

# PLANT MATERIALS TODAY

A Quarterly Newsletter of the Montana-Wyoming Plant Materials Program

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This is a quarterly field office newsletter to transfer plant materials technology, services, and needs. The plant materials personnel will be featuring short articles on project results, new cultivar releases and establishment techniques, seed collection, and field planting needs, etc. All offices are encouraged to submit articles about plant material-related activities relative to plant performance, adaptation, cultural and management techniques, etc.

## Express Pipeline Planting Trials

In 1980, the Bridger PMC, with support funds from the Office of Surface Mining (OSM), started to assemble and evaluate plant materials adapted to areas receiving less than 10 inches (250 mm) of annual precipitation. The primary objective was to increase the number and diversity of species available for revegetating arid range and mining sites in Montana and Wyoming, and to evaluate techniques for successful establishment. The majority of the collections were made from native range sites in the Red Desert and the Big Horn Basin of Wyoming. All collections were evaluated at the Bridger Coal Mine near Point of Rocks, east of Rock Springs, Wyoming and at the Dresser Minerals bentonite mine near Greybull, Wyoming. The better performing collections of several species have undergone additional testing at the Bridger PMC and are now being increased to provide seed for large scale field testing.

The Express Pipeline is a 24 inch crude oil pipeline entering Montana at the Port of Wild Horse, passing through central Montana, entering Wyoming southeast of Bridger and proceeding through the Big Horn Basin and on to Casper, Wyoming. The disturbance created by the construction of the Express Pipeline provided an opportunity to test this new plant material in a variety of soil and plant community types in the arid Big Horn Basin. Four mixtures of native plants were formulated; one with species adapted to sandy soils, one adapted to heavy clay sites, one comprised of new releases and new test material, and one comprised of old reliable released cultivars. The primary plant material to be tested is 9078408 Sandberg bluegrass (origin Uinta, Natrona, and Johnson Co.s, WY), 9016134

Gardner saltbush (origin Washakie Co., WY), and 9019219 bottlebrush squirreltail (origin Washakie Co., WY). One test site was established at the Greybull Pump Station (clayey, saline upland site) southwest of Greybull and one on Banjo Flats (sandy, big sagebrush/needle and thread community) southeast of Worland. These trials are in cooperation with Express Pipeline, Excell Construction and the Bureau of Land Management.

Mark Majerus

## The Demand for Native Indigenous Plants

Revegetation, reclamation, and restoration--all imply the reestablishment of plant cover on a disturbed site, but if taken literally may imply three levels or intensities of site mitigation. 'Revegetation' is simply the reestablishment of a plant cover, often a monoculture of an introduced species. 'Reclamation' has been defined historically as the process of returning disturbed land to a condition that approximates the original site conditions and is habitable by the same or similar plants and animals which existed prior to disturbance. 'Restoration' strives to emulate the structure, function, diversity and dynamics of a specific predisturbance ecosystem. By utilizing topsoil salvage and native indigenous plant material, the genetic integrity and diversity of the natural plant communities will be maintained. Restoration must not be interpreted as a discrete event, but rather as an ongoing process involving the reestablishment of nutrient recycling, plant succession, and plant community dynamics.

The National Park Service, U.S. Forest Service, and some private conservation groups are taking the restoration approach in handling major disturbances. Instead of using introduced species or broadly adapted cultivars of native species, they are opting for ecotypes/genotypes that are indigenous to the specific site to be restored. This has created a demand for native seed harvests and small scale seed production to provide seed of specific ecotypes. The seed certification agencies have responded to this new demand by providing alternatives to the 'cultivar' release method; a method requiring extensive testing for an average

of 10 years. 'Source Identified' is the certification class of seed or plants from a naturally growing population occupying a known or defined geographic area. Seed for commercial sale may be collected from the wild stand or grown under cultivated conditions (time for release--immediately). 'Selected' is the certification class of seed or plants that have been through some testing, and that show some desirable superior trait or show promise of performance when compared with other accessions from similar sites (time for release 3-5 years). 'Tested' is the certification class of seed or plants which have been through additional testing on more than one generation which includes testing on multiple sites with replicated plots to verify performance and heritability of desired traits (time for release 5-7 years).

