, with five to seven flowered spikelets that are strongly imbricate (overlapping like shingles). Slender wheatgrass has short anthers making it strongly self-pollinated. Seeds of this slender wheatgrass are awnless or awn-tipped (2 to 3 mm).

**Source**

Copperhead Germplasm slender wheatgrass (original accession 9081620) is from a collection of at least 20 plants originating approximately one-half mile north of the Montana Highways MT-1 and MT-569 intersection in western Montana. The collection site was severely impacted by mine smelter fallout, surface wind, and water transported contaminates, as well as historic overflow from the canal transporting waste material to the Opportunity Sediment Ponds. The original collection site, with an average annual precipitation of 13.9 inches and at 5,000-foot elevation, has since been reshaped and replanted.

Copperhead Germplasm slender wheatgrass is released as a "natural-track" germplasm and increased with no purposeful manipulation. The accession was compared to two other collections from acid/heavy metal impacted sites (9081621 at Stucky Ridge, north of Anaconda and 9078455 at Lulu Pass, Cooke City, Montana) and four released cultivars: ‘Pryor’ (Montana), ‘San Luis’ (Colorado), ‘Revenue’ (Canada), and ‘Highlander’ (Canada). Copperhead Germplasm has been field tested at three impacted sites (two deep plowed, one deep plowed and amended) in the Anaconda area and in a controlled greenhouse environment utilizing mine-contaminated soil. Copperhead Germplasm exhibited superior emergence, survival, and biomass production on amended acid and heavy metal impacted soil under the ambient climatic condition of the Upper Clark Fork River Watershed as well as on non-contaminated sites at the Bridger PMC.

**Conservation Uses**

Copperhead Germplasm slender wheatgrass is a perennial bunchgrass and a prolific seed producer. Slender wheatgrass is also a good forage crop, making high quality hay and grazing if utilized in early growth stages. Slender wheatgrass is recommended for erosion and reclamation uses because of its good seedling vigor and rapid establishment qualities providing quick plant cover in native species seed mixtures.

**Area of Adaptation and Use**

Copperhead Germplasm originated in the upper Clark Fork River basin of western Montana where it was growing on soil impacted by acid/heavy metal contamination, resulting from historic mining and copper smelter emissions. The area is currently impacted by both wind and surface water erosion. The testing of the accession has been limited to the
immediate area of its origin and at the Bridger Plant Materials Center in south-central Montana. Copperhead Germplasm is adapted for use on drastically disturbed acidic/heavy-metal-impacted areas in mountain valleys and low to mid-mountain elevations in the northern Rocky Mountain region.

At high elevations, Highlander slender wheatgrass may be better adapted, and in the short-grass prairie region, Pryor slender wheatgrass would be the preferred accession. Copperhead Germplasm, as with any slender wheatgrass, is best used in reclamation seed mixtures for its quick establishment and site stabilization.

Establishment and Management for Conservation Plantings
Copperhead Germplasm is intended for use on severely impacted sites with low pH and high concentration of heavy metals. The species is strongly self-pollinated and does not readily cross-pollinate with other slender wheatgrasses, nor hybridize with closely related wheatgrasses. However, slender wheatgrass will hybridize with foxtail barley (*Hordeum jubatum*), resulting in Macoun’s barley (*Elyhordeum macounii*).

Slender wheatgrass production fields are easy to establish with a conventional drill. Medium textured, well drained soils are preferred, but it can handle heavier soils. Spring planting is recommended at 6 pure live seed (PLS) pounds per acre for pure stands planted ¼ to ½ inch deep.

Ecological Considerations
Copperhead Germplasm will dominate a mix if it is more than 20% of the seed mix due to its rapid establishment and competitive nature. It does not tolerate shaded or waterlogged sites.

Seed and Plant Production
The average number of seeds per pound of commercially produced seed is 145,000, while wildland collected seed is 175,000 seeds per pound. The average date of harvest at the Bridger Plant Materials Center is July 14. Copperhead Germplasm, like other releases of slender wheatgrass, is susceptible to seed shatter, making this species moderately difficult to harvest or to get consistently high yields.

Availability
For seed or plant increase:
G1 (Foundation) seed of Copperhead Germplasm slender wheatgrass for commercial seed production is available by contacting the Montana Foundation Seed Program, Montana State University, Bozeman, Montana 59717, (406) 994-5687 or Wyoming Seed Certification Service, Powell, Wyoming 82435, (307) 754-9815. One generation (G2 equivalent to Certified) beyond G1 (equivalent to Foundation) is recognized.

For conservation use:
Copperhead Germplasm slender wheatgrass is available from the commercial seed market. A list of regional commercial seed producers can be obtained by contacting the Montana Seed Growers Association, Montana State University or the Wyoming Seed Certification Service and is available in USDA-NRCS Plant Materials Technical Note PM-33 *Plant and Seed Vendors for Idaho, Montana, Nevada, Eastern Oregon, Utah, Eastern Washington, and Wyoming*. Available at: [http://www.plant-materials.nrcs.usda.gov](http://www.plant-materials.nrcs.usda.gov).

Citation
For additional information about this and other plants, please contact your local USDA Service Center, NRCS field office, or Conservation District (<http://www.nrcs.usda.gov/>), and visit the PLANTS Web site (<http://plants.usda.gov>) or the Plant Materials Program Web site (<http://www.plant-materials.nrcs.usda.gov/>).

For more information, contact:
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