The old tried and tested native cultivars still play a very big role in conservation practices throughout the country, but now alternatives are available for those that are taking a more intensive, restoration approach to solving their conservation problems.

Mark Majerus

#### **PLANT PROFILE: Tufted hairgrass**

Our "Plant Profile" column is a new addition to the PMC newsletter featuring technical and practical information on plants with conservation applications. Initially, we will feature plants that are currently under study at Bridger, however, we will be glad to cover any species or cultivar upon request.

This Plant Profile describes a valuable native forage grass for livestock and wildlife, tufted hairgrass. Tufted hairgrass, *Deschampsia cespitosa* (L.) Beauv., is a bunch-forming, perennial, cool-season grass. The genus name commemorates Deschamps, a French physician and explorer of the eighteenth century. It is a circumboreal species found in distribution from Greenland to Alaska, on the east coast south to West Virginia, down to central Illinois and Minnesota, and across most of the west as far south as northern Mexico. In Montana, it is found on both sides of the Continental Divide (uncommon in the southeast) at mid-to-high elevations between 6,000 and 9,000 feet in valley bottoms, moist meadows, and stream terraces. It is found in annual precipitation zones as low as 15 to 18 inches, but distribution commonly occurs in zones with more than 30 inches of precipitation. It can grow in USDA Hardiness Zone 1, with average annual minimum temperatures less than -50° F through Zone 8a with average annual minimum temperatures between 15° and 10° F. It tolerates a wide range of soil pH, from 3.0 to 8.0, and soil types, including shallow, stony, poorly developed, deep, and poorly drained areas. This species has a high tolerance for sites

contaminated by the heavy metals aluminum, arsenic, cadmium, copper, lead, and zinc.

Plants have a dense, bunchy, erect growing habit with numerous stems varying in height from 2 to 4 feet. Leaves are bluish-green and similar to Kentucky bluegrass in size and shape, and have a marked swelling where the blade unites with the sheaf of the leaf. The inflorescence are open to contracted, nodding panicles 4 to 12 inches long. Spikelets are 2-flowered, shiny purplish-black to tawny in color and at maturity have a bicolor appearance. Because of this, it is also known as saltandpepper grass. In Montana and Wyoming, flowering occurs from early June to July and the small seeds ripen by late July to early August. Seed production in Logan, Utah and at the Bridger PMC was 250-300 lbs/acre. For an idea on the size of this tiny seed, there are approximately 2,400,000 in a pound! In comparison, there are approximately 92,000 seeds in a pound of 'Pryor' slender wheatgrass. It takes a large, productive stand of tufted hairgrass to collect a substantial amount of seed.

'Peru Creek', released in cooperation with the Upper Colorado Environmental Plant Center at Meeker, Colorado and 'Nortran', from the University of Alaska-Fairbanks, are the only commercially available cultivars on the market. In an attempt to get a more locally adapted ecotype of this species on the market, and in anticipation of the grant-funded project for the development of acid and heavy-metal tolerant species, the Bridger PMC established an initial evaluation planting in 1994. Twelve accessions of tufted hairgrass, three accessions of slender hairgrass, and one accession of Bering's tufted hairgrass were compared in plots in a study replicated three times. Plots are evaluated for percent survival, vigor, height, and seedhead production. The study will continue until 1998, at which time we will enter into the process of releasing a "source-selected" germplasm of tufted hairgrass.

A couple of quick notes about the importance of this species on native rangeland, mountain meadows, and disturbed mine sites. Tufted hairgrass is the dominant species in potentially the most productive grasslands in western Montana, and it is a facultative wetland species. It is considered to be excellent forage for cattle and horses and fair to good for a variety of wildlife. Forage production can be as high as 2,500 lbs/acre, with proper utilization up to 50 percent. In addition to the outstanding production of this native grass, it's adaptability to heavy-metal contaminated and acidic sites has the PMC excited about it's upcoming release and it's potential in solving important conservation problems in the Great Plains and Rocky Mountain region.

Susan R. Winslow

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